Amended Access Arrangement Information for the WA Gas Networks Gas Distribution Systems

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ABN 90 089531 975

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TABLE OF CONTENTS

1 ACCESS ARRANGEMENT INFORMATION FOR THE WAGN GDS

This document is the Access Arrangement Information for the WA Gas Networks Gas Distribution Systems (WAGN GDS) prepared pursuant to the National Gas Access Law.

In 2010, WAGN submitted an Access Arrangement Revision Proposal to the Economic Regulation Authority (ERA) under Rule 52, as required by section 132 of the National Gas Access Law. On [date], the ERA issued an Access Arrangement final decision, as required by Rule 62, in which it approved the Access Arrangement Revision Proposal and as a result a revised Access Arrangement then came into effect for the WAGN GDS.

In accordance with the requirements of Rule 42, this Access Arrangement Information is the information which is reasonably necessary for Users and Prospective Users to understand the:

- background to the Access Arrangement for the WAGN GDS; and
- the basis and derivation of the various elements of the Access Arrangement for the WAGN GDS.

1.1 Interpretation

Unless the contrary intention is expressed, words or phrases in this document have the same meaning as those defined in section 12 (Definitions and Interpretation) of the Access Arrangement for the WAGN GDS.

A reference in this document to:

earlier Access Arrangement Period means the Access Arrangement Period which preceded the Current Access Arrangement Period; and

initial Access Arrangement Period means the Access Arrangement Period which preceded the earlier Access Arrangement Period.

Where a word or phrase has not been defined in this document then, unless the contrary intention is expressed, the word or phrase is to be given the meaning prescribed in the National Gas Access Law, the National Gas Rules or the National Gas Regulations (as relevant).

Throughout this Access Arrangement Information, individual table entries may not add to the corresponding totals due to the rounding of those individual entries.

1.2 Compliance

Rule 72 sets out specific requirements for Access Arrangement Information relevant to revenue and price regulation. The specific requirements for Access Arrangement Information for an Access Arrangement Period which commences at the end of the

earlier Access Arrangement Period, are summarised in Table 1 of this Access Arrangement Information.

Information in respect of each of the specific requirements shown in Table 1 is provided in sections 3 to 15 of this document. Section 2 sets out, in accordance with the requirement of Rule 73, the basis on which financial information in presented in the document.

Table 1
Specific requirements for access arrangement information

NGR	Requirement
Rule 72(1)(a)	Expenditure and pipeline usage over the 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; and (iii) pipeline usage over the earlier Access Arrangement Period, in terms of minimum, maximum and average demand, and customer numbers in total and by tariff class.
Rule 72(1)(b)	Explanation of how the capital base is arrived at, and demonstration of how the capital base increased or diminished over the earlier Access Arrangement Period.
Rule 72(1)(c)	Projected capital base over the access arrangement period, and: (i) the basis for the forecast of conforming Capital Expenditure used in making the projection; and (ii) a demonstration of how the depreciation used in making the projection has been derived by applying the depreciation method set out in the access arrangement.
Rule 72(1)(d)	To the extent practicable, forecasts of pipeline capacity and of the utilisation of pipeline capacity over the access arrangement period, and the bases on which those forecasts have been derived.
Rule 72(1)(e)	A forecast of Operating Expenditure over the access arrangement period, and the basis on which the forecast has been derived.
Rule 72(1)(f)	Key performance indicators used to support expenditure to be incurred over the access arrangement period.
Rule 72(1)(g)	The rate of return, the assumptions on which the rate has been calculated, and a demonstration of how it has been calculated.
Rule 72(1)(h)	The method for dealing with taxation, and a demonstration of how tax has been calculated.
Rule 72(1)(i)	Efficiency gains or losses carried over as a result of the operation of an incentive mechanism in the earlier Access Arrangement Period.
Rule 72(1)(j)	The approach to the setting of tariffs, including: (i) the basis for the setting of Reference Tariffs, the method used to allocate costs, and a demonstration of the relationship between costs and tariffs; and (ii) a description of other pricing principles employed.
Rule 72(1)(k)	The rationale for the reference tariff variation mechanism.
Rule 72(1)(l)	The rationale for any incentive mechanism.
Rule 72(1)(m)	The total revenue to be derived from pipeline services for each year of the access arrangement period.

2 BASIS ON WHICH FINANCIAL INFORMATION IS PROVIDED [Rule 73]

Financial information in this document is provided on a real basis. All financial information is expressed in constant prices at December 2009 by escalating, where necessary, at the rate of inflation as measured by the Consumer Price Index (All Groups, Perth).

The values and forecasts of the Consumer Price Index shown in Table 2 have been used in expressing the financial information in this document in constant prices at December 2009.

Table 2
Consumer Price Index (All Groups, Perth) 2005-2009

	2004	2005	2006	2007	2008	2009
December quarter	143.3	149.0	155.5	160.2	166.2	169.7
June Quarter	141.0	146.3	153.2	158.0	165.1	167.4

For the period 2005 to 2009, financial data has been reported on a calendar basis. Escalation has been based on the June Consumer Price Index as this represents the mid-point of the year. For the period 1 January 2010 onwards, financial data is reported on a financial year basis. In this case, escalation has been based on the December Consumer Price Index as this represents the mid-point of the financial year.

3 EXPENDITURE AND PIPELINE USAGE OVER THE SECOND ACCESS ARRANGEMENT PERIOD [Rule 72(1)(a)]

3.1 Capital expenditure over earlier Access Arrangement Period [Rule 72(1)(a)(i)]

Capital Expenditure, by asset class, during the earlier Access Arrangement Period, is shown in Table 3.

Table 3
Capital expenditure by asset class 2005-2009
($ million, December 2009)

	2005	2006	2007	2008	2009
High pressure mains	0.535	1.629	1.629	3.301	10.510
Medium pressure mains	0.000	0.000	0.000	0.000	0.000
Medium/low pressure mains	8.163	9.036	13.357	11.926	8.742
Low pressure mains	0.000	0.000	0.000	0.000	0.000
Regulators	0.116	0.810	0.663	0.186	0.736
Secondary gate stations	0.000	0.000	0.000	0.013	1.680
Buildings	0.000	0.000	0.042	0.118	0.153
Meters and service pipes	19.127	22.228	19.673	17.550	19.287
Equipment and vehicles	0.000	0.000	0.000	0.000	0.000
Information technology	0.430	0.001	0.000	2.650	1.909
Full retail contestability	0.000	0.000	0.000	0.000	0.000
Land	0.000	0.000	0.000	0.000	0.000
Total	**28.371**	**33.705**	**35.364**	**35.743**	**43.017**

3.2 Operating expenditure over the earlier Access Arrangement Period [Rule 72(1)(a)(ii)]

Operating Expenditure, by category, during the earlier Access Arrangement Period, is shown in Table 4.

Table 4
Operating expenditure by category 2005-2009
($ million, December 2009)

	2005	2006	2007	2008	2009
Network	25.575	26.554	24.355	23.476	24.635
Marketing	0.332	0.367	0.351	0.239	0.401
Corporate	5.941	5.904	6.764	4.552	6.364
Information technology	5.029	4.970	5.335	3.109	3.806
Full retail contestability	1.275	1.266	1.308	1.330	1.975
Regulatory cost	1.111	1.196	1.341	3.102	4.042
Unaccounted for gas	3.626	3.659	4.496	6.482	6.189
Total	**42.889**	**43.914**	**43.951**	**42.289**	**47.412**

3.3 Pipeline usage over the earlier Access Arrangement Period [Rule 72(1)(a)(iii)]

Usage of the WAGN GDS during the earlier Access Arrangement Period is shown in Table 5 and Table 6. Table 5 shows minimum, maximum and average demand.

Table 5
Minimum, maximum and average demand 2005-2009 (TJ)

	2005	2006	2007	2008	2009
Minimum daily quantity	48	47	53	44	42
Maximum daily quantity	136	132	119	112	122
Average daily quantity	86	84	84	76	76

Customer numbers (including customers in receipt of prudent discounts), in total and by Tariff Class, are shown in Table 6. (WAGN GDS customers and Tariff Classes are explained in section 12.2 of this document.)

Table 6
Customers numbers by tariff class 2005-2009 (average for year)

	2005	2006	2007	2008	2009
Tariff Class A1	73	73	71	73	76
Tariff Class A2	93	97	96	98	100
Tariff Class B1	1,074	1,085	1,107	1,137	1,185
Tariff Class B2	5,989	5,813	6,220	6,677	7,249
Tariff Class B3	515,681	536,108	556,116	573,809	589,564
Total	**522,910**	**543,176**	**563,610**	**581,794**	**598,172**

4 OPENING CAPITAL BASE FOR CURRENT ACCESS ARRANGEMENT PERIOD [Rule 72(1)(b)]

In accordance with Rule 77(2), the Opening Capital Base for the Current Access Arrangement Period (the capital base at 1 January 2010) has been determined as:

- the Opening Capital Base for the earlier Access Arrangement Period;

plus:

- Conforming Capital Expenditure made, or to be made, during the earlier Access Arrangement Period; and
- amounts determined in accordance with Rule 82 (Capital Contributions by Users to new Capital Expenditure), Rule 84 (amount rolled in from speculative Capital Expenditure account), and Rule 86 (re-use of redundant assets);

less:

- depreciation over the earlier Access Arrangement Period; and
- redundant assets identified during the earlier Access Arrangement Period; and
- the value of pipeline assets disposed of during the earlier Access Arrangement Period.

In the determination of the Opening Capital Base for the Current Access Arrangement Period, the following have been escalated, at the rate of inflation as measured by the Consumer Price Index and expressed in constant prices at December 2009:

- the Opening Capital Base for the earlier Access Arrangement Period;
- Conforming Capital Expenditure made, or to be made, during the earlier Access Arrangement Period; and
- depreciation over the earlier Access Arrangement Period.

The Opening Capital Base for the earlier Access Arrangement Period, expressed in constant prices at December 2009, is shown in Table 7.

Table 7
Capital base at 1 January 2005
($ million, December 2009)

Asset Category	
High pressure mains	201.776
Medium pressure mains	257.304
Medium/low pressure mains	121.610
Low pressure mains	32.034
Regulators	11.450
Secondary gate stations	2.126
Buildings	1.928
Meters and service pipes	127.173
Equipment and vehicles	-3.423
Information technology	7.042
Full retail contestability	14.142
Land	6.801
Total	**779.962**

User contributions to Capital Expenditures during the earlier Access Arrangement Period are shown in Table 8. These contributions have been deducted from the appropriate Conforming Capital Expenditures for the purpose of determining the Opening Capital Base for the Current Access Arrangement Period.

Table 8
User Capital Contributions 2005-2009
($ million, December 2009)

	2005	2006	2007	2008	2009
Allocated to specific projects	0.000	0.050	1.329	0.036	1.151
Not allocated to specific projects	0.242	2.713	1.348	1.281	0.096
Total	**0.242**	**2.762**	**2.677**	**1.317**	**1.247**

No Capital Expenditure during the earlier Access Arrangement Period, in respect of which a Capital Contribution has been made by a User, has been added into the Opening Capital Base for the Current Access Arrangement Period.

During the earlier Access Arrangement Period:

- no amount has been withdrawn from a speculative Capital Expenditure account which should be added to the Capital Base in accordance with Rule 84; and
- there has been no re-use of redundant assets requiring an amount to be added to the Capital Base in accordance with Rule 86.

For the purpose of determining the Opening Capital Base for the Current Access Arrangement Period, depreciation of the Conforming Capital Expenditure made, or to be made, during the earlier Access Arrangement Period, is the forecast of depreciation made for the purpose of determining the Total Revenue and Reference Tariffs for the earlier Access Arrangement Period. This forecast of depreciation has been expressed in constant prices at December 2009 and is shown in Table 9.

Table 9
Depreciation 2005-2009
($ million, December 2009)

	2005	2006	2007	2008	2009
High pressure mains	2.019	2.025	2.033	2.042	2.049
Medium pressure mains	5.560	5.560	5.560	5.560	5.560
Medium/low pressure mains	3.425	3.569	3.708	3.831	3.969
Low pressure mains	1.186	1.186	1.186	1.186	1.186
Regulators	0.524	0.526	0.529	0.531	0.533
Secondary gate stations	0.112	0.112	0.112	0.113	0.113
Buildings	0.107	0.108	0.108	0.108	0.109
Meters and service pipes	12.165	13.099	13.997	14.699	15.523
Equipment and vehicles	0.000	0.000	0.000	0.000	0.000
Information technology	1.408	2.189	2.865	3.432	4.250
Full retail contestability	2.828	2.828	2.828	2.828	2.828
Land	0.000	0.000	0.000	0.000	0.000
Total	**29.336**	**31.204**	**32.928**	**34.330**	**36.121**

No redundant assets were identified during the earlier Access Arrangement Period.

Asset disposals recognised during the earlier Access Arrangement Period are detailed in Table 10.

Table 10
Asset Disposals ($million, December 2009)

	2005	2006	2007	2008	2009
Land					
Ballajura depot					2.366
Mt Claremont depot					0.754
Bentley office					0.308
Buildings					
Ballajura depot					0.575
Bentley office					0.466
Total					**4.470**

Prior to 2006, end-users in The Vines residential development were supplied with liquefied petroleum gas through a pipeline system. During 2006, a gas retailer converted all end-user appliances in The Vines for operation on Gas. The pipeline system, which was owned by WAGN's predecessor, was connected to the WAGN GDS.

WAGN added the capital value of The Vines pipeline system to the Capital Base of the WAGN GDS at the commencement of the Current Access Arrangement Period. WAGN has treated the capital value of The Vines pipeline systems as new Capital Expenditure incurred for the purpose of extending the WAGN GDS, and has treated the extension as part of the Covered Pipeline.

The capital value which WAGN attributed to The Vines pipeline system is the depreciated replacement cost of that system, which has been estimated to be $0.580 million.

The Opening Capital Base for the Current Access Arrangement Period is, in these circumstances, $788.354 million.

The way in which the Opening Capital Base for the Current Access Arrangement Period has been determined is demonstrated in Table 11.

Table 11
Opening capital base for Current Access Arrangement Period
($ million, December 2009)

	2005	2006	2007	2008	2009
Capital Base at 1 January	**779.962**	**778.998**	**781.499**	**783.935**	**785.349**
PLUS:					
Conforming Capital Expenditure	28.371	33.705	35.364	35.743	43.017
The Vines					0.580
Amounts determined in accordance with Rules 82, 84 and 86	0.000	0.000	0.000	0.000	0.000
	808.333	812.703	816.863	819.678	828.945
LESS:					
Depreciation	29.336	31.204	32.928	34.330	36.121
Amounts withdrawn from speculative Capital Expenditure account	0.000	0.000	0.000	0.000	0.000
Value of redundant assets	0.000	0.000	0.000	0.000	0.000
Asset disposals	0.000	0.000	0.000	0.000	4.470
	29.336	31.204	32.928	34.330	40.591
Capital value of Pipeline assets at 31 December	778.998	781.499	783.935	785.349	788.354

5 PROJECTED CAPITAL BASE [Rule 72(1)(c)]

The projected Capital Base for the Current Access Arrangement Period is, in accordance with Rule 78, to be determined as:

- the Opening Capital Base for the Current Access Arrangement Period; plus
- forecast Conforming Capital Expenditure for the Current Access Arrangement Period; less
- forecast depreciation for the Current Access Arrangement Period; less
- the forecast value of Pipeline assets to be disposed of in the course of the Current Access Arrangement Period.

The determination of the Opening Capital Base for the Current Access Arrangement Period is summarized in Table 11of this document. Forecast Conforming Capital Expenditure for the Current Access Arrangement Period is summarized in section 5.1, and forecast depreciation is summarized in section 5.2.

No Pipeline assets of material value are expected to be disposed of during the Current Access Arrangement Period.

5.1 Forecast Conforming Capital Expenditure [Rule 72(1)(c)(i)]

Table 12 shows forecast Conforming Capital Expenditure during the Current Access Arrangement Period.

Table 12
Forecast Conforming Capital Expenditure
($ million, December 2009)

	2010[1]	2010/11	2011/12	2012/13	2013/14
High pressure mains	9.577	4.168	7.008	10.663	10.289
Medium pressure mains	0.000	0.000	0.000	0.000	0.000
Medium/low pressure mains	6.426	11.544	12.114	12.057	12.665
Low pressure mains	0.000	0.000	0.000	0.000	0.000
Regulators	0.668	0.261	0.229	0.267	0.203
Secondary gate stations	2.006	0.424	0.000	0.000	0.000
Buildings	0.454	2.305	6.691	0.000	0.000
Meters and service pipes	9.115	21.524	24.440	24.321	25.140
Equipment and vehicles	0.000	4.472	0.000	0.000	0.637
Information technology	3.061	4.623	3.457	5.003	1.617
Full retail contestability	0.000	0.000	0.000	0.000	0.000
Land	0.000	0.000	0.000	0.000	0.000
Total	**30.307**	**49.321**	**53.939**	**52.311**	**50.551**

[1] 1 January 2010 to 30 June 2010 only.

Expenditures on Meters and Service Pipes are the largest component of forecast Capital Expenditure. These expenditures are, primarily, to facilitate the connection of the new customers shown in section 6 of this Access Arrangement Information.

Significant expenditures are also forecast for reinforcement of those parts of the WAGN GDS which will become capacity constrained during the Current Access Arrangement Period. The requirements for reinforcement have been determined using the volume and customer numbers forecasts shown in section 6 of this Access Arrangement Information, and from information from the Department of Planning and Infrastructure on the geographical expansion of the Perth metropolitan area.

As a prudent Service Provider, WAGN constructs Extensions or Expansions to the Pipelines as new areas are opened to urban and industrial/commercial development. Planning and pipeline construction when these new areas are “greenfields” sites facilitates efficient network expansion at the lowest sustainable cost. The additional costs once roads, buildings and other infrastructure are in place are high (they can double the total cost of Pipeline construction). The costs of this reinforcement work are, nevertheless, relatively high because land development is expected in areas which are not close to the existing high and medium pressure mains from which they will be supplied.

5.2 Forecast of depreciation [Rule 72(1)(c)(ii)]

For each of the classes of assets which comprise the WAGN GDS, forecast depreciation for the Current Access Arrangement Period has been derived using the straight line method.

The straight line method has been applied using the economic lives and, for the assets of the initial capital base, the remaining economic lives which are set out in Table 13.

Table 13
Asset lives for the derivation of forecast depreciation

	Economic life (years)	Remaining economic life of assets of initial capital base (years at 31 December 2009)
High pressure mains	120.0	95.0
Medium pressure mains	60.0	40.0
Medium/low pressure mains	60.0	30.0
Low pressure mains	60.0	22.0
Regulators	40.0	17.0
Secondary gate stations	40.0	14.0
Buildings	40.0	13.0
Meters and service pipes	25.0	0.0
Equipment and vehicles	10.0	-
Information technology	5.0	-
Full retail contestability	5.0	-

The forecast of depreciation for the Current Access Arrangement Period is shown in Table 14.

Table 14
Forecast of depreciation
($ million, December 2009)

	2010[1]	2010/11	2011/12	2012/13	2013/14
High pressure mains	0.89	2.242	2.276	2.335	2.424
Medium pressure mains	2.777	5.555	5.555	5.555	5.555
Medium/low pressure mains	2.147	4.384	4.577	4.778	4.979
Low pressure mains	0.593	1.186	1.186	1.186	1.186
Regulators	0.256	0.603	0.609	0.615	0.622
Secondary gate stations	0.075	0.204	0.215	0.215	0.215
Buildings	-0.015	0.053	0.105	0.272	0.272
Meters and service pipes	3.883	8.130	8.991	9.969	10.942
Equipment and vehicles	-3.423	0.585	0.650	0.650	0.650
Information technology	-5.437	1.455	2.371	3.062	3.838
Full retail contestability	0.000	0.000	0.000	0.000	0.000
Land	0.000	0.000	0.000	0.000	0.000
Total	**1.746**	**24.395**	**26.532**	**28.635**	**30.679**

[1] 1 January 2010 to 30 June 2010 only.

Table 15 provides a demonstration of how the forecast was derived. It shows the calculation of forecast depreciation for a single class of assets – high pressure mains.

Table 15
Example of calculation of depreciation
Medium/low pressure mains

Written down value of medium/low pressure mains at 31 December 2009:	$ million	Life years	Depreciation $ million/year		
▪ Medium/low pressure mains in initial capital base	100.642	30	100.642/30 = 3.355		
▪ Mediuml/low pressure mains installed from 1 January 2000	53.460	60	53.460/60 = 0.891		
	2010[1]	**2010/11**	**2011/12**	**2012/13**	**2013/14**
		($ million, December 2009)			
Forecast conforming CAPEX on medium/low pressure mains	5.426	11.544	12.114	12.058	12.665
Forecast depreciation on medium/low pressure mains in initial capital base	1.677	3.355	3.355	3.355	3.355
Medium/low pressure mains depreciation forecast calculation					
Forecast depreciation on medium/low pressure mains installed from 1 January 2000	0.469	0.939	0.939	0.939	0.939
Forecast depreciation on CAPEX:					
▪ 2010 CAPEX		0.090	0.090	0.090	0.090
▪ 2010/11 CAPEX			0.192	0.192	0.192
▪ 2011/12 CAPEX				0.202	0.202
▪ 2012/13 CAPEX					0.201
Forecast depreciation	**2.147**	**4.384**	**4.577**	**4.778**	**4.979**

[1] 1 January 2010 to 30 June 2010 only.

5.3 Projected Capital Base [Rule 72(1)(c)]

The determination of the projected Capital Base for the Current Access Arrangement Period is set out in Table 16.

Table 16
Projected Capital Base for Current Access Arrangement Period
($ million, December 2009)

	2010[1]	2010/11	2011/12	2012/13	2013/14
Capital base	**788.354**	**816.914**	**841.841**	**869.248**	**892.925**
PLUS:					
Conforming Capital Expenditure	30.307	49.321	53.939	52.311	50.551
	818.660	866.235	895.780	921.559	943.476
LESS:					
Depreciation	1.746	24.395	26.532	28.635	30.679
Forecast asset disposals	0.000	0.000	0.000	0.000	0.000
	1.746	24.395	26.532	28.635	30.679
Capital value of pipeline assets at end of year	816.914	841.841	869.248	892.925	912.796

[1] 1 January 2010 to 30 June 2010 only.

6 FORECAST UTILISATION OF PIPELINE CAPACITY [Rule 72(1)(d)]

The WAGN GDS is a system of non-contiguous Gas Distribution Pipelines and associated facilities located in the Perth metropolitan area (including Ellenbrook, Rockingham and Mandurah), and in a number of regional centres in the south west of Western Australia.

The regional centres in which the WAGN GDS is located are:

- Geraldton;
- Eneabba;
- Pinjarra;
- Harvey;
- Kemerton;
- Bunbury;
- Capel; and
- Busselton.

Discrete Distribution Pipeline segments, or Sub-networks, make up the WAGN GDS. At the date of this Access Arrangement Information, these comprise in excess of 12,000 kilometres of high pressure, medium pressure, Medium Pressure/Low Pressure Systems, and low pressure Gas Distribution Pipelines. Gas is delivered into each of these Sub-networks from 15 receipt points immediately downstream of meter stations on the Dampier to Bunbury Natural Gas Pipeline, and from one receipt point on the Parmelia Pipeline.

As a geographically dispersed system of non-contiguous Gas Distribution Pipelines, operating at different pressures, the WAGN GDS does not have a defined capacity, and making forecasts of system capacity is not practicable. Capacity utilisation can, however, be forecast, and the following forecasts of volumes of Gas delivered by Tariff Class, including volumes delivered to customers in receipt of prudent discounts, have been made for the Current Access Arrangement Period and are detailed in Table 17.

Table 17
Forecast volumes of Gas delivered (TJ)

	2010[1]	2010/11	2011/12	2012/13	2013/14
Tariff Class A1	6,029	11,947	12,165	12,680	12,900
Tariff Class A2	939	2,046	2,058	2,103	2,147
Tariff Class B1	747	1,694	1,748	1,802	1,856
Tariff Class B2	554	1,237	1,302	1,392	1,465
Tariff Class B3	4,613	10,709	10,830	11,154	11,486
Total	**12,882**	**27,634**	**28,103**	**29,131**	**29,854**

[1] 1 January 2010 to 30 June 2010 only.

Forecast customer numbers by Tariff Class (including customers in receipt of prudent discounts) are shown in Table 18.

Table 18
Forecast customer numbers by Tariff Class
(Average for year)

	2010[1]	2010/11	2011/12	2012/13	2013/14
Tariff Class A1	76	76	75	74	74
Tariff Class A2	101	102	105	108	111
Tariff Class B1	1,225	1,255	1,295	1,335	1,375
Tariff Class B2	7,683	7998	8,398	8,798	9,199
Tariff Class B3	601,025	613,354	631,063	649,973	669,332
Total	**610,109**	**622,785**	**640,936**	**660,288**	**680,091**

[1] 1 January 2010 to 30 June 2010 only.

WAGN engaged economics forecaster National Institute of Economics and Industry Research (NIEIR), and Western Australian consultant Economic Consulting Services, to assist with the preparation of the volume and customer numbers forecasts.

NIEIR's forecasting proceeds from its preparation of national economic projections, which are then the basis for State projections of industry output, investment, dwelling stock, and population growth. These State projections are disaggregated by statistical subdivision, and forecasts for the subdivisions are mapped to the areas supplied with Gas delivered through the WAGN GDS.

Volume forecasts for customers in Tariff Classes A1, A2 and B1 were developed on an industry basis. Industry regression models were used to forecast Gas use from:

- changes in industry outputs in the areas supplied with Gas delivered through the WAGN GDS; and
- changes in real Gas prices.

Forecasts for customers in Tariff Class B2 were generated from a model in which Gas sales were related to Gas prices, and to the total output of commercial enterprises in the areas supplied with Gas delivered through the WAGN GDS.

Residential Gas sales forecasts – forecasts for customers in Tariff Class B3 – were generated using a regression model in which average Gas sales per customer was related to:

- real household disposable income per capita; and
- real residential Gas prices.

Perth weather data indicate a strong trend of higher winter temperatures and, because Gas usage is temperature dependent, a weather correction must be made to the volume forecasts. This correction has been based on the long term decline in the number of heating degree days (HDD), which NIEIR has estimated to be at the rate of 3 HDD per year. Customers in the five Tariff Classes are not affected uniformly by temperature change, and a different temperature correction has been made for each Tariff Class.

NIEIR also sought to take into account in its forecasting an apparent decline in Gas usage by residential – Tariff Class B3 – customers. Comparative analysis showed that "new" customers used between 0.5 GJ and 1.0 GJ less than "old" customers. Given the relative low level of residential Gas use in Western Australia (around 17 to 18 GJ annually), this was a significant reduction. It was attributed to:

- the efficiency of water and space heating appliances; and
- the continued use of solar-electric hybrid hot water systems, and the increased usage of reverse cycle air conditioners in Western Australia.

NIEIR's forecasting models use as inputs, real Gas prices. These prices are expected to change in response to changes in Gas demand following the introduction of a national emissions trading scheme, which is expected to occur during the Current Access Arrangement Period. NIEIR has, therefore, sought to estimate the Gas price changes consequent upon implementation of an emissions trading scheme, and their effects on forecast Gas usage, based on the policy position presented in the Australian Government's December 2008 White Paper Carbon Pollution Reduction Scheme: Australia's Low Pollution Future. Although there were uncertainties surrounding the emissions trading scheme at the time proposed revisions to the Access Arrangement for the WAGN GDS were approved, it remains stated Government policy and its potential impact has been taken into account.

7 FORECAST OPERATING EXPENDITURE [Rule 72(1)(e)]

Forecast Operating Expenditure over the Current Access Arrangement Period is shown in Table 19.

Table 19
Forecast Operating Expenditure
($ million, December 2009)

	2010[1]	2010/11	2011/12	2012/13	2013/14
Network	20.716	27.470	28.228	28.403	27.852
Marketing	0.177	2.598	1.086	1.091	1.097
Corporate	3.983	7.966	7.966	7.966	7.966
Information Technology	2.791	5.956	6.167	5.839	6.210
Regulatory Cost	4.092	5.768	6.760	6.529	6.974
Unaccounted for Gas	4.878	10.465	10.643	11.032	11.306
Ancillary Reference Services	0.425	0.739	0.739	0.739	0.739
Total	**37.062**	**60.962**	**61.589**	**61.599**	**62.144**

[1] 1 January 2010 to 30 June 2010 only.

Operating expenditures have been forecast from a zero base and represent the lowest sustainable cost of providing the Reference Services.

Network cost inputs have been derived from the historical costs of undertaking maintenance and operating activities to meet existing regulatory and legislative requirements.

The forecast cost of unaccounted for Gas is based on Gas prices received as a result of a tender process.

Information and Communication Technology is sourced from an external service provider, and the forecast is based on the current costs of service. Forecasts of Information technology costs take into account the licence costs associated with current software applications and new applications forecast to be developed during the Access Arrangement period.

The forecast of corporate costs reflects the costs of corporate services sourced from an external provider and an allocation of costs incurred by WAGN in managing debt and equity portfolios, and in meeting corporate governance requirements.

Regulatory costs are forecasts of levies and Charges payable to external regulators based on forecasts provided by the external regulators and historical levels of expenditure.

Ancillary reference service costs are forecast costs of apply and removing Meter Locks, deregistration, and disconnection and reconnection of Delivery Points.

8 KEY PERFORMANCE INDICATORS [Rule 72(1)(f)]

Trends in a number of key performance indicators have been used as benchmarks against which the forecasts of Capital Expenditure and Operating Expenditures used in determining Total Revenue and the revised Reference Tariffs have been assessed for reasonableness. These indicators are:

- total Capital Expenditure per incremental customer connection;
- Operating Expenditure per kilometre of main;
- Operating Expenditure per GJ delivered; and
- Operating Expenditure per customer connection.

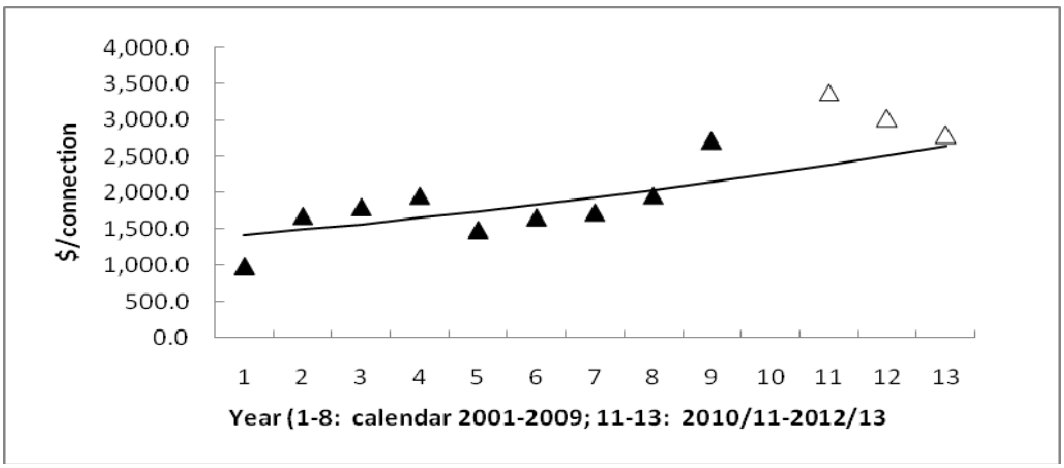
The trends in these indicators, and their projected values over the Current Access Arrangement Period, are shown in Figures 1 to 5.

Each of the indicators (past and forecast) is expressed in real, December 2009 dollars. The historical values (black triangles) are for calendar years 2000 to 2009. The forecasts (black outline triangles) are for the financial years 2010/11 to 2013/14. (No forecast is provided for the six months from 1 January to 30 June 2010.)

Figure 1 shows total Capital Expenditure per connection made during the year in which the Capital Expenditure is incurred. For some types of expenditure (for example, expenditure on high pressure mains), annual expenditures may allow new connections to be made for a number of years into the future. For other types of expenditures (for example, expenditures on medium pressure mains and Meters and Service Pipes - a large proportion of total Capital Expenditure), the expenditure is closely related to the number of new connections made each year.

The network infrastructure as outlined within the earlier Access Arrangement Period was approaching full utilisation. The continual geographic expansion of the Perth Metropolitan area which now stretches from Mandurah to Wanneroo has resulted in a corresponding spread of the WAGN GDS to cater to the demand for Gas connections in these areas. There is now a requirement to implement reinforcement of the network infrastructure to support both existing demand and further growth at the extremities of the current WAGN GDS footprint.

Figure 1
Total Capital Expenditure per (incremental) customer connection



The forecast above-trend increase in total Capital Expenditure per (incremental) customer connection is the result of planned reinforcement of the high pressure parts of the network to allow extension of the WAGN GDS as the Perth metropolitan area continues to grow.

Capital expenditures per (incremental) customer connection on medium and low pressure mains, and on Meters and Service Pipes, are forecast to continue to increase, but at rates at or below their long term trends (Figures 2 and 3).

Figure 2
Capital expenditure on medium and low pressure mains per (incremental) customer connection

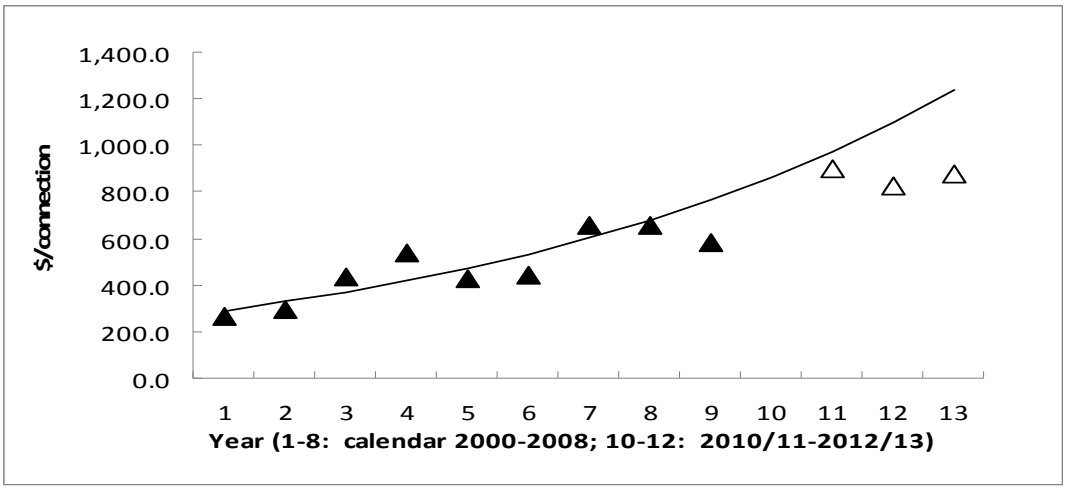
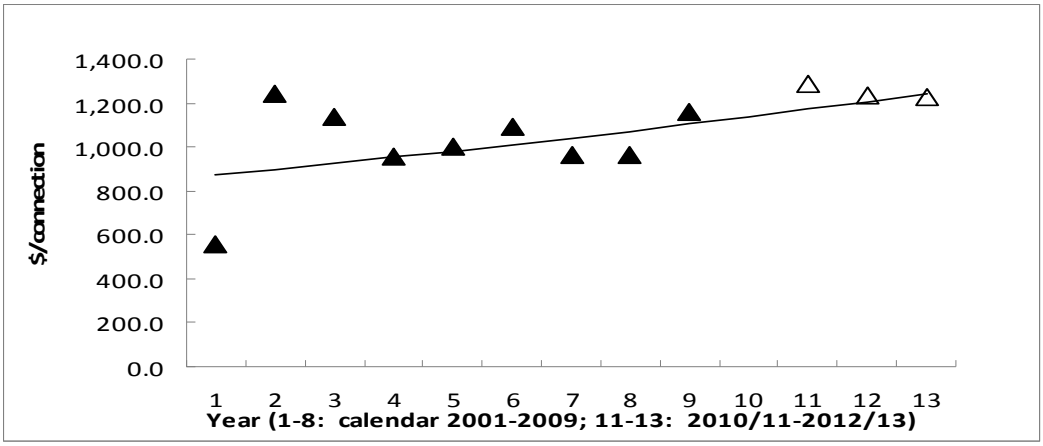
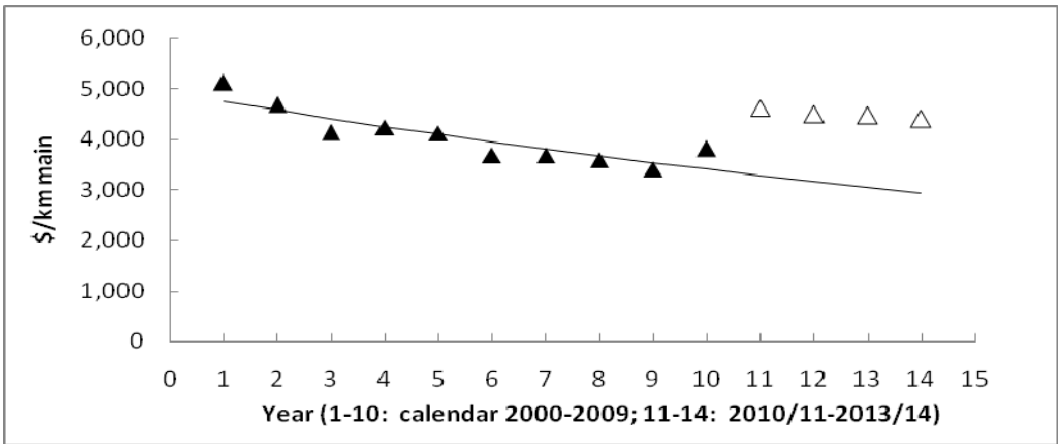


Figure 3
Capital expenditure on meters and service pipes per (incremental) customer connection



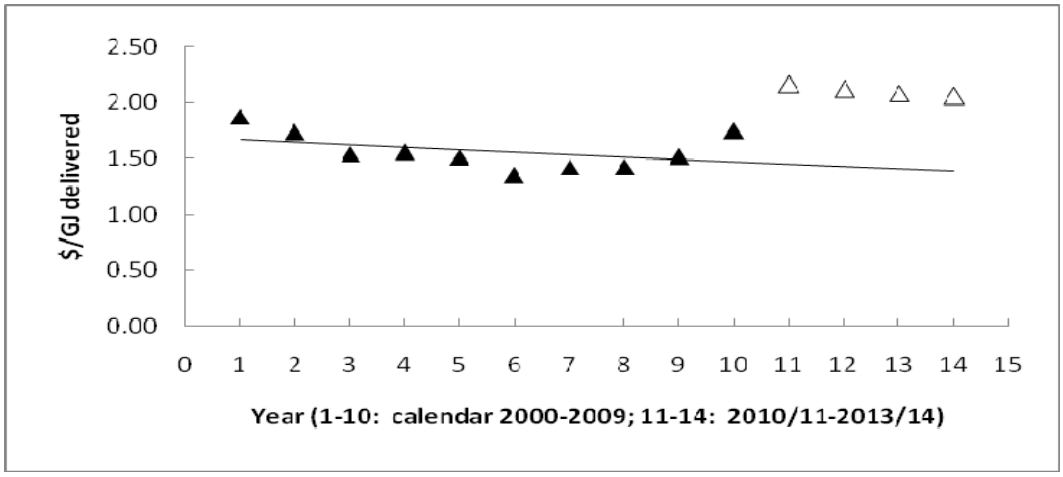
Operating expenditures per kilometre of main, per GJ of Gas delivered, and per customer connection are shown in Figures 4, 5 and 6. On all measures, Operating Expenditure during the access arrangement period is forecast to be above the declining long term trend.

Figure 4
Operating expenditure per kilometre of main



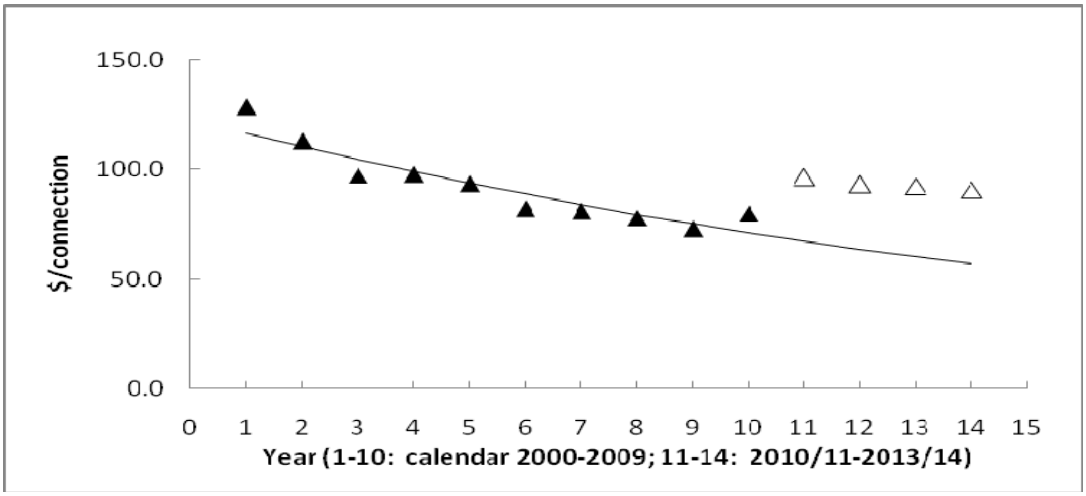
The expansion of the WAGN GDS has driven increases in operating costs to support required service standards such as fault response attendance within one hour. As it is now no longer possible to traverse the metropolitan area within this timeframe additional operational depots to facilitate ongoing network maintenance are required in more locations spread across the metropolitan area.

Figure 5
Operating expenditure per GJ of Gas delivered



Operating costs do not fluctuate with throughput and therefore the significant reduction in Gas demand experienced since the earlier Access Arrangement Period has a negative impact on the measures based on GJs delivered.

Figure 6
Operating expenditure per customer connection



Four factors contribute to the above-trend Operating Expenditures during the access arrangement period. These are:

- a significantly higher cost of Gas required to replace unaccounted for Gas as a result of significantly higher prices in a new Gas purchase contract;
- significantly higher regulatory costs, in part attributable to the new Gas regulatory regime of the National Gas Law and the National Gas Rules, and in part due to the

cost of complying with new regulatory obligations including the Energy Safety Levy (which was introduced during the earlier Access Arrangement Period);

- higher corporate costs (largely labour costs) allocated to WAGN as the group of companies to which WAGN belongs has been restructured; and
- labour costs have continued to increase due to recruitment and retention requirements in a Perth labour market stimulated by substantial activity across the resources sector.

When the effects of these four factors are removed from the forecasts (and from the "actuals" for 2005 to 2009), forecast Operating Expenditures are approximately unchanged for those during the last five years. This is shown in Figures 7, 8 and 9.

Figure 7
Operating expenditure per kilometre of main 2005-2013/14 (regulatory costs, corporate costs and costs of unaccounted for Gas excluded)

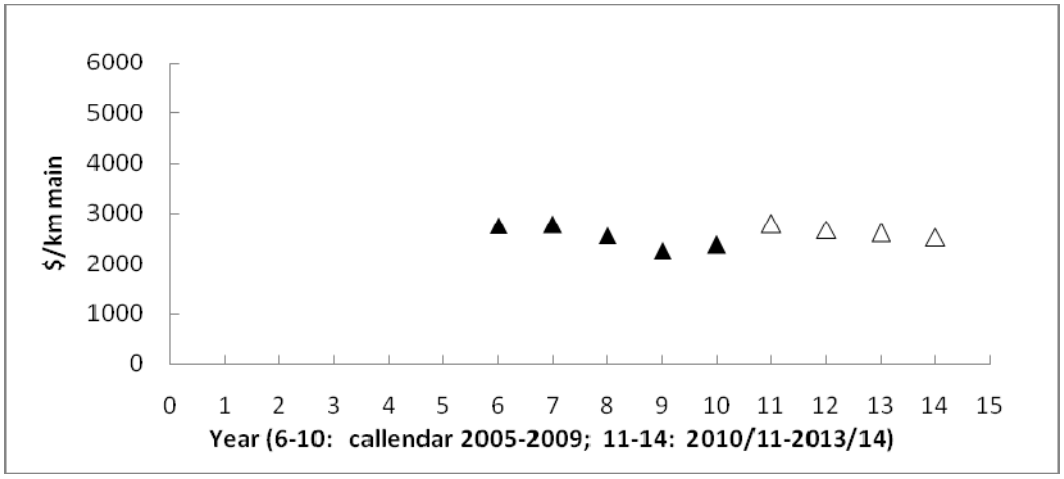


Figure 8
Operating expenditure per GJ of Gas delivered 2005-2013/14 (regulatory costs, corporate costs and costs of unaccounted for Gas excluded)

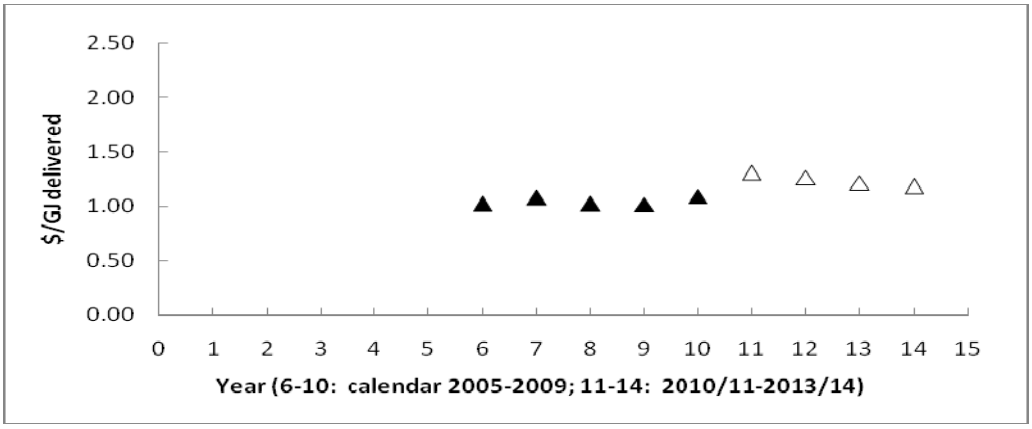
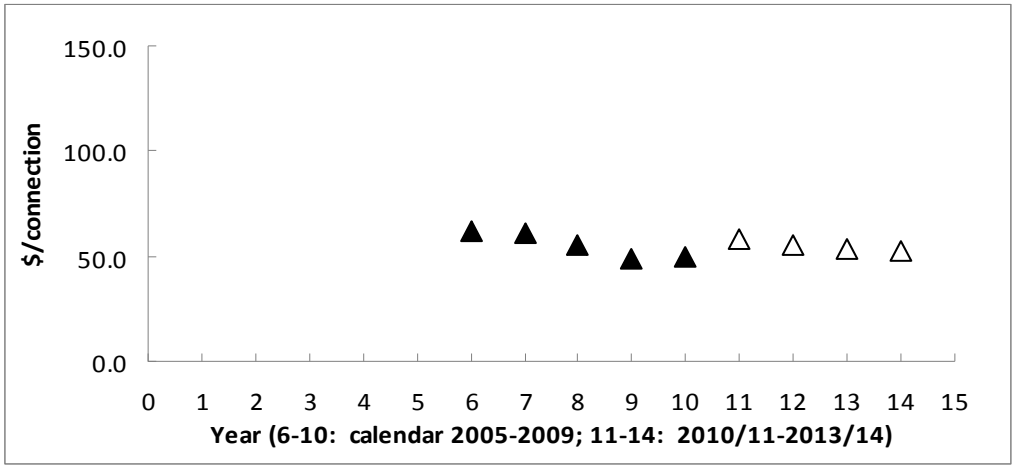


Figure 9
Operating expenditure per customer connection 2005-2013/14 (regulatory costs, corporate costs and costs of unaccounted for Gas excluded)



9 RATE OF RETURN [Rule 72(1)(g)]

Rule 87(1) sets out the criterion for the Rate of Return which is to be used in determining Total Revenue and Reference Tariffs:

The rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risks involved in providing Reference Services.

A Rate of Return which is commensurate with prevailing conditions in the market for funds and the risks involved in providing the Reference Services is not directly observable, and must be determined through a process of estimation and the exercise of judgement. Rule 87(2) guides the process of estimation and the exercise of judgement required in determining the Rate of Return:

In determining a Rate of Return on capital:

(a) it will be assumed that the service provider:

(i) meets benchmark levels of efficiency; and

(ii) uses a financing structure that meets benchmark standards as to gearing and other financial parameters for a going concern and reflects in other respects best practice; and

(b) a well accepted approach that incorporates the cost of equity and debt, such as a Weighted Average Cost of Capital, is to be used; and a well accepted financial model, such as the Capital Asset Pricing Model, is to be used.

9.1 Real, pre-tax WACC: approach

A nominal pre-tax weighted average of the costs of equity and debt has been calculated using the formula:

$$WACC_{\text{nominal post-tax}} = E(r_e) \times 1/[1 - t \times (1 - \gamma)] \times E/V + E(r_d) \times D/V,$$

where:

- $E(r_e)$ is the nominal post-tax expected rate of return on equity;
- E/V is the proportion of equity in total financing;
- $E(r_d)$ is the nominal pre-tax expected rate of return on debt;
- t is the tax rate;
- γ (gamma) is the proportion of tax collected at the corporate level which is to be credited against personal tax payments (γ is a measure of the value of imputation credits); and
- D/V is the proportion of debt in total financing.

A real pre-tax WACC has been obtained by removing expected inflation from the nominal pre-tax WACC:

$WACC_{real\ pre\text{-}tax} = (1 + WACC_{nominal\ pre\text{-}tax})/(1 + \pi^{e}) - 1.$

The cost of equity has been calculated using the CAPM:

$E(r_e) = r_{rf} + [E(r_m) - r_{rf}] \times \beta.$

The cost of debt ($E(r_d)$) has been calculated using the financial model:

$E(r_d) = r_{rf} + DRP + \kappa,$

where:

- r_{rf} is the nominal risk free rate of return;
- DRP is the debt risk premium; and
- κ is an allowance for debt raising costs.

9.2 Estimates of parameters

Calculation of a real, pre-tax WACC using the approach and financial models represented by the formulae above requires estimates of:

- nominal risk free rate of return;
- market risk premium;
- equity beta;
- debt risk premium;
- debt raising costs;
- tax rate;
- gamma;
- gearing; and
- expected inflation.

The estimates which WAGN has made are set out in Table 20.

Table 20
Parameter estimates for calculation of a real, pre-tax WACC

Parameter		Estimate
Nominal risk free rate of return	r_{rf}	5.02%
Market risk premium	$E(r_m) - r_{rf}$	6.50%
Equity beta	β	0.80
Debt risk premium	DRP	4.10%
Debt raising costs	κ	0.29%
Tax rate	t	30.00%
Gamma	γ	0.20
Gearing: debt to total value	D/V	60.00%
Gearing: equity to total value	E/V	40.00%
Expected inflation	π^e	2.60%

9.3 Calculation of real, pre-tax WACC

Cost of equity:

$$E(r_e) = r_{rf} + [E(r_m) - r_{rf}] \times \beta$$
$$= 5.02\% + 6.50\% \times 0.80$$
$$= 10.22\%$$

Cost of debt:

$$E(r_d) = r_{rf} + DRP + \kappa$$
$$= 5.02\% + 4.10\% + 0.29\%$$
$$= 9.41\%$$

Nominal pre-tax WACC:

$$WACC_{nominal\ pre\text{-}tax} = E(r_e) \times 1/[1 - t \times (1 - \gamma)] \times E/V + E(r_d) \times D/V$$
$$= 10.22\% \times 1/[1 - 30.00\% \times (1 - 0.20)] \times 40.00\% + 9.41\% \times 60.00\%$$
$$= 11.03\%$$

Real pre-tax WACC:

$$WACC_{real\ pre\text{-}tax} = (1 + WACC_{nominal\ pre\text{-}tax})/(1 + \pi^e) - 1$$
$$= (1 + 11.03\%)/(1 + 2.60\%) - 1$$
$$= 8.21\%$$

A real, pre-tax WACC which complies with the applicable requirements of Rule 87(2) of the NGR is 8.21%.

9.4 Satisfying the criteria of Rule 87(1)

Is the real, pre-tax WACC of 8.21%, obtained through a process of estimation and judgement guided by Rule 87(2), the rate of return required by Rule 87(1)? Is it commensurate with prevailing conditions in the market for funds and the risks involved in providing the reference services?

Some elements of the process of estimation and calculation through which the real, pre-tax WACC has been obtained, are commensurate with prevailing conditions in the market for funds in the sense that they have been estimated using current financial market data. Other elements of the process of estimation and calculation are not values determined by conditions in financial markets, and are not meaningfully assessed for commensurability with prevailing conditions in those markets.

9.5 Applying Rule 87(2): Nominal risk free rate of return

The nominal risk free rate of return used in calculating the real, pre-tax WACC of 8.21% was estimated using current financial market data. It was estimated as the average of daily yield data, reported by the Reserve Bank of Australia for the 20 trading days to 30 September 2010, for Australian Government securities with terms to maturity of 10 years. The result, 5.02%, is commensurate with prevailing conditions in the market for funds.

9.6 Applying Rule 87(2): Market risk premium

A market risk premium of 6.50% has been assumed.

The market risk premium is the difference between the expected rate of return on a market portfolio, and the risk free rate of return.

The market risk premium is not the difference between the realised or actual rate of return on the market portfolio and the risk free rate of return, although this difference - the historical excess return - may be used to make an estimate of the market risk premium.

In estimating the market risk premium in the context of determining the rate of return for the WAGN GDS, consideration must be given to the questions of what factors might determine the premium, whether those factors have changed and, if they have changed, how the market risk premium might respond to the changes. Consideration must be given to:

- the fact that market risk premium is not well understood (and remains a "puzzle" some 25 years after being given that designation by Mehra and Prescott);[1] and
- there were major changes in global financial markets (Global Financial Crisis) during 2007 and 2008.

[1] Rajnish Mehra and Edward C Prescott (1985), "The Equity Premium: A Puzzle", Journal of Monetary Economics, 15 145-161.

Prior to the Global Financial Crisis, economist Martin Weitzman observed, in the context of an examination of the market risk premium:

. . . markets are behaving as if investors fear some unknown hidden randomness that isn't obvious from the data. People are acting in the aggregate like there is much more marginal-utility–weighted subjective variability about future growth rates than past observations seem to support.[2]

Then came the Global Financial Crisis. The fears to which Weitzman referred were realised, and it is reasonable to expect that expectations adjusted. That adjustment, as Weitzman made clear, will not be obvious from past observations. Long term historical averages, commonly used to estimate the market risk premium, tell us nothing about those expectations and the way in which they have adjusted. Furthermore, any indications which might have been provided by past adjustments to "crises" have been "smoothed out" by the averaging process.

Evidence which was available - but not for Australian financial markets - indicated that the adjustment process was likely to be slow: in the order of 3.5 years.[3] In these circumstances, taking the long term historical average as an estimate of the market risk premium during for the next access arrangement period - during a period when the expectations are continuing to adjust to the effects of the Global Financial Crisis, cannot - and does not - lead to a rate of return which is commensurate with prevailing conditions in the market for funds.

An alternative method of measuring the market risk premium is required - a method which adopts a forward-looking view and is able to capture expectations over the next access arrangement period. Value Advisor Associates provided such an estimate for WAGN using its so called Implied Volatility Approach.

WAGN has therefore retained a value of the market risk premium above the long term average, but below the value which was used in the access arrangement revisions proposal submitted on 29 January 2009, and which was based on data from the immediate aftermath of the Global Financial Crisis.

Unlike the long term historical average, WAGN's estimate of the market risk premium of 6.50% is indicative of current conditions in the market for funds.

9.7 Applying Rule 87(2): Debt risk premium

In assessing the rate of return, WAGN has used a debt risk premium of 4.10%. That premium was estimated using current financial market data: it is commensurate with prevailing conditions in the market for funds.

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2 Martin L Weitzman (2007), "Subjective Expectations and Asset-Return Puzzles", American Economic Review, 97(4): 1102-1130.

3 Carmen M Reinhart and Kenneth S Rogoff (2009), "The Aftermath of Financial Crises", American Economic Review Papers and Proceedings, 99(2): 466-472.

Data for the estimation of a debt risk premium are no longer available from the CBASpectrum service. WAGN's debt risk premium of 4.10% has been estimated primarily from the premium implicit in the Bloomberg BBB band fair value curve for 6 years duration. The Bloomberg fair value curve has been extrapolated using the change in the premium obtained from the Bloomberg AAA fair value curves for 6 years and 10 years.

9.8 Applying Rule 87(2): Debt raising costs

An allowance for debt raising costs comprises:

- 12.5 basis points for debt facility establishment costs; and
- an annualised allowance of 16.3 basis points for recovery of "pre-financing" costs.

9.9 Applying Rule 87(2): Gamma

A value of gamma of 0.20 has been used. This value of gamma is commensurate with prevailing conditions in the market for funds.

9.10 Applying Rule 87(2): Cost of equity

The real, pre-tax WACC of 8.21% was determined using the CAPM to estimate the cost of equity. Applying the CAPM yielded a (nominal, post-tax) return to, or cost of, equity of 10.22%.

To ascertain whether this cost of equity was commensurate with conditions in the market for funds and the risks involved in providing the reference services WAGN:

- examined the equity returns obtained from a number of alternative asset pricing models; and
- engaged finance consultants SFG to estimate the return on equity which prospective investors might reasonably expect.

Economics consultants NERA were retained, by WAGN, to estimate the parameters of Black's Capital Asset Pricing Model, the Fama-French three factor model, and a zero-beta version of the Fama-French model. The zero-beta version of the Fama-French model, like Black's Capital Asset Pricing Model, gives recognition to the fact that investors are not able to borrow and lend freely at the risk free rate of return.

The results from NERA's work are summarized in Table 21.

Table 21
Rate of return on equity parameter estimates

Asset pricing model	Zero-beta premium[1]	Betas		
		Market	HML	SMB
Black's Capital Asset Pricing Model	0.065	0.80		
Fama-French three-factor model		0.65	0.38	0.44
Fama-French (zero beta) three factor model	0.065	0.65	0.38	0.44

[1] WAGN estimate.

Costs of equity calculated using each of these three models, and using estimates of other parameters made using current financial market data, are set out below.

Black's Capital Asset Pricing Model:

$E(r_e)$ = $r_{rf} + z + [E(r_m) - r_{rf} - z] \times \beta$

r_{rf} = 5.02%

z = 6.50%

$E(r_m) - r_{rf}$ = 6.50%

β = 0.80

$E(r_e)$ = 5.02% + 6.50% + [6.50% - 6.50%] x 0.80

= 11.52%

Fama-French three factor model:

$E(r_e)$ = $r_{rf} + [E(r_m) - r_{rf}] \times b + HML \times h + SMB \times s$

r_{rf} = 5.02%

$E(r_m) - r_{rf}$ = 6.50%

b = 0..65

HML = 3.61%

h = 0.38

SMB = 2.58%

s = 0.44

$E(r_e)$ = 5.02% + 6.50% x 0.65 + 3.61% x 0.38 + 2.58% x 0.44

= 11.76%

Fama-French (zero beta) three factor model:

$E(r_e)$ = $r_{rf} + z + [E(r_m) - r_{rf} - z] \times b + HML \times h + SMB \times s$

r_{rf} = 5.02%

z = 6.50%

$E(r_m) - r_{rf}$	=	6.50%
b	=	0.65
HML	=	3.61%
h	=	0.38
SMB	=	2.58%
s	=	0.44
$E(r_e)$	=	5.02% + 6.50% + [6.50% - 6.50%] x 0.65 + 3.61% x 0.38 + 2.58% x 0.44
	=	14.03%

SFG sought to estimate the return on equity expected by investors from data drawn from recent equity analysts' reports for six energy infrastructure businesses. These businesses were seen as being comparable to WAGN in the sense that an investment in any of them would be regarded by investors as an alternative to an investment in WAGN.

SFG found that the forecasts of dividend yield which the analysts had made for each of the six comparable businesses averaged 10.5%. Moreover, the forecasts had been quite stable in the recent past.

SFG also advised that data from recent equity raisings indicated that investors were currently seeking yields averaging around 15% but noted that, with only four observations available, reliance should not be placed on these forward-looking dividend yields. Nevertheless, the range - 10.26% to 21.48% - indicated that a dividend yield estimate of 10.5% may be conservative.

The dividend yield is only one component of the return available to equity investors. Those investors would also expect a component of return from stock price appreciation. SFG noted that the average forecast price appreciation from the data available from the equity analysts' research reports was 11.3%. However, the range was wide: 1.8% to 22.4%.

SFG therefore adopted a conservative view of price appreciation and concluded that a reasonable estimate of the expected nominal return on equity, based on current analysts' forecasts, was in the range 13% to 14%. In arriving at this range, SFG assumed

- real stock price appreciation of 0% to 1% (in circumstances where real output (GDP) is forecast to grow by between 2.5% and 3.5%); and
- price inflation of 2.5% (being the mid-point of the Reserve Bank of Australia's medium term target range for inflation).

SFG also applied a simultaneous estimation technique to jointly estimate dividend yield and expected long term share price appreciation. This was done in a way which reconciled each equity analyst's yield and growth forecasts with the same analyst's price

projection, thereby removing the effects of potential biases in the forecasts. The simultaneous estimation technique also produced a range of for the expected nominal return on equity of 13% to 14%.

As noted above, WAGN's application of the CAPM in a process of estimation and calculation guided by Rule 87(2) yielded an expected nominal rate of return on equity of 10.22%.

Estimates of the expected nominal rate of return on equity made using three other financial models were:

- Black's Capital Asset Pricing Model: 11.52%;
- Fama-French three factor model: 11.76%; and
- Fama-French (zero beta) three factor model: 14.03%.

From forecasts in recent equity analysts' reports for comparable energy infrastructure businesses, SFG estimated that the cost of equity was in the range 13% to 14%.

There is a clear pattern in these results.

The CAPM does not adequately take into account systematic risks as they affect expected rates of return on equity, and takes no account of idiosyncratic risk. It provides the lowest rate of return: 10.22%.

Black's Capital Asset Pricing Model was derived in a way which addressed one of the more contentious assumptions made for derivation of the CAPM. It was derived without assuming unrestricted borrowing and lending at the risk free rate of return. Black's Capital Asset Pricing Model does not take into account a view of systematic risk which is different from that taken into account in the CAPM and, like the CAPM, Black's Capital Asset Pricing Model takes no account of idiosyncratic risk.

The difference between the expected nominal rate of return on equity obtained from Black's Capital Asset Pricing Model (11.52%) and the rate obtained from the CAPM is 1.3%. This difference is a measure of the error attributable to the inappropriate assumption about borrowing and lending at the risk free rate made for CAPM derivation.

A broader - although by no means complete - view of systematic risk is incorporated in the Fama-French three factor model and, in consequence, that model produces a higher rate of return than the CAPM. This broader view of risk adds around 150 basis points to the nominal expected rate of return on equity. Like the CAPM, the Fama-French three factor model takes no account of idiosyncratic risk.

The zero beta version of the Fama-French three factor model "corrects" the assumption about unrestricted borrowing and lending at the risk free rate of return, and thereby adds around 230 basis points to estimate of the nominal rate of return on equity obtained using the "uncorrected" Fama-French model.

In summary, the CAPM yields a rate of return on equity of 10.2%. Correcting for one of the more contentious assumptions made in its derivation adds at least 130 basis points, increasing the equity rate of return to around 11.5%. Broadening the concept of risk (but not comprehensively, and without taking into account idiosyncratic risk) adds another 150 basis points, increasing the rate of return to 13.0%. This is the lower limit of the range of expected nominal rates of return on equity estimated by SFG.

SFG's range incorporates a comprehensive view of risk to the extent that equity analysts use all of the available information - about the economy and, about the specific businesses - when making their projections of dividend yields.

Specific business risks which would be taken into account were those analysts to make projections of dividend yields for WAGN can be broadly classified as commercial and regulatory risks (as in section 24(5) of the NGL).

A nominal expected rate of return on equity of 13.0% is, then, commensurate with prevailing conditions in the market for funds and commensurate with the risks involved in providing reference services using the WAGN GDS.

This nominal rate of return on equity can be used, as shown below, to calculate a real pre-tax WACC (assuming, as above, a cost of debt of 9.41%, and an estimate of gamma of 0.20).

Nominal pre-tax WACC:

$$WACC_{\text{nominal pre-tax}} = E(r_e) \times 1/[1 - t \times (1 - \gamma)] \times E/V + E(r_d) \times D/V$$

$$= 13.\ 0\% \times 1/[1 - 30.00\% \times (1 - 0.20)] \times 40.00\% + 9.41\% \times 60.00\%$$

$$= 12.49\%$$

Real pre-tax WACC:

$$WACC_{\text{real pre-tax}} = (1 + WACC_{\text{nominal pre-tax}})/(1 + \pi^e) - 1$$

$$= (1 + 12.49\%)/(1 + 2.60\%) - 1$$

$$= 9.64\%$$

Through the way in which it has been calculated, the real, pre-tax WACC of 9.64% is commensurate with prevailing conditions in the market for funds and with the risks involved in delivering the reference services. It can, therefore, be used as the rate of return required by Rule 87(1) of the NGR.

The total revenue and the reference tariffs of the Revised Proposed Access Arrangement for the WAGN GDS have been determined using a rate of return of 9.6% (real, pre-tax).

10 METHOD FOR DEALING WITH TAXATION [Rule 72(1)(h)]

Through use of a pre-tax WACC in the calculation of the return component of the Total Revenue, allowance is made – implicitly – for the cost of corporate income tax.

Under Australian taxation law, at least some of the shareholders of a corporation which distributes dividends receive credits for tax already paid at the corporate level. These credits – imputation credits – effectively reduce the cost of tax to the ultimate owners of the corporation. Through the factor γ in the formula for the nominal post-tax WACC, the implicit allowance for the cost of corporate income tax is reduced to recognise the value of imputation credits to shareholders.

11 EFFICIENCY GAINS AND LOSSES [Rule 72(1)(i)]

During the second access arrangement period, WAGN proposed incentive mechanisms in respect of User Initiated Capital Expenditure and Non Capital Costs.

User Initiated Capital Expenditure

An efficiency gain (or loss) in respect of User Initiated Capital Expenditure reflects the reduction (increase) in financing costs resulting from the difference between the actual and benchmark assumption for User Initiated Capital Expenditure in each calendar year. The financing gain is calculated by multiplying the Capital Expenditure saving by the WACC for the earlier Access Arrangement Period.

Non-Capital Costs

An efficiency gain (or loss) in respect of Non Capital Costs is calculated for each calendar year by comparing the difference between the actual Non Capital Costs and the benchmark Non Capital Costs. It is assumed that no further productivity gain is achieved between the penultimate and last years of the earlier Access Arrangement Period.

The expenditure benchmarks have been adjusted to take into account:

- changes in the scope of the activities which form the basis of the determination of the original benchmarks and
- the difference between forecast and actual growth by adjusting the original benchmarks on the basis of the difference between the actual number of connections in any year and the assumed number of connections for that year.

The efficiency gains achieved are detailed in Table 22. The carry-over of increments into Total Revenue for the next access arrangement period achieved is shown in Table 28.

Table 22
Efficiency gains

	2005	2006	2007	2008
Non capital costs incentive				
Adjusted benchmark OPEX	44.897	44.415	44.739	45.364
Actual OPEX	40.502	41.453	41.301	37.857
Underspending	4.394	2.963	3.437	7.506
Efficiency gain/loss (-ve)	4.394	-1.431	0.475	4.069
User initiated Capital Expenditure incentive				
Adjusted user initiated CAPEX benchmark	25.80	28.479	25.997	23.361
Adjusted user initiated CAPEX	27.136	31.794	28.661	23.131
Incremental gain	-1.336	-3.314	-2.664	0.231
Financing gain/loss (-ve)	-0.091	-0.225	-0.181	0.016

12 APPROACH TO SETTING REFERENCE TARIFFS [Rule 72(1)(j)]

12.1 New scheme for Reference Tariff determination

The *National Gas Access Law* and the *National Gas Rules* establish a scheme for Reference Tariff determination. For Gas distribution pipeline systems, this scheme is different in a number of significant ways to the scheme of the Code.

Rule 94 prescribes the way in which Reference Tariffs are to be set for Gas distribution pipeline systems. The rule has six parts:

(1) For the purpose of determining Reference Tariffs, customers for Reference Services provided by means of a distribution pipeline must be divided into Tariff Classes.

(2) A Tariff Class must be constituted with regard to:

- *(a) the need to group customers for Reference Services together on an economically efficient basis; and*
- *(b) the need to avoid unnecessary transaction costs.*

(3) For each Tariff Class, the expected revenue to be recovered should lie on or between:

- *(a) an upper bound representing the stand alone cost of providing the Reference Service to customers who belong to that class; and*
- *(b) a lower bound representing the avoidable cost of not providing the Reference Service to those customers.*

(4) A tariff, and if it consists of 2 or more charging parameters, each charging parameter for a Tariff Class:

- *(a) must take into account the long run marginal cost for the Reference Service or, in the case of a charging parameter, for the element of the service to which the charging parameter relates;*
- *(b) must be determined having regard to:*
  - *(i) transaction costs associated with the tariff or each charging parameter; and*
  - *(ii) whether customers belonging to the relevant Tariff Class are able or likely to respond to price signals.*

(5) If, however, as a result of the operation of subrule (4), the service provider may not recover the expected revenue, the tariffs must be adjusted to ensure recovery of expected revenue with minimum distortion to efficient patterns of consumption.

(6) The AER's discretion under this rule is limited.

WAGN's application of Rule 94 in the determination of the proposed revised Reference Tariffs for the Reference Services provided using the WAGN GDS is explained in the following paragraphs of this Access Arrangement Information.

In setting Reference Tariffs for the WAGN GDS, WAGN must also satisfy the requirements of the *National Gas Access (WA) (Local Provisions) Regulations 2009*. These requirements are considered in the final subsection of this section of this Access Arrangement Information.

12.2 Tariff Classes

Rule 94(1) requires that, for Tariff determination, customers for Reference Services be divided into Tariff Classes. "Tariff Class" is a new concept. It is defined, in Rule 69, as the customers for a Reference Service who constitute a Tariff Class under a Full Access Arrangement.

A Reference Service is provided to a User at each Delivery Point on the WAGN GDS. WAGN has, therefore, taken WAGN GDS Delivery Points as representing customers. By treating Delivery Points as customers, each customer is a customer in relation to only one Reference Service because only one Reference Service is provided at each Delivery Point.

About 609,000 customers are supplied with Gas from the WAGN GDS.

A small number of these customers (about 70) require relatively large volumes of Gas (in excess of 35 TJ/year) supplied at high or medium pressures (above 300 kPa). These customers require Haulage Service through the high pressure and medium pressure parts of the WAGN GDS which is essentially the same as the Haulage Service required by other customers. However, they require Gas delivery into plant and equipment which is customer specific and, for this, they must be provided with User Specific Delivery Facilities – Service Pipes, regulators, and metering equipment – designed and constructed to deliver Gas into their customer specific plant and equipment. The User Specific Delivery Facilities must also be designed and constructed to accommodate the peak flows of 10 GJ/hour or more required by these customers, and to allow remote monitoring using Telemetry as required by the *Retail Market Rules*.

These large use customers are provided with Service A1, and can be grouped together as a single Tariff Class – Tariff Class A1.

Approximately 100 customers require volumes of Gas in excess of 10 TJ/year but less than 35 TJ/year. These customers require Haulage Service through the high pressure and medium pressure parts of the WAGN GDS which is essentially the same as the Haulage Service required by other customers. However, they require Gas delivery into plant and equipment which is customer specific and, for this, they must be provided with User Specific Delivery Facilities designed and constructed to deliver Gas into their customer specific plant and equipment. The User Specific Delivery Facilities must be designed and constructed to accommodate the peak flows of at most 10 GJ/hour which are required by these customers, and to allow remote monitoring using Telemetry as required by the *Retail Market Rules*. This second group of larger use customers are provided with Service A2, and are a single Tariff Class – Tariff Class A2.

Some 1,200 customers require volumes of Gas which do not exceed 10 TJ/year, and require Contract Peak Rates which are less than 10 GJ/hour. These customers require Haulage Service through the high pressure and medium pressure parts of the WAGN GDS which is essentially the same as the Haulage Service required by Tariff Class A1 and Tariff Class A2 customers. They also require Gas delivery into plant and equipment which is customer specific and, for this, they must be provided with User Specific Delivery Facilities designed and constructed to deliver Gas into their customer specific plant and equipment. The User Specific Delivery Facilities must be designed and constructed to accommodate the peak flows of at most 10 GJ/hour which are required by these customers. However, because their annual requirements do not exceed 10 TJ/year, these customers do not require remote monitoring, using Telemetry, of metering at Delivery Points. These 1,200 customers are provided with Service B1, and can be grouped together as a single Tariff Class – Tariff Class B1.

The remainder of the customers (some 608,000) require relatively small volumes of Gas for commercial and residential use. They can be supplied from the high pressure, the medium pressure and the low pressure parts of the WAGN GDS, and require Haulage Service essentially the same as the Haulage Service required by Tariff Class A1, Tariff Class A2 and Tariff Class B1 customers. Their requirements for relatively small volumes at low pressures allow these customers to be supplied using Standard Delivery Facilities.

Around 7,500 of these small use customers require somewhat larger volumes, and Gas deliveries at higher peak rates, than the remainder. All of these customers can be supplied using up to 20 metres of Service Pipe, a Standard Pressure Regulator and a Standard 12 m^3/hour meter. These 7,500 customers are provided with Service B2, and can be grouped together as a single Tariff Class – Tariff Class B2.

The remainder of the small use customers (approximately 600,000 customers) can be supplied using up to 20 metres of Service Pipe, a Standard Pressure Regulator and a standard small use Meter rated at 6 to 8 m^3/hour. These customers are provided with Service B3, and can be grouped together as a single Tariff Class – Tariff Class B3.

The grouping of customers into Tariff Classes which correspond to the existing structure of Reference Services can be carried out, as required by Rule 94(2), on an economically efficient basis and in a way which avoids unnecessary transaction costs.

12.3 Charging parameters for each Tariff Class

Once customers have been divided into Tariff Classes, the Reference Tariff payable by the customers in each Tariff Class is to be determined in accordance with Rule 94(4). Each of the Reference Services provided using the WAGN GDS can be divided into a number of elements, and a charging parameter can be assigned to each of these elements. The Reference Services offered by WAGN, and the Tariff Classes, Reference Tariffs, service elements and charging parameters associated with each of these Reference Services, are set out in Table 23.

Table 23
WAGN GDS Reference Services, Tariff Classes, Reference Tariffs, service elements and charging parameters

Reference service Tariff Class Reference tariff	Service element	Charging parameter
A1	Use of distribution system capacity Haulage Haulage Provision of Service Pipe, regulators, metering and Telemetry	Standing Charge Demand Charge Usage Charge User specific Charge
A2	Use of distribution system capacity Haulage Provision of Service Pipe, regulators, metering and Telemetry	Standing Charge Usage Charge User specific Charge
B1	Use of distribution system capacity Haulage Provision of Service Pipe, regulators, and metering	Standing Charge Usage Charge User specific Charge
B2	Use of distribution system capacity Haulage	Standing Charge Usage Charge
B3	Use of distribution system capacity Haulage	Standing Charge Usage Charge

The existing structure of the Reference Tariff for each Reference Service has been largely retained as the structure of the proposed revised Reference Tariff for each Tariff Class. The Reference Tariff for each Tariff Class will have a standing Charge and a usage Charge. In each case, the usage charge has two blocks. In addition, Tariffs A1, A2 and B1 will have a further charging parameter – a User specific Charge – which varies between customers in accordance with individual requirements for User Specific Delivery Facilities. Reference tariff A1 will have a third charging parameter – a demand Charge – which is related to the distance from the nearest transmission pipeline, and is designed to avoid inefficient bypass of the WAGN GDS.

12.4 Reference tariff determination

Rule 94 requires a sequential approach to Reference Tariff determination, and proposed revised Reference Tariffs for the WAGN GDS have been determined by applying the sequence of four steps set out in the paragraphs which follow. (Under the scheme of the National Gas access Law and National Gas Rules, Reference Tariffs for Distribution Pipelines are not determined by allocating costs to Reference Services as was the case under the Code.)

Reference tariff determination: Step 1

First, the Tariff for each Tariff Class is determined as a multipart Tariff with:

- the standing Charge determined as the long run marginal cost of providing distribution system capacity and connectivity, and
- the usage Charge (and, in the case of Reference Tariff A1, the demand Charge) set to provide a contribution to recovery of Total Revenue.

The usage Charge is, in effect, an "entry fee". Once a User has paid the entry fee of the Reference Tariff, it is free to use the corresponding Reference Service to an extent which is determined solely by the level of the standing Charge (which is, in turn, determined from long run marginal cost).

The usage Charges (and, in the case of Tariff A1, the demand Charge) have been set at the levels at which the revenue from those Charges (for all Reference Services) recovers the amount by which the Total Revenue (the total cost of providing all Haulage Services) exceeds the expected revenue from standing Charges.

Reference Tariff determination: Step 2

Once an initial Tariff has been determined for a Tariff Class (Step 1), the expected revenue from that Tariff has been compared, in accordance with Rule 94(3), with:

- the stand alone cost of providing the corresponding Reference Service to customers in that Tariff Class; and
- the avoidable cost of providing the Reference Service to those customers.

If, for any Tariff Class, the revenue expected to be recovered at the Tariff determined in Step 1 exceeds the stand alone cost of providing Reference Services to customers who belong to that Tariff Class, the Tariff must be reduced, by reducing the standing Charge, until the stand alone cost test of Rule 94(3) is satisfied.

If, for any Tariff Class, the revenue expected to be recovered at the Tariff determined in Step 1 is less than the avoidable cost of not providing the Reference Service to customers in that Tariff Class, the Tariff must be increased, by increasing the standing Charge, until the avoidable cost test of Rule 94(3) is satisfied.

Reference Tariff determination: Step 3

Section 24 of the National Gas Access Law sets out revenue and pricing principles which must be taken into account by the ERA when exercising discretion in approving those parts of an access arrangement relating to a Reference Tariff. In accordance with the principle of section 24(2):

A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in –

(a) providing Reference Services; and

(b) complying with a regulatory obligation or requirement or making a regulatory payment.

There is, however, no reason why a set of Tariffs determined using long run marginal costs as required by Rule 94(4), and satisfying the stand alone and avoidable cost tests of Rule 94(3), should provide the Service Provider with the opportunity to recover the efficient costs incurred in providing the Reference Services and in complying with its regulatory obligations. If this is the case, a further mechanism for adjustment is required in the Tariff determination process. That mechanism is in Rule 94(5).

That part of the Total Revenue allocated to Reference Services is to be determined in accordance with Rule 76 and Rule 93. Rule 76 specifies the components of Total Revenue. Rule 93 governs the allocation of the Total Revenue between reference and other services. The Total Revenue which WAGN has determined is wholly attributable to the WAGN GDS; no part of it is allocated to other services.

If, when Tariffs are determined in the way set out in Steps 1 and 2 above, the Service Provider is unable to recover that part of the Total Revenue allocated to Reference Services, the Tariffs so determined must be adjusted, in accordance with Rule 94(5), to ensure recovery of that part of the Total Revenue allocated to Reference Services in a way which minimises distortion to efficient patterns of consumption. WAGN has interpreted Rule 94(5) as requiring that, should usage Charges have to be increased, the Charges for those Reference Services for which the demands are least elastic should be increased by the largest amount.

Reference Tariff determination: Step 4

If the Tariffs calculated at Step 3 satisfy the stand alone and avoidable costs tests of Rule 94(3), they are the required Reference Tariffs. If they do not satisfy those tests, further adjustments must be made to ensure that all of the requirements of Rule 94 are satisfied, and the service provider has the opportunity to recover that part of the Total Revenue allocated to Reference Services.

Steps 1 to 4 yield Reference Tariffs which satisfy the requirements of Rule 94(4)

The structure of Tariffs set out in Table 23, with the charging parameters determined in the way described above (the standing Charges set at the long run marginal costs of providing the Reference Services, and the usage Charges set to provide contributions to recovery of total revenue) satisfies the requirements of Rule 94(4):

- account is taken of long run marginal costs;
- there are no significant transaction costs associated with each charging parameter; and
- since each Reference Tariff comprises a fixed Charge and a volume-related Charge, customers in each Tariff Class are likely to have sufficient information (their

histories of Gas deliveries) to be able to respond to the price signals provided by the Tariff payable by customers in that Tariff Class.

12.5 Change required by Rule 94

The structure of the Reference Tariffs applying in the earlier Access Arrangement Period was essentially unchanged from that established for the initial Access Arrangement Period. Furthermore, although the Total Revenue was higher in the earlier Access Arrangement Period, leading to higher Tariffs, the way in which that Total Revenue was allocated to Reference Tariffs was essentially unchanged from the allocation which had been adopted for the initial Access Arrangement Period. The structure of Tariffs established for the initial Access Arrangement Period, and the allocation of Total Revenue to those Tariffs, provided a set of Distribution Pipeline Tariffs which were consistent with the Gas retail Tariffs prevailing at that time and which were to remain (at that time) unchanged.

In consequence, the Total Revenue of the WAGN GDS was allocated to Users of Reference Services on the basis of Gas volumes transported through the distribution system, and the Reference Tariffs had the declining block structure commonly used by integrated Gas retailers. The Reference Tariffs established for the initial and earlier Access Arrangement Periods provided the service provider with a reasonable opportunity of recovering at least its efficient costs, but could not provide signals for efficient investment in, and for efficient operation and use of, the WAGN GDS.

Rule 94 precludes this outcome by requiring that Reference Tariffs be constructed in such a way that they provide proper signals for efficient investment in, and for efficient operation and use of, Distribution Pipelines. Tariffs constructed in accordance with Rule 94 are unlikely to be consistent with the retail Tariffs determined by an integrated Gas retailer.

Distribution Pipeline costs and, in particular, the costs of developing, operating and maintaining the WAGN GDS, are not closely related to the volume of Gas transported. Those costs vary with the capacity which is provided in the various parts of a Distribution Pipeline, and with the (very large) number of points at which end-users can connect to the system and take delivery of the Gas transported. Future requirements for capacity and connectivity, and not for additional volumes delivered, are the primary determinants of the distribution pipeline system long run marginal costs which are to be the basis of Reference Tariffs determined in accordance with Rule 94.

Accordingly, WAGN has determined, for each of the Reference Services provided using the WAGN GDS during the Current Access Arrangement Period, the incremental cost of connecting the forecast increase in the number of customers requiring the service. This incremental cost comprises the incremental capital costs (return and depreciation), and the incremental operating costs. The ratio of the incremental cost to the increase in service requirement (the product of the number of new connections and the system capacity required to support each connection), has been taken as the long run marginal cost of providing the Reference Service in question using the WAGN GDS.

This long run marginal cost is not directly related to volume. It is related to the change in number of connections to the WAGN GDS. Its economic focus is not the end-user of Gas, but a Prospective User of the Distribution Pipeline: it provides the correct signal to the Prospective User in terms of the efficient cost of an additional connection to the WAGN GDS.

WAGN has, therefore, sought to determine the standing Charge component of each Reference Tariff from the long run marginal cost of providing the corresponding Reference Service. The usage Charge has then been determined as the volume-related Charge which allows WAGN the opportunity to recover its Total Revenue.

12.6 First Tariff estimates, the tests of Rule 94(3), and Tariff adjustment in accordance with Rule 94(5)

When the Tariffs for the WAGN GDS are established using the long run marginal costs of the Reference Services as the standing Charges, and a usage Charge set to recover (approximately) the remainder of Total Revenue, those Tariffs are as shown in Table 24.

Table 24
WAGN GDS first Tariff estimates

Tariff	Charging parameter		Tariff estimate[1]
A1	Standing Charge	$/year	180,487.87
	Demand Charge	$/GJ km	-
	Usage Charge	$/GJ	0.04
A2	Standing Charge	$/year	13,808.29
	Usage Charge	$/GJ	0.04
B1	Standing Charge	$/year	4,020.42
	Usage Charge	$/GJ	0.04
B2	Standing Charge	$/year	528.58
	Usage Charge	$/GJ	2.00
B3	Standing Charge	$/year	188.04
	Usage Charge	$/GJ	2.00

[1] All Tariff estimates are in real, December 2009 dollars.

The first Tariff estimates of Table 24 are very different from the Reference Tariffs prevailing at the end of the earlier Access Arrangement Period.

These Tariffs satisfy the stand alone and avoidable cost tests of Rule 94(3), as shown in Table 25. However, if they were to be implemented, they would not allow WAGN to recover its Total Revenue over the Current Access Arrangement Period.

Table 25
Stand alone costs, avoidable costs, expected revenue and Total Revenue[1]

Tariff	Cost/Revenue	$m[2]	Test
A1	Standing alone cost	239.318	Satisfied
	Avoidable cost	5.360	Satisfied
	Expected revenue	**32.892**	
A2	Standing alone cost	350.131	Satisfied
	Avoidable cost	1.756	Satisfied
	Expected revenue	**8.794**	
B1	Standing alone cost	419.605	Satisfied
	Avoidable cost	3.859	Satisfied
	Expected revenue	**21.847**	
B2	Standing alone cost	431.034	Satisfied
	Avoidable cost	4.103	Satisfied
	Expected revenue	**26.078**	
B3	Standing alone cost	571.003	Satisfied
	Avoidable cost	62.507	Satisfied
	Expected revenue	**463.692**	
All Tariffs	Total revenue	602.837	
	Expected revenue	**553.303**	Total revenue not recovered

[1] Stand alone costs, avoidable costs, expected revenues and Total Revenue are expressed as present values of costs/revenues in each year of the Current Access Arrangement Period. The present values have been calculated using the Rate of Return as the discount factor.

[2] All values are real, December 2009 dollars.

Moreover, their implementation would be likely to result in significant price shock, particularly for end-users of Gas supplied using the B2 and B3 Reference Services. These end-users are the small use customers which are to be protected by the *National Gas Access (WA) (Local Provisions) Regulations.*

WAGN has therefore determined the Reference Tariffs for the WAGN GDS by adjusting these first Tariff estimates so that:

- price shock is avoided, while allowing Tariffs to partially adjust toward the first Tariff estimates over the Current Access Arrangement Period;
- the Charges for those Reference Services for which the demands are least elastic are increased by the largest amounts so as to minimise distortion to efficient patterns of consumption in accordance with Rule 94(5); and
- the present value of the expected revenue from the resulting Reference Tariffs is equal to the present value of Total Revenue.

The Reference Tariffs so determined are set out in Table 26.

Table 26
WAGN GDS Reference Tariffs exclusive of GST[1]

Tariff	Charging parameter		1 January 2011	1 July 2011	1 July 2012	1 July 2013
A1	Standing Charge	$/year	45,000.00	46,800.00	48,204.00	49,650.12
	Demand Charge					
	First 10 km	$/GJ km	189.68	197.27	203.19	209.29
	Distance > 10 km	$/GJ km	99.84	103.83	106.94	110.15
	Usage Charge					
	First 10 km	$/GJ km	0.040240	0.041850	0.043110	0.044400
	Distance > 10 km	$/GJ km	0.020110	0.020910	0.021540	0.022190
A2	Standing Charge	$/year	24,912.07	25,908.55	26,685.81	27,486.38
	First 10TJ	$/GJ km	2.40	2.50	2.58	2.66
	Volume > 10TJ	$/GJ km	1.29	1.34	1.38	1.42
B1	Standing Charge	$/year	1,250.00	1,300.00	1,339.00	1,379.17
	First 5TJ	$/GJ	4.80	4.99	5.14	5.29
	Volume > 5TJ	$/GJ	4.12	4.28	4.41	4.54
B2	Standing Charge	$/year	309.34	321.71	331.36	341.30
	First 100GJ	$/GJ	8.00	8.32	8.57	8.83
	Volume > 100GJ	$/GJ	4.76	4.95	5.10	5.25
B3	Standing Charge	$/year	63.14	65.67	67.64	69.67
	First 10GJ	$/GJ	13.43	13.97	14.39	14.82
	Volume > 10GJ	$/GJ	5.80	6.03	6.21	6.40

[1] All Tariffs are real, December 2009 dollars.

The Reference Tariffs in Table 26 satisfy the stand alone and avoidable cost tests of Rule 94(3), as shown in Table 27. They also allow WAGN to recover its Total Revenue over the Current Access Arrangement Period.

Table 27
Stand alone costs, avoidable costs, expected revenue from Reference Tariffs and Total Revenue

Tariff	Cost/Revenue	$m[1]	Test
A1	Standing alone cost	239.318	Satisfied
	Avoidable cost	5.360	Satisfied
	Expected revenue	**22.904**	
A2	Standing alone cost	350.131	Satisfied
	Avoidable cost	1.756	Satisfied
	Expected revenue	**21.865**	
B1	Standing alone cost	419.605	Satisfied
	Avoidable cost	3.859	Satisfied
	Expected revenue	**35.388**	
B2	Standing alone cost	431.034	Satisfied
	Avoidable cost	4.103	Satisfied
	Expected revenue	**36.623**	
B3	Standing alone cost	571.003	Satisfied
	Avoidable cost	62.507	Satisfied
	Expected revenue	**486.058**	
All Tariffs	Total revenue	602.837	Total revenue
	Expected revenue	**602.837**	recovered

[1] All values are real, December 2009 dollars.

13 REFERENCE TARIFF VARIATION MECHANISM [Rule 72(1)(k)]

Annexure B of the Access Arrangement provides for variation of the Reference Tariffs:

- in accordance with a formula; and
- as a result of a cost pass through for a defined event.

13.1 Reference Tariff variation in accordance with formula

The Reference Tariffs set out in the preceding section of this Access Arrangement Information are all real, December 2009 dollar values. They must be periodically varied for the effects of inflation during the Current Access Arrangement Period if WAGN is to have the opportunity of recovering its efficiently incurred – nominal - costs of providing Reference Services.

The Access Arrangement for the WAGN GDS therefore includes a Reference Tariff Variation Mechanism which varies the Tariffs set out in Table 26 above for the effects of inflation from December 2009 to each of the dates on which varied Tariffs are to come into effect, being 1 January 2011, 1 July 2011, 1 July 2012, and 1 July 2013.

The variation of the Reference Tariffs for the effects of inflation is effected through formulae set out in Annexure B. The measure of inflation applied in these formulae is the Consumer Price Index, All Groups, Perth.

The formulae set out in Annexure B of the Access Arrangement also progressively vary the Reference Tariffs for 1 January 2011 (as set out in Table 26), so that the standing Charges are partially adjusted toward the corresponding long run marginal costs during the Current Access Arrangement Period. The adjustments, which apply not only to the standing Charges but also to the other charging parameters, are:

- from 1 July 2011, the charging parameters of Tariff A1, Tariff A2, Tariff B1, Tariff B2 and Tariff B3 are increased by 4.00% to partially adjust them toward the first Tariff estimates;
- from 1 July 2012, the charging parameters of Tariff A1, Tariff A2, Tariff B1, Tariff B2 and Tariff B3 are increased by 3.00% to partially adjust them toward the first Tariff estimates;
- from 1 July 2013, the charging parameters of Tariff A1, Tariff A2, Tariff B1, Tariff B2 and Tariff B3 are increased by 3.00% to partially adjust them toward the first Tariff estimates.

In addition, the formulae of the Reference Tariff Variation Mechanism allow WAGN to recover certain costs which are beyond its control, and which could not be predicted with any great certainty prior to the time at the revisions to the Access Arrangement were approved. The two principal types of cost which can be recovered through the operation of the formulae are:

- unanticipated increases in regulatory costs – the direct and indirect costs of action by agencies of government; and

- the additional costs which arise from unanticipated increases in the price of Gas purchased to replace unaccounted for Gas (but not from any unanticipated increases in the volume of that replacement Gas).

The unanticipated regulatory costs which can be recovered through the formulae of the Reference Tariff Variation Mechanism include both unanticipated regulatory Operating Expenditures and unanticipated regulatory capital costs. The unanticipated regulatory capital costs are to be depreciated in the usual way, and an annual return is to be allowed on the undepreciated balance at the Rate of Return. Only the depreciation and return (and not the capital amount) are recoverable via the formulae of the Reference Tariff Variation Mechanism.

At the end of the Current Access Arrangement Period, the undepreciated balance associated with any unanticipated regulatory Capital Expenditure should be added to the Capital Base and recovered via future Reference Tariffs. (It should not be recovered by continued operation of the Reference Tariff Variation Mechanism.)

The formulae of the Reference Tariff Variation Mechanism allow an unanticipated increase in uncontrollable (regulatory capital or operating) costs to be recovered during the year following the increase. An adjustment is made, at the Rate of Return, for the opportunity cost associated with the deferral of cash flow.

The formulae of the Reference Tariff Variation Mechanism of Annexure B in effect impose variable caps on the revenue to be derived from the Reference Services.

13.2 Reference Tariff variation as a result of cost pass through

The Reference Tariff Variation Mechanism continues and extends the scheme of Tariff variation for defined cost pass through events included in the Access Arrangement in the earlier Access Arrangement Period. Specific events which give rise to costs which can be recovered through Tariff variation for cost pass through are:

- WAGN incurs HHV Costs that constitute Conforming Capital Expenditure or conforming Operating Expenditure;

- WAGN incurs Physical Gate Point Costs that constitute Conforming Capital Expenditure or conforming Operating Expenditure;

- WAGN incurs Conforming Capital Expenditure or conforming Operating Expenditure as a result of, or in connection with, a tax change or regulatory change;

- WAGN incurs Conforming Capital Expenditure or conforming Operating Expenditure as a result of, or in connection with, any law that:

- establishes, changes or regulates the operation of, an emissions trading scheme or mechanism that has as one of its objectives the management or reduction of greenhouse Gas emissions or concentrations and which includes the scheme set out in, or a scheme similar to, the scheme contemplated in the Carbon Pollution Reduction Scheme Bill 2009 (Cth) and its associated legislation and regulations, as promulgated, supplemented or amended from time to time;

- imposes a fee, penalty or tax on greenhouse Gas emissions or concentrations; or

- establishes, changes or regulates the operation of, any renewable energy scheme, including the scheme under the *Renewable Energy (Electricity) Act 2000* (Cth) and its associated legislation and regulations, as promulgated, supplemented or amended from time to time; and

- WAGN incurs conforming Operating Expenditure additional to the amount forecast for the purpose of determining Total Revenue for the Current Access Arrangement Period because there has been an unanticipated change in the price of Gas required to replace unaccounted for Gas.

13.3 Requirements of Rule 97(3)

Rule 97(3) requires that, when deciding whether a particular Reference Tariff Variation Mechanism is appropriate to a particular access arrangement, the ERA must have regard to:

- the need for efficient Tariff structures; and

- the possible effects of the Reference Tariff Variation Mechanism on administrative costs of the ERA, the Service Provider, and Users or potential Users; and

- the regulatory arrangements (if any) applicable to the relevant Reference Services before the commencement of the proposed Reference Tariff Variation Mechanism; and

- the desirability of consistency between regulatory arrangements for similar services (both within and beyond the relevant jurisdiction).

The Reference Tariff Variation Mechanism does not change the structure of the Tariffs for the Reference Services provided using the WAGN GDS. The structure of those Tariffs is determined in accordance with the provisions of Rule 94, which require that consideration be given to economic efficiency.

The Reference Tariff Variation Mechanism does not substantially change the procedures previously followed by WAGN and by the Economic Regulation Authority in varying the Reference Tariffs for the WAGN GDS, and should not change the procedures followed by Users and potential Users in responding to Tariff changes. The

mechanism introduces a further step into the scheme of Tariff variation which previously applied: variation of the Reference Tariffs at the commencement of a new access arrangement period to allow for inflation and for recovery of additional regulatory costs incurred in the last year of the prior Access Arrangement Period. This should not significantly increase administrative costs. WAGN will incur the – relatively small – costs of determining and promulgating the change through issue of a variation report, and amendment of its Tariff schedules, and the Economic Regulation Authority will have one further Tariff variation to review. Because the Tariff variation in question coincides with the Reference Tariffs for a new Access Arrangement Period coming into effect, Users are not expected to incur additional administrative costs.

The Reference Tariff Variation Mechanism does not change the form of the regulatory arrangements previously applicable to the Reference Services provided using the WAGN GDS. It only extends the operation of those arrangements to cover a number of gaps in their application.

In Western Australia, there is no other provider of services similar to the Reference Services provided by WAGN using the WAGN GDS. There is, therefore, no issue of consistency between the Reference Tariff Variation Mechanism and regulatory arrangements for similar services.

14 INCENTIVE MECHANISM [Rule 72(1)(l)]

There is no incentive mechanism proposed for the Current Access Arrangement Period.

15 TOTAL REVENUE [Rule 72(1)(m)]

Reference Tariffs determined by applying the sequence of four steps set out in section 12.4 of this submission should allow WAGN to recover that part of the Total Revenue allocated to Reference Services.

In accordance with Rule 76, the Total Revenue is to be determined using the "building block approach":

Total revenue is to be determined for each regulatory year of the access arrangement period using the building block approach in which the building blocks are:

(a) a return on the projected Capital Base for the year (See Divisions 4 and 5); and

(b) depreciation on the projected Capital Base for the year (See Division 6); and

(c) if applicable – the estimated cost of corporate income tax for the year; and

(d) increments or decrements for the year resulting from the operation of an incentive mechanism to encourage gains in efficiency (See Division 9); and

(e) a forecast of Operating Expenditure for the year (See Division 7).

The building blocks of Total Revenue in each regulatory year of the Current Access Arrangement Period, and the Total Revenue in each year, are shown in Table 28.

Table 28
Total revenue
($ million, December 2009)

	2010[1]	2010/11	2011/12	2012/13	2013/14
Return on Capital Base	38.112	79.818	82.132	84.584	86.675
Return on Working Capital	0.271	0.965	1.118	1.150	1.157
Depreciation	1.746	24.394	26.532	28.634	30.679
Efficiency gains	3.513	4.874	3.551	4.232	2.042
Ancillary Reference Services	0.425	0.739	0.739	0.739	0.739
Forecast Operating Expenditure	36.638	60.223	60.849	60.859	61.404
Total	**80.705**	**171.014**	**174.922**	**180.199**	**182.697**

[1] January 2010 to 30 June 2010 only.

No explicit estimate of tax has been made for the purpose of determining Total Revenue (see section 10 of this document).

15.1 Allocation of the Total Revenue to Reference Services

Rule 93 governs the allocation of the Total Revenue to Reference Services. The Total Revenue is to be allocated between reference and other services in the ratio in which costs are allocated between reference and other services (Rule 93(1)).

WAGN does not provide other services using the WAGN GDS, and all Total Revenue during the Current Access Arrangement Period has been attributed to the provision of the Reference Services.

15.2 Meter lock, deregistration, disconnection and reconnection

The following are offered as Reference Services:

- apply Meter Lock – a Meter lock is applied to the Meter at a Delivery Point at which a User is entitled to take delivery of Gas under Service B3;
- remove Meter Lock – a Meter lock is removed from a Meter at a Delivery Point at which a User is entitled to take delivery of Gas under a Service B3;
- deregistration – effects permanent removal of a Meter from a Delivery Point and termination of the association of a User with the Delivery Point;
- disconnection – the supply of Gas at a Delivery Point at which a User is entitled to take delivery of Gas under Service B2 or Service B3 is disconnected; and
- reconnection – recommences the supply of Gas at the Delivery Point at which a User is entitled to take delivery of Gas under Service B2 or Service B3 and at which a Disconnection Service has previously been supplied.

Costs associated with these elements of the Reference Services have been deducted in the calculation of Tariff Revenue.

15.3 Prudent discounts

Rule 96(1) allows a Service Provider to provide, in certain circumstances, a Reference Service to a particular User or class of Users at a discounted Reference Tariff, and to recover the cost of providing the discount from the provision of reference or other services in one or more future Access Arrangement Periods.

The Service Provider may only recover the cost of providing the discount if the discount is approved by the ERA. Before approving a discount – a prudent discount – the ERA must be satisfied that:

- the discount is necessary to respond to competition from other providers of Pipeline Services or from suppliers of energy from sources other than Gas, or is necessary to maintain efficient use of a Pipeline System; and
- provision of the discount is likely to lead to Reference Tariffs lower than would otherwise have been the case.

During the initial Access Arrangement Period, WAGN offered discounts to certain Users of the WAGN GDS but received no compensation for foregone revenue. The discounts were approved by the ERA for the earlier Access Arrangement Period because the regulator was satisfied that the discounts were necessary to respond to competition, and

that their provision would lead to lower Reference Tariffs. The cost of providing these discounts during the earlier Access Arrangement Period was recovered via the Reference Tariffs set for that period.

WAGN is continuing to provide prudent discounts, and will recover the cost of their provision through the revised Reference Tariffs for the Current Access Arrangement Period. The revenue expected to be received from Users in respect of Reference Services provided at discounted Reference Tariffs is shown in Table 29.

Table 29
Revenue from Reference Services provided at discounted Reference Tariffs
($ million, December 2009)

	2010[1]	2010/11	2011/12	2012/13	2013/14
Revenue	1.613	3.272	3.286	3.250	3.161

[1] January 2010 to 30 June 2010 only.

WAGN has deducted this revenue from the Total Revenue shown in Table 28 before setting the Reference Tariffs for the Current Access Arrangement Period (see section 12.4 above). In calculating the expected revenue from the provision of Reference Services, WAGN has deducted from its customer connections forecasts the numbers of customer connections expected to be in receipt of prudent discounts during the current Access Arrangement Period. Similarly, the forecast volumes of Gas expected to be delivered to customers in receipt of prudent discounts has been deducted from the forecast volumes of Gas expected to be delivered during the Current Access Arrangement Period.