AGL Pipelines (NSW) Pty Limited
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Access Arrangement Information
For Central West Pipeline

This Access Arrangement Information is submitted pursuant to Section 2.2 of the Code.

Pursuant to the Code, this document does not contain information the disclosure of which could be unduly harmful to the legitimate business interests of the Service Provider or a User or a Prospective User (such as forecasts). Accordingly, such information is not included in this Access Arrangement Information.

1. INTRODUCTION

1.1 Overview of the Access Arrangement Information

This Access Arrangement Information is submitted together with the Access Arrangement of AGL Pipelines (NSW) Pty Limited (**"AGLP"**) pursuant to Section 2.2 of the Code.

AGLP is a wholly owned subsidiary of the AGL Group, and is the owner of the Pipeline referred to in the Access Arrangement.

The Access Arrangement adopts a Net Present Value (NPV) Approach (with residual) to determine Reference Tariffs.

Terms used in this Access Arrangement Information have the meanings given to them in Schedule 1 of the Access Arrangement.

Attachment 1 to this document shows the information categories listed in Attachment A of the Code and indicates where this information is contained within this document.

1.2 Background to the Central West Project

Having successfully introduced natural gas to other regional centres in New South Wales, the AGL Group began in the 1990s to investigate the potential of transporting and distributing natural gas to the Forbes, Parkes, Narromine and Dubbo environs (known as the "Central West Project"). However, the project's relatively small loads and the presence of competing fuels meant that its commercial viability was questionable.

With the establishment of the Federal Government's Regional Development Program, funding of up to $2 million was made available to the Orana Regional Economic Development Organisation[1] ("ORDO") towards the installation of gas infrastructure in the Central West region. The availability of this funding contributed to making the Central West Project a more commercially viable proposal.

A condition of the Federal Government funding was that a tender process to select the preferred developer of the gas infrastructure would be managed by ORDO. The AGL Group was selected as the preferred developer and by June 1998 had constructed the Central West Pipeline ("CWP"[2]) from the Marsden off-take (on the Moomba to Sydney pipeline) to Dubbo. The AGL proposal, which was supported by the local communities, included a common (ie zonal) tariff for all Users of the pipeline within the Marsden/Dubbo zone. A zonal tariff has the benefit that no community within the zone

[1] ORDO which later became Orana Development & Employment Council ("ODEC"), with the funding made available to ORDO in conjunction with the Dubbo Development Corporation.
[2] This is the Pipeline referred to in the Access Arrangement.

would be at a cost disadvantage relative to any other community in securing a gas supply.

2. ACCESS & PRICING PRINCIPLES

2.1 Tariff Pricing Principles

The CWP is a new pipeline which will deliver gas into a yet to be established market, and consequently the Reference Tariff Policy reflects the market realities of introducing natural gas as a competitive energy source in the Central West region. With reference to market realities, the pricing principles need to take into account the following:

1) Entry price for gas: The Code requires that the Reference Tariffs should be designed with a view to replicating the outcomes of a competitive market[3]. The price of established alternate fuels is a key element in determining a competitive market price for gas in the Central West region.

2) Price path: The Code requires that the Reference Tariffs should be designed with a view to providing the Service Provider with the opportunity to earn a stream of revenue that recovers the efficient costs of delivery of the Reference Service over the expected life of the assets used in delivering this Service[4]. In order to achieve this objective, and recognising the effect of the competitive fuel market on prices, it is necessary to ensure that the price path compensates in later years for the early years of low tariffs.

3) Market growth: The Code requires that the Reference Tariffs should be designed with a view to providing an incentive to the Service Provider to reduce costs and to develop the market for Reference and other Services[5]. In the absence of significant foundation contracts and in the light of competitive fuel prices, AGLP faces significant risks in developing the market for use of the CWP. The Reference Tariffs must be established at a level which allows AGLP to grow the market as quickly and efficiently as possible, in order to achieve this objective.

4) Zonal tariffs: In accordance the AGL Group's proposal, a single common tariff is to apply for all Users within the Marsden to Dubbo zone.

2.2 Reference Tariff Determination

2.2.1 Price Path

Reference Tariffs will follow a price path determined by applying the NPV methodology over the economic life of the CWP. During the first Access Arrangement Period, Tariffs will follow a price path that reflects both the need for a low entry price, and the requirement for Tariffs to move to an appropriate level to provide the revenues required to sustain AGLP's investment in the CWP over its economic life.

[3] Section 8.1(b)
[4] Section 8.1(a)
[5] Section 8.1(f)

Of the Reference Tariffs set out in Section 3 of the Access Arrangement, tariffs of $1.78[6], $1.98 and $2.17 per GJ for the years ending 30 June 1999, 2000 and 2001 have already been committed to by AGLP and communicated to the market. This was necessary because at the time the CWP was commissioned the Code was not in place, and Prospective Users required tariff certainty prior to committing to using the CWP. It is further proposed that prices of $2.37, $2.58 and $2.78 per GJ will apply for years 2002-4 respectively with the price path thereafter to move to a tariff linked to CPI.

2.2.2 Zonal Tariff

For new pipelines (and particularly those with no identifiable cost attributable to any specific user - eg compression costs) linking similar user classes in different geographic areas, a zonal tariff structure ensures that all Users will benefit whilst no user is disadvantaged in terms of price. One of the concerns of ORDO in pursuing the development of gas infrastructure in the Central West was that no local community within the zone should be at a price disadvantage to any other. The benefit of a common zonal tariff for the CWP is that the zonal tariff lies between the stand alone costs of transporting gas to each of the communities along the pipeline and a distance based tariff to service these communities.

A major issue with attempting to underwrite a new pipeline project with a distance based tariff is that while it has intuitive appeal (ie users only paying for the length of pipeline they utilise) it means that unless the entry tariff for users at the end of the pipeline is at or below the equivalent competing fuel price, then the pipeline will not be built to that location. This has a cascading effect, because in progressively reworking the tariffs for a pipeline to service the remaining users, these users have to bear a higher proportion of fixed costs, resulting in users no longer seeking gas, creating a price spiral. That is, the users at the end of the pipeline will face a higher tariff than the required entry tariff, so that user drops off the pipeline. This process undermines the economics of the pipeline to the point it is no longer viable.

The Code requires that the legitimate business interests of the Service Provider be taken into account[7], and the interests of Users and Prospective Users be taken into account[8]. It was a key element of the AGL Group's tender for the CWP, and its acceptance as preferred developer, that zonal pricing be offered to Users. Prospective Users of the CWP supported zonal pricing. The tender and the commitment by the AGL Group to the CWP occurred prior to the finalisation of the Code, and all parties acted in a reasonable expectation that zonal pricing would be accepted in the subsequent Access Arrangement for the CWP. Accordingly, the acceptance by the Regulator of zonal pricing is in the legitimate business interests of the AGLP, and in the interests of Users and Prospective Users.

[6] All tariffs in this section are in dollars of the day.
[7] Section 2.24(a)
[8] Section 2.24(f)

In light of the above, and in recognition of the fact that there is only one Reference Service being offered, it is not commercially and technically reasonable[9] to allocate revenue (or costs) to Users, other than on a zonal (ie common) basis.

2.3 Reference Tariff Structure

In the light of the matters referred to in Section 2.1, the Reference Tariff structure for the CWP during the initial Access Arrangement Period consists of a single throughput tariff. To stimulate throughput growth in the CWP, Users will pay a Reference Tariff which has the following features:

1) no load factor adjustment (which is usual for pipelines as a means to adjust throughput tariffs to reflect the pipeline capacity actually required to deliver the gas);
2) no overruns until such time as the pipeline achieves Contracted Capacity of 85%; and
3) no minimum annual bills (which usually requirement payment for a minimum annual quantity of gas being delivered).

This simple tariff structure is designed to encourage usage of the CWP as Users (and particularly inexperienced gas consumers) will know they will pay solely for the quantity of gas delivered, without having to be concerned about load management issues which could impact on their cost of gas transportation.

2.4 Cost Allocation

As discussed in Section 2.3, there is only one Reference Service being offered (ie throughput), and all costs of providing this Reference Service are fully allocated to Users by way of the zonal throughput tariff. It is not technically and commercially reasonable[10] to allocate costs to particular Users by any other means and maintain the long term viability of the pipeline.

2.5 Incentive Mechanism

The incentive structures in the Reference Tariffs are:

1) The level of Reference Tariff is determined to enable AGLP to develop the market for Reference and other Services[11]; and

2) The Reference Tariff set out in the Access Arrangement will apply during each year of the Access Arrangement period regardless of whether the forecasts underpinning the Reference Tariffs are realised.

[9] In accordance with Sections 8.38 and 8.42 of the Code.
[10] In accordance with Sections 8.38 and 8.42 of the Code.
[11] In accordance with Section 8.1(f) of the Code.

These incentive mechanisms provide an incentive to AGLP to reduce total operating costs on the one hand, and increase pipeline throughput on the other.

2.6 Other Revenue

The Reference Tariff has been designed to recover the revenue attributable to the Throughput Rate of the Throughput Service. No allowance has been made for other revenue that may accrue from any other charge incorporated in the Reference Tariff as these are not considered material.

3. CAPITAL COSTS

3.1 Asset Base

3.1.1 Depreciated Optimised Replacement Cost ("DORC")

AGLP has used the DORC methodology to value the CWP. DORC involves estimating the efficient cost of constructing the asset using current technology to meet current markets which results in the identification of the Optimised Replacement Cost (ORC) of the asset. Depreciation is then applied to the ORC to determine the DORC.

The reasons for selecting the DORC methodology include:

- the optimisation inherent in DORC allows the benefits of technology to be passed on to Users while the costs of stranded/unutilised assets are not passed on;
- it provides a consistent valuation between new and existing assets;
- it sends correct price signals as to the cost of providing the Service.

3.1.2 Optimised Replacement Cost ("ORC")

The CWP may ultimately be extended to Tamworth, and so it has been designed to accommodate, in addition to the forecast Marsden to Dubbo loads, the forecast loads between Dubbo and Tamworth. In effect the CWP has been "oversized" to enable the cost effective haulage of gas to Tamworth in the future.

Various pipeline configurations were considered which identified that on a NPV of whole of life cost basis, the required pipeline configuration between Marsden and Dubbo to service the combined Marsden to Tamworth loads is a combination of 210mm (8") and 168mm (6") pipeline. Until such time as the CWP is extended to Tamworth, it will operate in free-flow (ie no compression) conditions.

For the purposes of this Access Arrangement Information, the CWP has been redesigned to determine an optimised configuration in which the capacity installed to accommodate the load beyond Dubbo is removed and the pipeline sized accordingly. The optimised replacement cost of the CWP assets is detailed in the following table.

Optimised Pipeline and Replacement Costs

Asset Type As at 30 June 1999[12]	RC[13] $m	ORC[14] $m	Adjusted ORC[15] $m	DORC[16] $m
Transmission Pipeline	29.76	26.98	24.98	28.54
Compressor Stations:				
Rotating Equipment	Nil	Nil	Nil	Nil
Station Facilities	Nil	Nil	Nil	Nil
Regulation and Metering Stations	0.17	0.17	0.17	0.17
Odourisation Stations	0.15	0.15	0.15	0.15
SCADA and Communications	0.63	0.63	0.63	0.63
Total Asset Value	30.71	27.93	25.93	29.49

3.1.3 Valuation of non-system assets

There are no non-system assets (ie land and buildings, plant and equipment) to be added to the valuations in the above table.

3.1.4 Speculative Investment Fund

An amount of $2.78m (ie $29.76m-$26.98m) is to be placed into a Speculative Investment Fund until such time as it can be added to the Capital Base in accordance with the Code[17]. It is expected that the full amount of this fund will be added to the Capital Base of the CWP upon the construction of an extension to Tamworth.

[12] All cost information in the table is in 1999 dollars.
[13] Replacement Cost is the actual construction cost of the pipeline.
[14] The optimised configuration is a 168mm (6") pipeline from Marsden to Dubbo in free flow.
[15] The funding grant of $2m referred to in Section 1.2 is expected to be received before 30 June 1999, for regulatory purposes this money has been applied to the Initial Capital Base.
[16] Economic depreciation has been applied – refer to Section 3.1.5.
[17] Section 8.19.

3.1.5 Economic Depreciation

As is usually the case with "green-field" developments, the growth in pipeline utilisation will be a gradual process. For the CWP, this means that during the initial Access Arrangement Period forecast returns will not be sufficient to cover the total accounting expenses (including profit and depreciation) of providing the Reference Services. Accordingly there is a need for a mechanism to provide for the under-recovery of revenue in the early years of the CWP's life which can be offset against over-recovery in the later years of operation.

The concept of economic depreciation provides such a mechanism and in respect of the CWP is necessary to achieve the objective of the Code, which requires that the Reference Tariffs should be designed with a view to providing the Service Provider with the opportunity to earn a stream of revenue that recovers the efficient costs of delivering the Reference Service over the expected life of the assets used in delivering that Service[18].

Application of economic depreciation to the CWP is also consistent with the provisions of Section 8.33(a) of the Code, which provides that the depreciation schedule[19] should be designed:

> *"so as to result in the Reference Tariff changing over time in a manner that is consistent with the efficient growth of the market for the Services provided by the pipeline (and which may involve a substantial portion of the depreciation taking place in future periods, particularly where the calculation of the Reference Tariffs has assumed significant market growth and the pipeline has been sized accordingly)".*

This section of the Code recognises that such a mechanism is necessary to justify commitment to major infrastructure projects, and that this objective outweighs any argument that the ability to roll forward forecast under-recovery lessens incentives for efficiency. In addition, the Code recognises that inherent in investment in pipelines is a significant market risk of growing an undeveloped gas market, as is the case for the CWP.

3.1.6 Working Capital

A return on the working capital of $10,000 has been allowed for in the project cash flows.

[18] Section 8.1(a).
[19] Application of depreciation principles to the IRR/NPV methodology is addressed in Section 8.34 of the Code, which includes reference to Section 8.33.

3.1.7 Economic Life and Remaining Economic Lives

Based on AGLP's experience as a major owner and operator of pipelines in Australia together with various recent access arrangements proposed by service providers, submissions of industry participants and decisions of Regulators, economic lives for the various assets making up the CWP have been established. These are set out in the table below together with the average remaining economic life of each of the asset classes making up the CWP.

Table Asset Economic Lives (from installation and remaining years)

Asset	**Economic Life (years)**	**Average Remaining Economic life (1 July 1999) (years)**
Transmission Pipelines (coated and CP protected):		
Constructed pre 1970	60	N/A
Constructed post 1970	80	79
Compressor Stations:		
Rotating Equipment	25	N/A
Station Facilities	35	N/A
Regulation and Metering Stations	50	49
Odorising Stations	35	34
SCADA	10	9
Plant and equipment	5-20	N/A
Buildings	50	N/A

3.1.8 Forecast and Committed Capital Expenditure

Capital expenditure for a pipeline system comprises two components:

1) capacity expansion and system replacement; and

2) non-pipeline system expenditure (plant and equipment etc).

As there are no non-system assets included in the capital base for the CWP, there is no non-system capital expenditure forecast.

For the CWP, there is no committed capital expenditure, with the only capital expenditure forecast being that to replace minor pipeline components (ie "stay in business" capital expenditure). Such components would include replacement and upgrading of:

- instrumentation - metering, telemetry remote terminal units etc;
- pipeline hardware – valves, regulators and fittings etc;
- minor site capital improvements – fencing, security etc; and
- specialised major spares.

The amounts forecast for capital expenditure is confidential and not included in this Access Arrangement Information.

3.2 Rate of Return

3.2.1 WACC Approach

AGLP adopted a weighted average cost of capital (WACC) approach as a guide to determining the appropriate rate of return for the CWP. This approach is similar to that used in recent regulatory decisions relating to gas industry infrastructure in Victoria and New South Wales.

In October 1998 the ACCC's decision concerning the Victorian gas transmission system held that 7.75% is a reasonable real pre-tax WACC for mature large scale gas transmission infrastructure in Victoria. This decision was reached following significant public debate as to the nature of the WACC approach and the nature and value of the variables used in calculating WACC. AGLP believes that the Victorian outcome should be taken into account in determining the WACC for the CWP.

3.2.2 Application of WACC to CWP

The Code provides that the rate of return to be used in determining a Reference Tariff should provide a return which is commensurate with prevailing conditions in the market for funds and the risk involved in delivering the Reference Service (as reflected in the terms and conditions on which the Reference Service is offered and any other risk associated with delivering the Reference Service)[20]. The ACCC decision can reasonably be considered as a benchmark for prevailing conditions in the market for funds - it is then necessary to consider the extent to which the risks involved in delivery of the Reference Services for the CWP are materially different from those involved in the Victorian infrastructure.

Firstly, the Victorian decision appears to have been substantially completed before the full impact of the Longford gas plant incident was known, hence it is unknown whether the risks to service providers highlighted by this incident were fully incorporated into this regulatory.

Secondly, the risks involved in the CWP are considerably greater than the risks involved in the Victorian transmission system due to the following factors:

[20] Section 8.30.

- the general uncertainty surrounding the CWP due to the fact that it only recently commenced operation, and unlike many other pipelines had no foundation Users to underpin the pipeline economics[21];
- the much lower level of maturity of the CWP's markets (this pipeline only commenced operation in June 1998 and has not yet established markets);
- the much smaller size of the CWP;
- the greater concentration of usage among several (relatively) large consumers connected into the CWP (it is expected that the three largest end-users of gas in the region will account for approximately 25% of pipeline throughput but as yet not all of these customers have entered into a binding gas supply agreement; and
- the significantly higher city gate price for gas in the Central West region than in Victoria resulting in higher delivered prices to consumers and consequent greater exposure to competing energy options.

To account for these factors a higher cost of equity can be expected.

Thirdly, to a large degree the risk inherent in a pipeline depends on the risk attributable to the end-users which it serves. The large end-users of the CWP are concentrated in agricultural processing, publishing and other resource processing and are typically small by national standards, but nevertheless exposed to both international market and climatic fluctuations.

Asset betas are an accepted measure of specific industry risk, and the asset betas of possible relevant industry groupings of end-users are shown below:

Industry	**Asset Beta**
All industrials	0.65
Diversified industrials	0.71
Diversified resources	0.90

In using the WACC approach, the WACC calculation should be used as a guide to identify a range in which a reasonable rate of return may be expected to lie. The selection of a final WACC then relies on consideration of other factors and the exercise of judgment to best meet the objectives of the Code. Determination of precise values for the relevant parameters to be used in the various WACC calculations is recognised as problematic.

3.2.3 Range of Variables

The ranges of major variables in the WACC calculation are outlined in the table below. Consideration of these parameters will establish a range within which a reasonable WACC could be expected to lie.

[21] The effect of the Code has reduced the appropriateness of pipeliners entering into foundation contracts in that foundation contracts are taken into consideration by the Regulator but are not binding on the regulator.

AGLP has based its WACC calculations on a range of debt equity ratios from 60:40 debt to equity to 50:50 debt to equity. These ratios, combined with the parameters outlined in the table below, may be expected to produce a nominal cost of equity in the range 13.7% to 17.1.0 % and a nominal cost of debt in the range 6.0% to 7.3%. In deriving this nominal cost of equity asymmetric and self insured risks were considered. These risks are not readily accounted for in the WACC — CAPM approach. Nevertheless these risks are real and have been incorporated in the upper range of the nominal cost of equity. AGLP believes any rate of return consideration should take asymmetric and self insured risk into account.

Parameter	**Value**
Inflation	2% -3%
Corporate Tax Rate	36%
Dividend Imputation Utilisation Rate	25% - 50%
10 Year Bond Rate	4.80% - 5.20%
Debt Margin	1.00% - 1.45%
2010 CPI Linked Bonds	3.20% - 3.50%
Market Risk Premium	6.0% - 7.0 %
Asset Beta	0.55 – 0.9

Using WACC calculations as a guide, combined with commercial judgment, relevant benchmark rates of return and the considerations required by the Code, AGLP has assumed that a cost of capital of approximately 10.0% pre-tax real is likely to be approved by the Regulator.

3.3 Throughput and Cash Flow Projections

Throughput and cash flow projections over the economic life of the CWP are confidential and not included in this Access Arrangement Information.

4. NON-CAPITAL COSTS: OPERATIONS AND MAINTENANCE AND OVERHEADS AND MARKETING

Forecasts of non-capital costs have been developed by AGLP for the five years to 30 June 2004. As discussed in this section, such forecasts have been established in the light of operations and maintenance activities being provided on a contract basis, with general, administration and marketing costs provided to AGLP as a corporate service from the AGL Group.

4.1 Operations and Maintenance Costs

Operation and maintenance activities for the CWP are to be performed under contract by EAP Operations Pty Limited (EAPO) which also performs such activities on the Moomba to Sydney pipeline. The efficiency of the operating and maintenance costs incurred under this arrangement are discussed in Section 6.

As the CWP has only been recently constructed and is only part way through its first full year of operation, there are no historical financial data available to compare forecast operations and maintenance costs. Operating and maintenance costs are based on actual costs expected to be incurred over the Access Arrangement Period. There has been no allowance for contingency, and in respect of the operations and maintenance costs over the life of the CWP, infrequent but recurring costs (eg intelligent pigging) have been accounted for in the cash flow analysis in the year in which they are expected to occur.

Forecast operations and maintenance costs for the Access Arrangement Period are confidential and not included in this Access Arrangement Information.

No allowance has been made for system use gas in the operations and maintenance costs, since system use gas will be provided by the user[22] (refer to Schedule 3, Part 1 of the Access Arrangement).

4.2 Overheads and Marketing Costs

The cost of corporate services provided to AGLP in order to both operate the CWP and market its services are confidential and not included in this Access Arrangement Information. These services include:

- Administration and General (including insurance, regulatory affairs, compliance, personnel and training, legal, accounting, taxation and government levies; and
- Sales and Marketing.

[22] Refer to Schedule 3, Part 1 of the Access Arrangement.

4.3 Fixed versus Variable costs

Operating and maintenance costs of the CWP will not vary with throughput during the Access Arrangement Period.

4.4 Cost Allocation

All of the operating and maintenance costs are direct costs and will be applied to all Users in the single zone applying under the CWP Access Arrangement. Overheads and marketing costs will be applied on the same basis. There is no regulated/unregulated differentiation of Users.

5. SYSTEM CAPACITY AND VOLUME ASSUMPTIONS

5.1 General

This section provides details relating to the technical specifications and throughput assumptions of the CWP. As the CWP has only been recently commissioned, its design specification provides an appropriate description.

The CWP is designed for a maximum operating pressure of 10.2MPa. The pipeline is 219.1mm (8") for the southern 130km to Alectown (near Parkes) and 168.3mm (6") outside diameter for the remaining 125km.

The pipeline steel specification is API 5L Grade X65 and X52 (in accordance with API Specification for Line Pipe, API Spec 5L). Pipeline wall thickness design has been determined in accordance with the Pipeline Code AS2885. A brief summary of technical details associated with the CWP is a follows:

Applicable Code	AS2885-1997	
Maximum allowable operating pressure (MAOP)	10,200 kPa (class 600)	
Steel grades	API 5L X52 and X65	
Diameter and Wall thickness	168.3mm	4.8mm – 50% SMYS 6.4mm – 40% SMYS
		and
	219.1mm	5.0mm – 50% SMYS 6.4mm – 40% SMYS
Length	255km	
External coating	high density polyethylene – 1.2mm thickness	
Internal coating	epoxy	
Depth of cover	1200mm in roads and most locations	
	5000mm for directional drills 2000mm under rails and 1200 under rail reserve 900mm in private property	
Marker tape	in designated areas (built up areas, road crossings etc)	
Concrete coating	at watercourses and flood plains	

Concrete slabs	under table drains on road crossings
Valve coating	Intertuff UHB over 2.5 blast clean
Joint coating	Polyken 943-30 (inner) and 955-20 (outer) tape

- Five off-take points (off-take and valve) supply reticulation systems in Forbes, Parkes, Narromine, Dubbo and Dubbo West.
- An extension to the existing off-take station near Marsden, incorporating metering, line valve and scraper station and a new odourant facility.
- Scraper stations near Alectown West and at the Dubbo end site.
- Additional above-ground valve sites at average 27km intervals.
- Pipeline markers and cathodic protection test points at intervals throughout.

5.2 Map of CWP and Pipe Specification

A map of the CWP Route is attached as Attachment 3.

Pipe sizes, lengths and delivery capability is set out in the tables below:

Pipeline Section	Diameter (mm outside)	Length (km)
Marsden off-take to Alectown Scraper Station	219.1	130
Alectown Scraper Station to Dubbo	168.3	125

Maximum Delivery Capability (Marsden inlet pressure = 4000kPa, free flow conditions)	10.1 TJ/d

5.3 Average Daily and Peak Demands

Average and peak daily flow rate data is confidential and not included in this Access Arrangement Information.

5.4 Forecast Load Across Each Pricing Zone

Forecast average daily, peak and total pipeline load for the Access Arrangement Period are confidential and not included in this Access Arrangement Information. There is only one pricing zone for the CWP.

5.5 System Load Profile by Month

Given the CWP has very little operational history, the monthly load profile is based on forecast loads. In addition, as the forecast loads vary significantly, the load profile is presented in terms of percentages.

Month	**% of total Annual Load**
January	4.9
February	6.4
March	6.7
April	8.5
May	10.1
June	10.8
July	11.6
August	11.2
September	9.6
October	7.5
November	7.1
December	5.6
Total	**100**

5.6 Numbers of Users on the CWP as at December 1998

Number of Users	1

6. EFFICIENT COSTS AND PERFORMANCE MEASURES FOR PIPELINES

6.1 Introduction

(a) Objective of Demonstrating Efficient Costs

The Code provides that a Service Provider's Reference Tariff and Reference Tariff Policy should be designed to provide the Service Provider with the opportunity to earn a stream of revenue that recovers the efficient cost of delivering the Reference Service[23] and that costs be those incurred by a prudent Service Provider acting efficiently, in accordance with accepted and good industry practice to achieve the lowest sustainable cost of delivering the Reference Service[24].

(b) Issues Relating to Performance Measures and Benchmarking of Transmission Pipelines

The ACCC in its Final Decision on the access arrangements submitted by Transmission Pipelines Australia (TPA):

> *"recognises the challenges in identifying KPIs and benchmarks especially in a newly deregulated environment such as the Victorian natural gas industry"*[25]

These same challenges will continue to exist throughout the Australian gas transmission industry until such time as there is sufficient meaningful information relating to performance in the public domain. In addition to the difficulty of identifying KPIs and benchmarks, there are further challenges to be overcome in working up meaningful comparisons of the performance of individual pipelines in the industry including:

- Prior to now there has been only limited publicly available information (mostly from Government owned entities many of which have now been privatised),
- Privatisation within the industry has meant private companies have declined to release performance indicators on the basis of commercial sensitivity and restrictions on disclosure, and
- Difficulty of "normalising" pipelines to yield meaningful comparisons due to extremely diverse characteristics of pipelines (eg size, length, geography and topography of location, operational characteristics etc).

Nevertheless, it is recognised that it is necessary for the regulator to benchmark performance, despite these very real difficulties. In this context, whilst the performance data presented is necessarily at a high level and of limited scope, it will contribute to the development of meaningful industry performance measures over time.

[23] Section 8.1(a).
[24] Section 8.37.
[25] Victorian Gas Transmission Access Arrangements Final Decision, 6 October 1998, p. 157

(c) **Tariff Setting and Performance Measures**

Before performance indicators can be used to benchmark operating efficiency, an appropriate range of such measures must be developed for comparable pipelines in relation to the service offered. While it is anticipated that such measures will be developed over time to suit the Australian industry, they are not currently established.

Therefore, performance comparisons presented have not been used to set or establish tariffs, but rather to demonstrate that AGLP is operating the CWP in an efficient and prudent manner.

6.2 Cost Structure of Pipelines

Operating pipelines is a capital intensive industry. As a general rule, some 80 –90% of annual accounting costs of operating a pipeline are attributable to capital related expenses in the form of depreciation and EBIT.

Annual accounting costs attributable to operating and maintenance costs make up the balance – some 10-20%.

6.3 Performance Measures for Pipelines

6.3.1 Capital Costs

As capital related expenses represent 80-90% of annual accounting costs, the cost of constructing the pipeline is clearly the dominant cost and therefore the most important to measure. However, to enable a comparison of construction costs, it is necessary to adjust the costs to take into account the factors driving capital costs, such as:

- surface conditions – bare, forest,
- soil type and condition – rock, sand,
- remoteness – urban, rural,
- type of steel – for example high tensile yields lower capital expenditure,
- price of steel – steel prices have dropped some 20% over the last year (steel makes up some 30% of installed cost of pipelines),
- delays – approvals, land title, weather etc.

It is difficult to “normalise” these factors between various pipeline construction costs to allow meaningful comparison.

Given these difficulties, an industry accepted measure of pipeline installation cost efficiency is $/Millimetre/km. Throughput related measures (eg $/GJ or $/GJ/km) are poor measures of efficiency because of potential distortion due to differences in economies of scale between different sized pipelines and they ignore the effects of load factors and the level of utilisation of the pipeline.

6.3.2 Operating Costs

Even though operating and maintenance costs drive a minor portion of annual pipeline costs, the range of activities required to operate and maintain a pipeline are, like capital costs, affected by a series of pipeline specific factors including:

- terrain; river, road and rail crossings etc,
- remoteness,
- age of pipe,
- condition of coating,
- type of steel,
- rotating equipment (eg compressor stations).

Given these factors, industry accepted measures of pipeline operating and maintenance efficiency include:

- $/km,
- direct pipeline O&M expense/replacement cost of pipeline, and
- direct pipeline rotating equipment O&M expense/replacement cost of rotating equipment.

As with capital costs, throughput related measures ($/GJ or $/GJ/km) are poor indicators of efficiency for the same reasons applicable to capital costs.

6.4 Key Performance Indicators

6.4.1 Australian Comparisons

6.4.1.1 Capital Costs

The table below is data extracted from a paper "Australian Transmission Pipeline Costs" presented at the 1998 Australian Pipeline Industry Association (APIA) Convention[26]. The table lists those pipelines not dissimilar to the CWP in length and diameter and expresses the capital cost[27] on a $/mm/km basis.

[26] The paper is authored by Philip Venton of Venton and Associates.
[27] In the original paper, costs were in 1995 dollars (quarter not stated), these have been adjusted to September 1998 dollars from an assumed September 1995 base.

Pipeline	When Constructed	Length (km)	Diameter[28] (mm)	Unit Cost $/mm/km
Mereenie to Alice Springs	1985	270	200	730
Young to Lithgow	1987	212	150	1115
Canarvon Lateral	1988	171	150	719
Whyalla Lateral	1989	71	200	1212
Gladstone to Rockhampton	1991	96	200	957
Junee to Griffith	1993	170	150	805
Marsden to Dubbo	1998	130 125	200 150	620

The unit cost figures presented in the table above suggest that capital applied to the construction of the CWP has been utilised efficiently.

6.4.1.2 Total Operating Costs[29] - Actual

As noted in Section 4, AGLP will operate the CWP on the basis of direct operations and maintenance being performed under contract by EAPO with general administration and marketing requirements provided to AGLP as a corporate service.

6.4.1.3 Total Operating Costs – Stand Alone

On the basis of our experience as a major owner and operator of transmission pipelines in Australia, our assessment of a stand alone organisation to operate the CWP is that an equivalent of around 10 people would be required. In addition, such a stand alone organisation would incur significant costs associated with providing:

- offices and a field depot,
- vehicle and tools necessary for operating and maintaining the pipeline and associated systems,

[28] Outside diameters used in analysis.

[29] In this section on efficient costs, unless otherwise specified, "total operating expense" includes all non capital costs associated with operating a pipeline (ie operation and maintenance, marketing, general and administration expenses) and excludes profit and depreciation.

- SCADA, telemetry and control facilities, and
- sub-contracting of specialist services such as payroll, legal, training, superannuation, auditing, project engineering, etc.

Based on our experience a budget for such a stand-alone pipeline operation would be in excess of $1.2m per annum.

6.4.1.4 Total Operating Costs - Indicative Based On Experience

From AGLP's experience in constructing and operating pipelines, indicative "rules of thumb" have been developed which are used to forecast total operating costs in investigating new pipeline opportunities. Whilst acknowledging that applying generalised averages to establish a total operating cost is somewhat subjective it nevertheless provides an indication of what operating costs can be expected under "average" conditions to be incurred in operating pipelines. These are set out in the table below.

Indicative Total Pipeline Operating Expenses as a Percentage of Asset Replacement Cost

Asset	Average	Large Pipeline	Small Pipeline
Pipeline	2%	1.5%	2.5%

Asset	Average	Multiple Units	Single Unit
Compressors[30] (gas turbines)	6%	5%	7%

6.4.1.5 Total Operating Cost – Comparison with TPA

The most recent publicly available total operating cost information is that of TPA[31] whose transmission system includes compression. Applying the indicative measures above to TPA's total operating expense is set out in the table below

[30] Excluding fuel gas cost.
[31] Transmission Pipelines Australia Pty Ltd Access Arrangement dated 3 November 1997

TPA Total Operating Cost ($m) – 1998

	Replacement Cost	AGLP Indicative Measure applied	Indicative Operating cost	Actual TPA forecast operating cost
Pipeline Direct	581.7	2%	11.7	N/a
Compression	60.8	6%	3.7	N/a
Total			**15.4**	**19.5**

Assuming the indicative operating cost attributable to compression is correct, then operating cost attributable to the pipeline component of TPA is around $15.8m (ie $19.5m – $3.7m) which is 2.7% of replacement cost.

A comparison of total operating cost using AGLP's indicative measure with TPA's forecast as applied to both the TPA and the CWP is set out in the table below.

Comparison of Operating Costs ($m) by Applying AGLP Indicative Measure and TPA Forecast

	Replacement cost	AGLP indicative measure 2%	TPA forecast 2.7%
TPA	581.7	11.7	15.8
CWP	30.71	0.61-0.77[32]	0.83

The above analysis, whilst not being based entirely on precise information does suggest that a reasonable cost of operating the CWP is within the range $770,000 – $1,200,000 per annum.

6.4.1.6 Total Operating Cost – Comparison with Australian Pipelines

The table below sets out comparisons of forecast total operating costs for the CWP, TPA and a selection of (albeit somewhat dated) other Australian pipeline operators on a $m/1000 km basis. The data has been sourced from the TPA Access Arrangement[33].

[32] As CWP is a small pipeline a 2.5% measure should be applied to compare like with like.
[33] Escalated to 1999 dollars where appropriate.

Company	AGLP	TPA	TPA	AlintaGas	Pipeline Authority	PASA
State	NSW	VIC	VIC	WA	NSW	SA
Year	99/00	99	95/6	95/6	94/5	94/5
$m/1000km	2.9 - 4.7[34]	11.0[35] – 16[36]	9.9	13.6	10.4	10.1

Even making allowance for the fact that these pipeline systems all have compression, and are very much larger than the CWP, the above comparisons point to the total operating costs for the CWP being efficient.

6.4.2 US Comparison

6.4.2.1 Capital Costs

NERA[37] has developed construction cost estimates for long distance transmission pipelines on a per diameter/km basis for various pipe diameters for use in planning purposes in North America. Given recent exchange rate volatility, a range of exchange rates between 62-78 US cents per $AUS has been applied to the NERA costs which then have been used to calculate an estimated construction cost of the CWP. The comparison is set out in the table below, in US dollars[38].

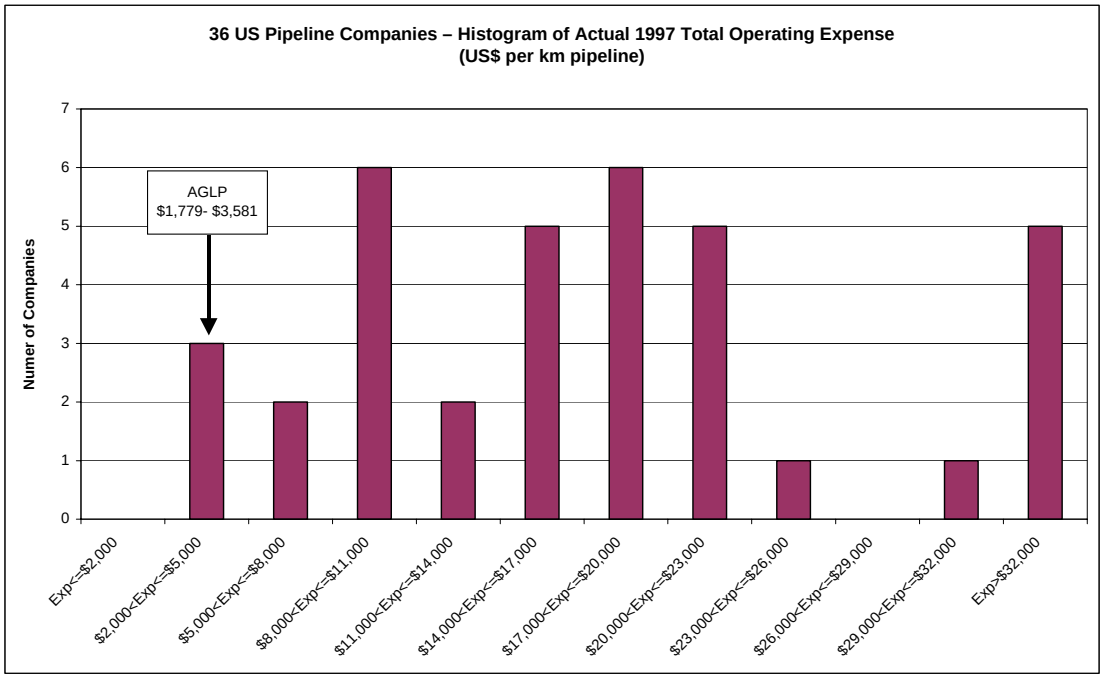
	Actual $/mm/km	NERA estimate $/mm/km
CWP	385-484	620

6.4.2.2 Operating Costs

In contrast to Australia the US has a significant amount of data publicly available on gas pipeline operating costs which is in a standard form as required by the Federal Energy Regulatory Commission (FERC). However the same problems of comparability that exist in Australia arise because of the environmental differences which affect costs between each pipeline.

[34] The forecast total operating cost is confidential and not used in this comparison. The range given is derived using the reasonable cost of operating the CWP established in Section 6.4.1.5 of between $0.77m and $1.2m.
[35] TPA Access Arrangement, 3 November 1997.
[36] Victorian Gas Transmission Access Arrangements Final Decision, 6 October 1998, p. 68.
[37] National Economic Research Associates. Private paper prepared for AGLP in 1995.
[38] Escalated to 1999 dollars.

Nevertheless, the static comparison below of total operation and maintenance expense/km of transmission pipeline provides useful insight into the efficiency of AGLP[39] in operating the CWP when compared to a range of US pipelines. It is noted that the US pipelines in the comparison tend to be very large by Australian standards and probably all having compression. Data on the US pipelines has been sourced from the 1997 FERC filings of 36 pipeline companies[40].



[39]The forecast total operating cost is confidential and not used in this comparison. The range given is derived using the reasonable cost of operating the CWP established in Section 6.4.1.5 of between $0.77m and $1.2m. The range in the chart is the maximum variation due to the exchange rates noted in Section 6.4.2.1.

[40] Refer to Attachment 2 for a listing of the 36 companies and notes on the compilation of the US data.

ATTACHMENT 1

CATEGORIES OF INFORMATION TO BE DISCLOSED AS PART OF THE ACCESS ARRANGEMENT INFORMATION

Category in Access Code	Reference in the Access Arrangement Information
Category 1: Information regarding Access & Pricing Principles	
Tariff determination methodology.	2.2
Cost Allocation approach.	2.4
Incentive structure.	2.5
Category 2: Information regarding Capital Costs	
Asset values for each pricing zone, service or category of asset.	3.1.2
Information as to asset valuation methodologies – historical cost or asset valuation.	3.1.1/3.1.2
Assumptions on life of asset for depreciation.	3.1.7
Depreciation.	3.1.5
Accumulated depreciation.	3.1.5
Committed capital works and capital investment.	3.1.8
Description of nature and justification for planned capital investment.	3.1.8
Rates of return – on equity and on debt.	3.2.3
Capital Structure – debt/equity split assumed.	3.2.3
Equity returns assumed – variables used in derivation.	3.2.3
Debt costs assumed – variables used in Derivation.	3.2.3
Category 3: Information regarding Operations and Maintenance Costs	
Fixed versus variable costs.	4.3
Cost allocation between zones, services or categories of asset & between regulated and unregulated.	4.4
Wages & Salaries – by pricing zone, service or asset category.	4.1
Cost of services by other including rental equipment.	4.1
Gas used in operations – unaccounted for gas to be separated from compressor fuel.	4.1
Materials and supply.	4.1
Property Taxes.	4.1
Category 4: Information on Overheads & Marketing Costs	
Total service provider costs at corporate level	4.2
Allocation of costs between regulated and unregulated segments.	4.4
Allocation of costs between particular zones, services or categories of asset.	4.4

Category in Access Code	Reference in Access Arrangement Information
Category 5: Information regarding System Capacity & Volume assumptions	
Description of system capabilities Map of piping system – pipe sizes, distances and maximum delivery capability.	5.1, 5.2, Attachment 3
Average daily and peak demand at "city gates" defined by volume and pressure.	5.3
Annual volume across each pricing zone, service or category of asset.	5.4
System load profile by month in each pricing zone, service or category of asset.	5.5
Total Number of customers in each pricing zone, service or category of asset.	5.6
Category 6: Information regarding Key Performance Indicators	
Industry KPIs used by The Service Provider to justify "reasonable incurred" costs.	6.3
Service provider's KPIs for each pricing zone, service or category of asset.	6.4

ATTACHMENT 2

COMPILIATION OF US DATA FOR COST COMPARISION

2.1 Companies Included in Cost Comparison

The table below identifies the pipeline companies which have been included in the cost comparison study.

1	ANR Pipeline Co	21	PG&E Gas Transmission Northwest Corp
2	Black Marlin Pipeline Co	22	Questar Pipeline Co
3	Chandeleur Pipeline Co	23	Sabine Pipeline Co
4	Columbia Gulf Transmission Co	24	Sea Robin Pipeline Co
5	East Tenessee Natural Gas Co	25	Stingray Pipeline Co
6	El Paso Natural Gas Co	26	Tenessee Gas Pipeline Co
7	Florida Gas Transmission Co	27	Texas Eastern Transmission Corp (Tetco)
8	Great Lakes Gas Transmission LP	28	Texas Gas Transmission Corp
9	High Island Offshore System	29	Trailblazer Pipeline Co
10	Iroquois Gas Transmission LP	30	Transcolorado Gas Transmission Co
11	K N Interstate Gas Transmission Co	31	Transwestern Pipeline Co
12	Kern River Gas Transmission Co	32	Trunkline Gas Co
13	Midwestern Gas Transmission Co	33	U-T Offshore System
14	Mojave Pipeline Co	34	Viking Gas Transmission Co
15	Mississippi River Transmission Co	35	Williams Gas Pipelines Central
16	Mobile Bay Pipeline Co	36	Wyoming Interstate Co Ltd
17	Northern Border Pipeline Co		
18	Northern Natural Gas Co		
19	Overthrust Pipeline Co		
20	Panhandle Eastern Pipeline Co		

2.2 Company Selection Criteria

Initially some 75 companies were identified from FERC filings as being “pipeline” companies. However, as some of these companies are integrated businesses which could include production, storage, transmission and distribution activities a filtering process was applied to identify those companies whose dominant business activity was transmission.

This filtering process identified 36 companies whose core business is transmission, and whose other activities (ie production, storage and distribution) make up a minor portion of total operating costs.

2.3 Operation and Maintenance Expense

In the cost comparison, only the operation and maintenance expense for transmission activities were included (ie any operation and maintenance expense allocated to production, storage or distribution have been deleted).

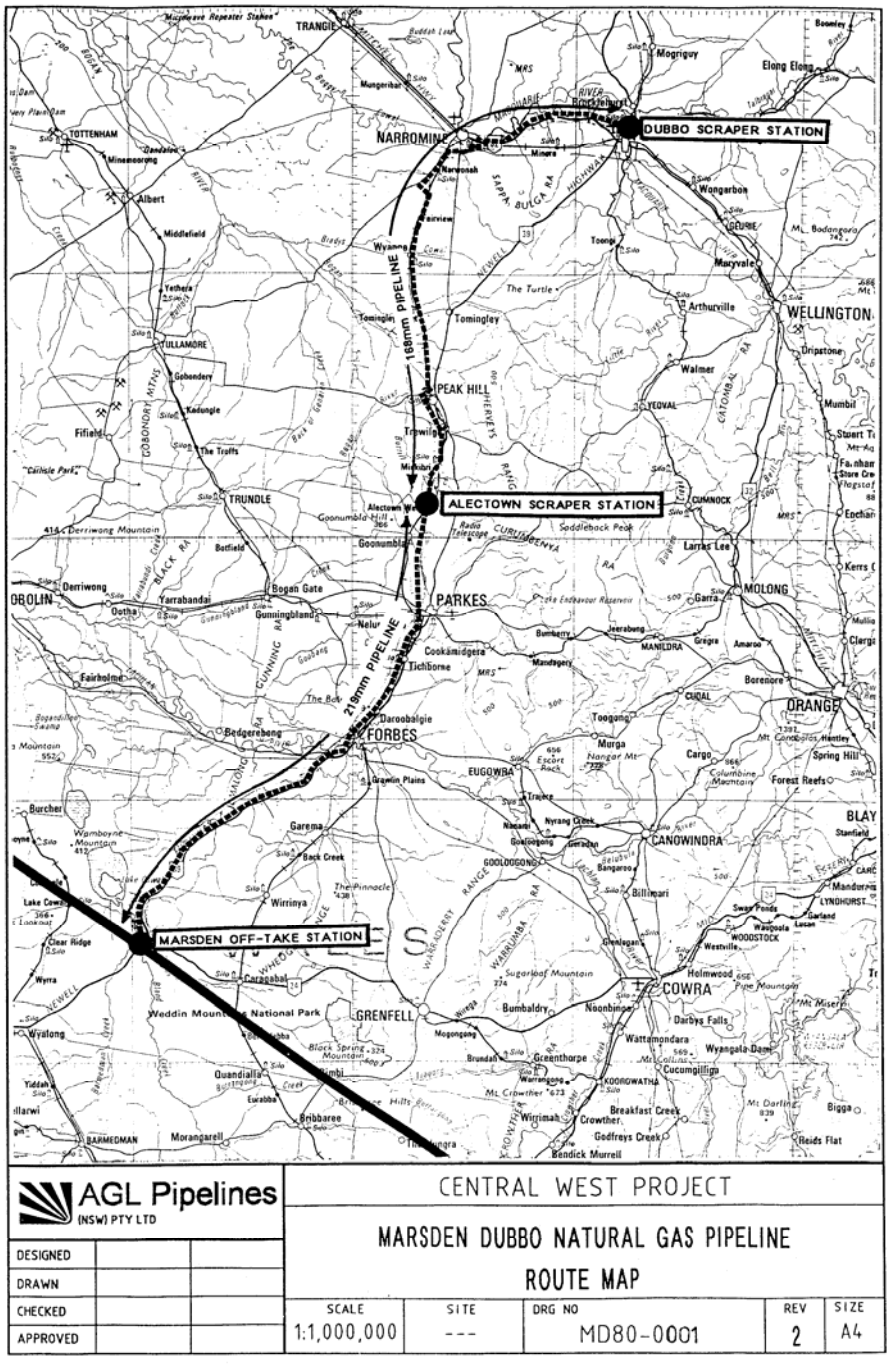
2.4 Marketing and Overhead Expenses

The FERC requires operating and maintenance cost data to be allocated to each of a company's operating activities, however this doesn't apply for marketing and overhead expenses[41]. Because marketing and overhead expenses are not allocated to separate operating activities, the share of these expenses to each of the operating activities can not be determined. This means that the marketing and overhead expenses used in the cost comparison are for the total business, however because transmission activities of the companies selected are dominant, any overstating of marketing and overheads expense would be minimal, and have no impact on the conclusion drawn from the US/AUS comparison that the CWP is being operated efficiently.

[41] Includes Customer Accounts, Customer Service, Sales, General and Administration expenses

ATTACHMENT 3

MAP OF CENTRAL WEST PIPELINE ROUTE



AGLP - Central West Pipeline