REVIEW OF THE DEPRECIATED OPTIMISED REPLACEMENT COST OF THE ALLGAS NATURAL GAS DISTRIBUTION NETWORK

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Summary

Brown & Root Services Asia Pacific Pty Ltd (Brown & Root) has been commissioned by the Queensland Competition Authority to undertake an independent review of the valuation by Allgas Energy Limited (Allgas) of its gas distribution networks in Southern Brisbane, South Coast, Toowoomba and Oakey.

Gutteridge Haskins & Davey Pty Ltd (GHD) was commissioned by Allgas to complete a valuation on the basis of a Depreciated Optimised Replacement Cost (DORC) methodology using Modern Engineering Equivalents (MEE). Brown & Root has reviewed the data used for this valuation, including the methodologies and assumptions used. The methods, assumptions and rates used are found to be sound and appropriate, and the valuation has been completed to a good to high (ie $\pm 20\%$) level of accuracy—given the limitations of Allgas' historical records.

In optimising the system, GHD has adopted the following:

- use of historical information as best provided by Allgas to determine lengths and sizes of gas supply mains. The information was subject to an independent review by GHD before being presented to Brown & Root, and ultimately adopted into the valuation;

- substitution of modern materials of construction for the piping network, and use of 'industry standard' sizes for take-offs to industrial, commercial, and domestic consumers. Current materials of construction—steel and polyethylene—were considered in lieu of the older cast iron system. This substitution enabled the use of smaller diameter lines, and the removal of various gate and regulator stations;

- use of standard construction rates for the various materials and sizes. These rates were compiled from GHD's historical database, and have incorporated factors for the various ground conditions in the four major locations;

- use of insertion as a means of replacing mains with modern day equivalents. Insertion has been adopted on lines where overall construction costs are lower. The difference in construction costs between trenching and burial, and insertion has been incorporated into the valuation for depreciation purposes by application of a residual value for the 'hole in the ground'. This residual value, in the form of a trench value, has been applied as a limit for depreciation in areas where it is greater than the asset's remaining useful life depreciated value;

- an optimisation of the network based on future growth over the next five years. Growth has been determined by review of growth rates over the last five years;

- use of remaining material useful lives for depreciation as opposed to remaining economic life, as the economic life is unlikely to be less than material useful lives. The status of current and future gas supplies to the Allgas network supports this preference.

The depreciation calculations performed by GHD appear to be consistent with Brown & Root's own calculations (based on GHD-supplied data)—with the exception of rounding errors. The depreciated values are based on remaining life of the existing material as opposed to remaining economic life. This methodology is more conservative and results in a lower DORC valuation.

The DORC value as estimated by Allgas is currently $181,403,250 inclusive of residual values.

In reviewing the valuation, Brown & Root has found some discrepancies due to rounding error of adopted mains rates. Brown & Root has also highlighted an exception to the way residual values appear to be included in the valuation model in areas where insertion has been used as opposed to traditional trenching and burial of mains and has noted no savings have been passed on.

The adoption of residual values is one that requires a ruling from the local Regulatory Body.

Brown & Root's valuation of the Allgas distribution networks is $179,156,000 and includes insertion savings, zero residual values, and a 5% remaining useful life for assets which have exceeded their useful life, but are still in service. GHD originally applied 5 years to this value.

1 Introduction

1.1 TERMS OF REFERENCE

In June 2000, Brown & Root was engaged by the Queensland Competition Authority (QCA), to conduct progressive reviews of the data provided by Allgas of the valuation of its gas distribution networks in Southern Brisbane, Toowoomba, Oakey and South Coast. This series of progressive reviews was designed to highlight any concerns and reach agreement (in principle) on the methodology and pricing used in supplying a Depreciated Optimised Replacement Cost (DORC) of these networks based on Modern Engineering Equivalents (MEE). Depreciation of the networks takes into account the respective ages and remaining technical and economic lives of assets. The optimised replacement cost of the networks considers any benefit that may arise from optimisation, including technical improvement and the redesign of the system to exclude redundant assets.

This document has been compiled for public access. Certain elements of the original report have been removed due to confidentiality requirements.

1.2 AVAILABLE INFORMATION

Brown & Root based its work on information provided by Allgas and GHD, supplemented by its own experience, knowledge, and calculations. Data on the networks, as used by GHD, was initially supplied by Allgas for review by GHD.

Supporting data was obtained from recent submissions on the relevant gas networks in New South Wales, Victoria and South Australia.

2 Scope

This report includes the areas of:

- Southern Brisbane
- South Coast (i.e. Southern Brisbane to Gold Coast)
- Brisbane to South Coast Sub-transmission main
- Oakey
- Toowoomba.

The valuations allow for materials, equipment, installation, supervision and testing to replace mains, services, meters, regulators, and gate stations servicing all domestic, commercial and industrial users within the boundaries of these areas.

The main transmission line to the Gold Coast is included. Areas with bottled LPG gas serviced by Allgas are excluded.

3 Assessment of Allgas DORC

3.1 BACKGROUND

The Allgas assets were valued by Gutteridge Haskins & Davey Pty Ltd (GHD) at June 1999—in conjunction with Allgas Operations personnel. This work was undertaken as part of the requirements of the *Gas Pipelines Access (Queensland) Act 1998*.

During the compilation of this report, Brown & Root progressively reviewed the methodology and the data as provided by GHD. The methodology adopted by GHD consisted of:

- verification of quantities of assets
- determination of asset lives
- completion of asset system optimisation
- determination of unit (MEE) replacement costs and variables
- determination of depreciated optimised replacement cost.

Each of the above approaches is examined below.

3.2 INCUMBENT OWNER VERSUS NEW ENTRANT ASSET VALUATION

There are two positions to consider when determining asset replacement cost of a network: those of an 'Incumbent Owner', and those of a 'New Entrant'.

A New Entrant is defined as a business installing a new gas reticulation network in an existing area where no network owned by the New Entrant exists. In this situation there are no existing easements, pipelines, network layouts, etc. Costs incurred would include all project management, design, easement, construction and restoration costs.

An Incumbent Owner is defined as a business already owning a gas reticulation network. Such a business would already have in place established easements, network plans, pipelines and connections, etc. This business would have available, for replacement purposes, insertion technologies that lead to cost savings. While this can be considered a well-accepted MEE approach for existing mains and services, there may exist physical constraints limiting the feasibility of insertion in certain situations.

The unit rates applicable for a New Entrant will be significantly greater than the equivalent Incumbent Owner unit rates (where insertion is technically feasible). Principal differences include:

- greater design requirement for a New Entrant;
- greater easement location and identification costs for a New Entrant;

- greater restoration costs for a New Entrant;
- engineering requirement for service installations for a New Entrant.

Allgas has Incumbent Owner status for this valuation and, as such, is able to take advantage of optimising an existing network with modern engineering materials (such a polyethylene), construction techniques (such as insertion), and other benefits as described above. Allgas' valuation, however, does not reflect costs savings in the unit rates.

This is further discussed in Section 5.

3.3 VERIFICATION OF QUANTITIES OF ASSETS

GHD obtained the majority of the asset data from Allgas' GIS system and consumer database (ASIS) as at June 1999. The Allgas asset data was not complete given the age of the network and the fact that significant information was lost in the 1974 Brisbane flood.

Allgas' network details were compiled from existing maps, plus electronic data available from 1995 onwards. The existing 4-chain maps were used to assist in details of the network. Both Allgas Operations and GHD reviewed the electronic data against the 4-chain maps for completeness and accuracy.

The maps audited represented 17% of the Brisbane network. The Brisbane network represents 70% of Allgas' gas distribution.

Services were estimated based on ASIS information to obtain accurate numbers.

Given the limited amount of information available, the methods adopted by GHD to estimate mains and services assets appear reasonable for this exercise.

3.4 COMPLETION OF ASSET SYSTEM OPTIMISATION

GHD has used data from previous studies to adopt a set of industry standards to be used for MEE. The forecast demand loads were based on an analysis of historical growth, which showed a linear increase in gas distribution demand.

Allgas' network is separated into a high-pressure system and a low–medium pressure system. Brown & Root has held discussions with GHD and Allgas to review the approach, methodology and standards used. The results of this analysis are considered acceptable.

The optimisation process has provided no reduction in mains length, however diameters of mains and services have reduced. Meters and gate stations are unaffected. Sub-gate station and district regulator numbers have reduced.

Asset system optimisation is covered in more detail in Section 4.

3.5 MEE AND UNIT REPLACEMENT COSTS AND VARIABLES

The modern engineering equivalents (MEE) used by GHD to determine mains, services and meter sizes, and materials of construction are valid. The unit rates used for construction account for the ground type and density of development, and are considered reasonable for direct burial construction.

This is covered further in Section 5.2.

3.6 ASSET LIVES

GHD has adopted a set of material useful lives in conjunction with Allgas' operational experience. These material lives were based on remaining useful material life which, for this network, is less than predicted economic lives.

GHD has adopted a technical life of 105 years for protected steel mains and eighty years for polyethylene.

The age of the assets was estimated based on 'best available' records and Allgas Operations input.

Asset lives are discussed in further detail in Section 5.3.

3.7 DETERMINATION OF OPTIMISED DEPRECIATED REPLACEMENT VALUE

GHD estimated the depreciated optimised replacement cost of the Allgas gas network as $181.4 million. Brown & Root's checking of the valuation has resulted in a lower figure of $180.9 million (without insertion savings).

The network age varies based on location, hence depreciation variance is quite large. The older cast iron pipes have reached their useful life and have been replaced by PE piping as part of the MEE approach to optimisation.

The replacement (RC), optimised replacement (ORC) and depreciated optimised replacement (DORC) costs are displayed in Table 5.4 of this report.

4 Optimisation of system

The design of the Allgas gas network was reviewed to determine whether the network configuration and the diameters of the installed pipes are 'optimum' for the system loads identified for year 2001.

4.1 INFORMATION PROVIDED

GHD has provided a consistent flow of information regarding network details and associated consumer numbers and demand loads. Where information could not be 'handed over' it was presented for Brown & Root's review at various meetings. The information included:

- maps of the network areas defining appropriate boundaries. Existing chainage maps of the South Brisbane area were presented for review;
- detailed listing of the meter services to verify reasonable estimate of consumer numbers;
- presentation by Allgas and GHD on the history of its gas network, its engineering and operational philosophies, and justification for decisions made during the optimisation process.

4.2 BACKGROUND

The Allgas gas network is divided into three Natural Gas operating regions—Brisbane, Western region and South Coast.

Each region commences at one or more gate stations, which receives, meters and odorises natural gas from the main transmission line operator. Gas flows from gate stations to the high pressure supply systems (pressures from 1,200 kPag to 7,000 kPag). Gas is then fed to the low–medium pressure systems (pressures up to 200 kPag) via a series of sub-gate stations and district regulators. High-pressure gas is also supplied directly to major industrial consumers.

4.2.1 Brisbane region

This 2,000 km^2 gas distribution network is located on the southside of the Brisbane River starting from Dinmore and Springfield in the west to Cleveland in the east, and Marsden and Loganlea in the south to Wynnum in the north. The network comprises approximately 1,300 km of high, medium and low-pressure pipelines servicing 44,000 end users. The network is constructed of steel, polyethylene and cast iron mains.

Natural Gas is supplied from the AGL Roma Brisbane transmission pipeline at six custody transfer points (gate stations). The AGL DN300 steel, Class 600 pipeline

from Goodna to Gibson Island operates at a nominal operating pressure of 4,200 kPag across the city. The six gate stations are situated at Dinmore, Ellengrove, Runcorn, Wishart, Tingalpa and Doboy. Metering and odorisation of the gas are completed at these stations.

The older areas comprising cast iron and steel mains are supplied gas through subgate or district regulator stations located at Ekibin, West End, Wishart, Morningside, Salisbury, Sherwood and Wynnum. The district regulator stations serve as a pressure letdown facility from the high pressure into the medium and low-pressure systems. These stations are also used for humidifying and oil fogging of the gas flowing through areas where older pipelines are installed for preservation of the old cast iron and steel network integrity.

4.2.2 Western region

This 116 km^2 network, consists of 96 km^2 within the Toowoomba area, bordered by the escarpment in the east to Watson Court in the west, and Heritage Road in the north to Nelson Street in the south. The remaining 20 km^2 are located within the Jondaryan Shire Council boundaries at Oakey, extending from Kearneys Road in the west to Hamlyn Road in the east, and Oakey Aviation Base on Orrs Road in the north to Shannan Street in the south.

A 17.8 km spur main from the Oakey Gate Station extends southward to Purrawanda to supply a single load industrial end user.

Both Toowoomba and Oakey gate stations are supplied with transmission pressure (5,500–7,000 kPag) gas from the AGL Roma Brisbane pipeline. The gate station at Oakey is owned and operated by Allgas, whereas the Toowoomba gate station is owned and operated by AGL. Odorisation facilities and the final stage stand-by regulator at Toowoomba are owned by Allgas.

The Oakey network is relatively new system utilising steel and polyethylene mains. The Toowoomba network is a mixture of steel and polyethylene plus the old converted town gas low pressure network operating at a nominal pressure of 1.25 kPag. The low-pressure mains construction dates from 1880 to the present, and consists of cast iron, uPVC, steel, galvanised malleable steel, copper and polyethylene.

4.2.3 South Coast region

This network extends from the Albert River in the north to Benora Point (Tweed Heads) in New South Wales in the south. The network consists of a supply pipeline from the Albert River to Reedy Creek with distribution in the Yatala industrial areas and in the main residential/commercial areas from Runaway Bay to Coolangatta. The network consists of approximately 111 km of high-pressure steel mains and 138 km of high-pressure polyethylene mains.

The natural gas supply for the South Coast region is from Gowan Road gate station at Runcorn (Brisbane). A metering and pressure reduction facility is installed at Ashmore Road, Ernest.

4.3 SYSTEM DESIGN PARAMETERS

The Allgas network has been designed for the following maximum allowable operating pressures:

- Steel Class 600 7,200 kPag
  Class 300 4,200 kPag
  Class 150 1,200 kPag
- MDPE 500 kPag

For safety reasons, AEL has imposed a pressure limitation of 200 kPag on MDPE gas piping running through its metropolitan and suburban networks.

4.4 SYSTEM ASSESSMENT

The system design and capacity was reviewed by GHD in conjunction with Allgas Operations staff. The review essentially identified where excess piping and/or restrictions to demand existed. The following observations are appropriate:

Network model

Allgas does not utilise any advanced modelling software (such as Stoner SWS as used in New South Wales) to analyse its gas networks. Instead, Allgas has developed (and validated) in-house a spreadsheet based on pressure drop constraints for use in analysing the networks. GHD has utilised this spreadsheet in completing its optimisation analysis.

The spreadsheet-based model was not provided to Brown & Root for analysis, however its application along with sample output was explained during Allgas' network valuation presentation.

The results of the capacity review have identified areas where pipe diameters are currently oversized (and hence suitably reduced for the valuation) for demand over the next five years. The Toowoomba network has proven to be undersized (as stated in the Allgas Access Arrangement Information), and its analysis was completed based on a limiting gas demand to suit the current installations.

Small diameter piping

The decision to limit small diameters to no less than 40 mm is appropriate. This is because the respective costs are less sensitive to incremental material costs when compared to installation costs.

Non-optimum piping

GHD's review highlighted areas where redundant mains, duplicate mains, and/or pipe insertion techniques opportunities exist. Mains identified as either redundant or duplicate were reviewed with Allgas Operations to ensure their existence was not for alternative reasons such as security of supply or higher than average peak loadings—more common throughout the older cast iron piping systems in Southern Brisbane.

Redundant mains were removed from the total lengths of mains. Duplicate mains have been removed in cases where costs savings may exist. This includes and analysis of thrust boring under roads in place of mains being laid on each side, and possible requirements for a larger single main to replace two existing mains.

Insertion techniques have been identified as only being feasible for 47% of existing cast iron mains. Insertion into existing cast iron mains was analysed with respect to location and difficulty of access, and was limited to the low pressure system (200 kPag maximum operating pressure as defined by the Queensland Gas Regulations 1989) because of the reduced ground cover over the cast iron pipes.

Minimum pressure

All areas within Brisbane, Oakey and South Coast will meet minimum supply pressures over the forecast five-year period. However, the Toowoomba network, in its current state, is not able to meet forecast demand over this five-year period.

Network design philosophy

Allgas' network design philosophy for mains is based on projected gas demand within a particular area, which then determines the need for single or dual mains per street. Due to the warm climate in the various areas, central heating is not common, and domestic gas usage is limited to hot water and stoves. The commercial and industrial users are by far the largest customers, and extension of the gas network into a new area without a commercial and/or industrial user is unlikely.

Given the nature of gas usage in these areas, this approach throughout the network is reasonable.

Material selection

The varying materials of construction used throughout the Allgas network indicate the age of the different regions—the materials used were those preferred at time of laying. If the network were to be constructed in 2000, most of the pipe would be polyethylene. Along with material savings, this pipe can be installed by semi-skilled workers, its hydraulic properties are better than those of steel, and it is corrosion resistant, thus lowering the system operating costs.

Steel would continue to be used for high-pressure mains and transmission lines because of the pressures involved and the related safety and security of supply requirements.

4.5 RESULTS

The Allgas gas network is a combination of 'old style' technology with current modern designs. The older parts of the network are gradually being replaced with modern materials of construction as part of Allgas' ongoing renewal programme.

As shown by GHD's analysis, optimisation has been constrained to existing delivery points. When analysing the Brisbane network (which has a widely scattered customer base), optimisation of high-pressure mains had to ensure there was no compromise to the necessary safety and security of supply measures built into Allgas' network.

Optimisation of medium-pressure and low-pressure mains identified the following:

- redundant mains
- duplicate mains
- pipe insertion opportunities.

Redundant mains were removed from the validation of mains lengths. Duplicate mains were analysed against the use of a larger single main with thrust boring across the street. GHD's analysis has shown no opportunity for material cost savings from the optimisation of duplicate mains in Brisbane's current 'brown fields' condition.

GHD has identified limited opportunities for pipe insertion due to constraints on depth of cover (which limits operating pressure), and location (i.e. underneath a main road). This is discussed further in Section 5.4 and Appendix C.

GHD's analysis has verified the current network is reasonable for a long-established network that has a long future operating life. It should be noted that existing 'over-sized' pipes have been reduced in diameter for the purposes of the valuation exercise to meet the projected demands over the next five years.

4.6 OPTIMISED QUANTITIES

The total length of mains pipework for Allgas' gas network is as follows:

- Brisbane—1,249 km
- Oakey—35 km
- Toowoomba—317 km
- South Coast—183 km
- South Coast Pipeline—89 km
- Total—1,873 km

Brown & Root considers these lengths reasonable based on the analysis used to obtain the same, and the lack of detail on the older areas. The approach used by Allgas and GHD for analysis and verification is acceptable for the purposes of this valuation. Cross-checking of electronic records against the older 4-chain maps has produced a good level of confidence in the accuracy of the data.

5 Optimised depreciated replacement cost

5.1 GENERAL

The optimised replacement cost has been derived by using the optimised quantities and sizes of pipe determined in the previous section, multiplied by the construction unit rates and other costs shown below. As an Incumbent Owner, Allgas has taken advantage of insertion techniques in the form of trench and residual values when analysing and valuing its optimised network.

5.2 CONSTRUCTION UNIT RATES AND OTHER REPLACEMENT COSTS

GHD have proposed a set of unit rates to be used for construction and other items in the optimised replacement cost. The rates have been compiled to take into account relevant ground and soil types and construction difficulty factors for the various regions.

Brown & Root has reviewed these rates in line with its own estimates, and in comparison with rates used for similar reports in other cities around Australia, and believes these to be acceptable for this valuation.

The following comments on the unit rates are appropriate:

- *Steel pipelines:* The steel pipeline unit rates are based on AS 2885 and/or AS 1697 Division 2 pipelines as appropriate.
- *PE pipelines:* The PE pipeline rates are for direct burial only. Cost savings for insertion have been set as an average 25% saving and incorporated into the model for depreciation purposes and trench valuation purposes only (i.e. a 25% residual value has been applied to inserted pipelines).
- *Rock:* Unit rates have included rock for a proportion of Brisbane. Adopted rates have also allowed for reef, clay, and sand ground conditions throughout the different areas.
- *Overheads:* The unit rates have included reasonable Allgas and contractor overheads. These include design, procurement, contract management, supervision, etc. The exact percentage applied was not made available to Brown & Root because of confidentiality restrictions.
- *City/built-up areas:* Construction rates for built-up urban areas are higher mainly due to the restoration and coordination requirements (traffic, permits, etc). The rates have been presented against a set of base rates to show the comparisons. Base rates were developed for a low-density development area with predominantly clay soil conditions.

- *Domestic services:* An average set of lengths was developed to take into account connection from mains for the various types of consumers. A set of unit rates for each type of service for each area was developed which includes connection to the main, service extension to the meter, and an upstand to support the meter.
- *Commercial services:* As for domestic services, an average length for commercial services was derived, and used to compile a set for unit rates.
- *Industrial services:* Industrial services are as per domestic and commercial services. Allgas has determined three types of industrial consumer based on annual gas usage.
- *Meters:* Standard meter rates were developed for each type of consumer. The rates include supply and installation.
- *Regulator stations:* Regulator stations include gate stations, sub-gate stations, and district regulators.

5.3 DEPRECIATION

The remaining asset life for mains, services, and equipment was generated using existing Allgas records and Operations input. This study applies depreciation to remaining original material useful life as opposed to economic useful life as has been used in similar network studies.

GHD has presented a case that, based on current and future projected gas supplies and demands, economic useful life will not be less than material useful life. Brown & Root finds this acceptable based on the natural gas supply industry in Queensland.

Material useful lives have been established as listed in Table 5.2 below:

Table 5.2 Material useful lives of assets

Asset group	Technical life (years)
MAINS AND SERVICES	
Cast iron	80
Steel:	
• protected	105
• unprotected	45
PVC	30
PE	80
Copper	85
METERS	
M1 (domestic/commercial)	25
M2 to M5 (commercial/industrial)	30
Gate / Sub-gate stations	50
District regulators	50

Where a material has reached its technical life and is still in service, GHD has adopted a remaining useful life of five years. This value is a reasonable engineering judgement given that some of the cast iron mains have operating lives up to nine years

over their technical life. However, to maintain consistency with other gas network studies, a value of 5% of technical life has been adopted for Brown & Root's review in lieu of the GHD five years.

These lives were established by GHD in accordance with Allgas Operations input. A workshop was held with Allgas to determine suitable useful lives. These figures are also supported by a literature search conducted by GHD on material lives.

Analysis of these lives shows that the protected steel is low compared to a more industry 'standard' life of 120 years. The life of eighty years for polyethylene is greater than the more 'standard' 60 years adopted by other gas networks. The lower operating pressures used by Allgas justify this increase in useful life.

Brown & Root finds these values acceptable. As can be seen by the comparisons in Table 5.3 below, technical lives tend to vary according to the operator, the network area, and the operating conditions.

Table 5.3 Technical lives comparison

Material	Allgas	Envestra South Australia	AGL Sydney	Stratus Albury	Gascor Victoria
Cast iron	80	85	—	—	50–120
Steel—protected	105	130/125	80	120	120
Steel—unprotected	45	65	—	—	30–60
PVC	30	—	—	—	60
PE	80	70	50	60	60
Copper	85	—	—	—	—

5.4 VALUATION

Using optimised quantities, unit rates, straight-line depreciation and the technical lives shown above, GHD has calculated the depreciated optimised replacement cost (DORC) for the Allgas gas distribution network as $181,403,250. The breakdown is as listed in Table 5.4.

Table 5.4 Valuations

Cost type	GHD value ($)	B&R review ($)
Replacement cost	245,729,073	241,234,485
Depreciated replacement cost	185,058,509	182,802,863
Optimised replacement cost	241,480,717	236,996,527
Depreciated optimised replacement cost	181,403,250	179,155,696

Note: Includes $100,000 for stock equipment and materials

The work undertaken by GHD (asset determination, rates and price reviews, workshops with Allgas Operations etc.) would typically give rise to a ± 15% valuation. Given the limits on data availability to complete this valuation, Brown & Root would feel it reasonable for GHD's estimate to be accurate to ± 20%.

The main reasons for the cost variations as identified in Table 5.4 are rounding error in the GHD mains rates, application of residual (trench) values, and replacement of 5 years with 5% technical life for assets which have exceeded their technical life and are still in service.

In its DORC report, GHD has stated that approximately 47% of the existing cast iron and unprotected steel mains qualify for insertion given their location, accessibility, and depth of burial. Savings from insertion (25% of direct burial) are used to determine a trench value for these materials of 11.75% (47% of pipes with 25% saving).

This trench value has been incorporated as a residual value to pipes qualifying for insertion where the trench value exceeds the asset's remaining useful life depreciated value.

Four network line items in the Brisbane Region and two in the Toowoomba region have the trench value adopted in the valuation instead of the DORC value. This is for 51.9 km of cast iron mains which has exceeded its useful technical life by nine years.

Brown & Root does not necessarily agree with the method of allocating a trench and/or residual value. As the Incumbent Owner, Allgas would be expected to base its valuation on replacement costs of its existing network, including savings made from pipe insertion.

The inclusion of a trench/residual value, as defined in Allgas' report, has the effect of increasing the initial capital base which, in turn, increases the DORC. The issue of residual values application is one of an economic and legal nature (in line with competition policy) that will require a formal ruling by the local Regulatory Body.

5.5 VALUATION SENSITIVITIES

As the Incumbent Owner, Allgas has applied insertion techniques to some of its pipelines. Costs savings in construction due to insertion have not been passed on to the valuation—instead the percentage saving from insertion has been applied as a residual value which increases the base value, and hence the overall DORC.

This section examines the effects on the Allgas DORC after passing on construction savings into the valuation. The percentage reduction in construction costs— 25% as stated by Allgas in its network optimisation and valuation—has been used as a basis for these sensitivities.

One sensitivity cases is presented against the DORC valuation. This case is based on Allgas' analysis which allows for insertion on 47% of insertable pipelines (ie 11.75% is 47% of 25%). Table 5.5 details the results.

Table 5.5 DORC sensitivities

Sensitivity case	MEE DORC (Zero trench values used) ($)	MEE DORC (Allgas trench values used) ($)
Base case (report)	180,862,494	181,403,250
11.75% saving on pipeline insertion	179,155,696	179,427,800

The sensitivities show that by including all advantages ‘expected’ by an Incumbent Owner, the DORC valuation is reduced—even when applying residual values. In this instance the differences are not great because of the analysis undertaken by Allgas to determine specific areas where insertion is feasible.

6 References

Allgas Energy Ltd Report on Valuation of Gas Distribution Network Assets June 2000.

AGL Gas Networks NSW Gas Networks Depreciated Optimised Replacement Cost—Report by PPK and Kinhill Pty Ltd.

AGL Gas Networks Access Arrangement Information for NSW Network September 2000.

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SAIPAR Draft Decision Access Arrangement for the South Australian Distribution System April 2000.

Sinclair Knight Merz ODRC Asset Valuations Review February 1998—Report for the Office of the Regulator-General, Victoria, the ACCC and the Victorian Natural Gas Transmission and Distribution Businesses.

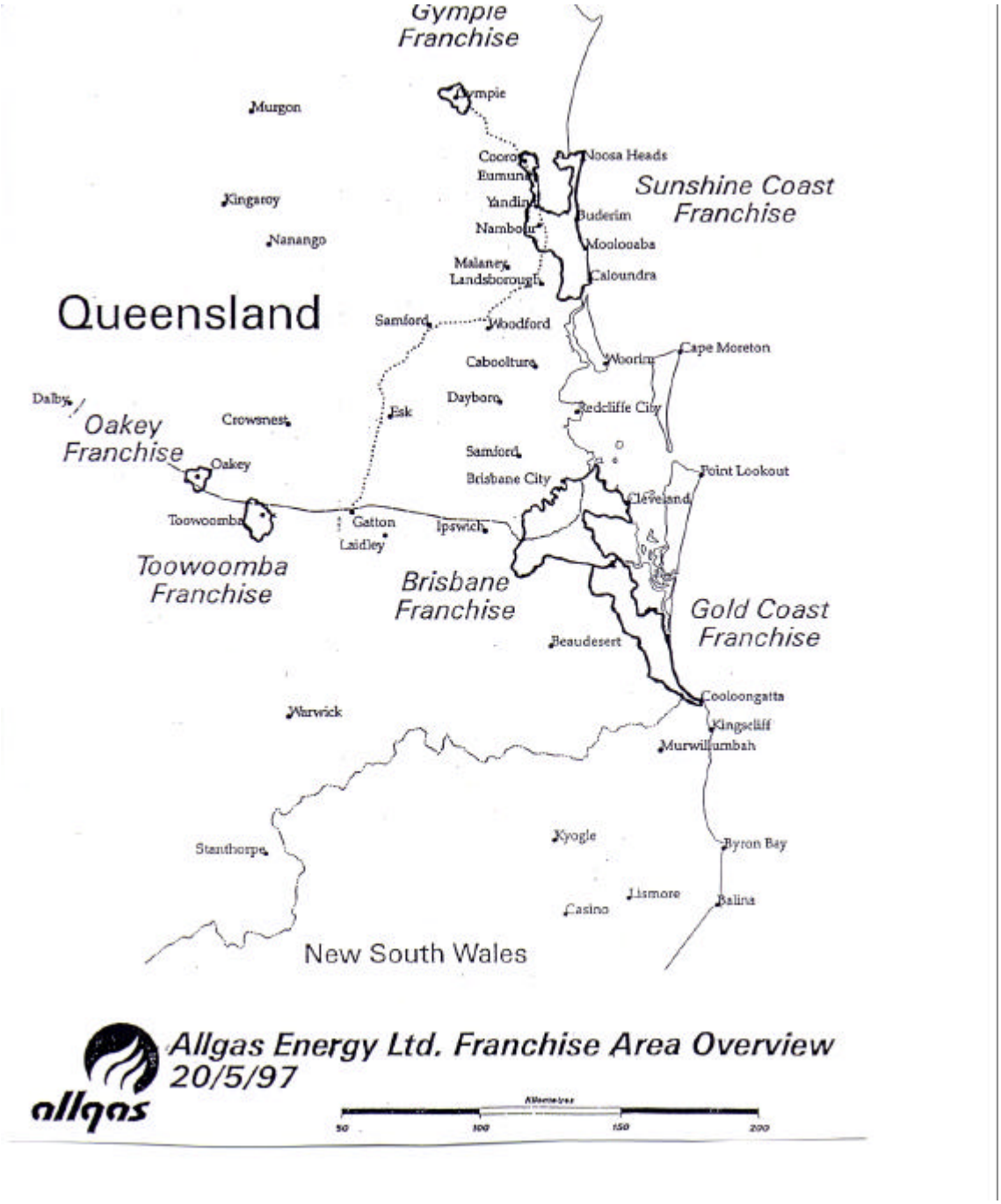
Kinhill Pty Ltd Review of the Optimised Replacement Cost of the Natural Gas Distribution Network in Albury February 1999—Report for IPART.

Appendix A

NETWORK LAYOUTS

Appendix A

Network layouts



Appendix B

DEPRECIATED OPTIMISED REPLACEMENT COST DETAILS

Table B1: Allgas Gas Network Valuation

VALUATION AS AT 30 JUNE 1999
Brisbane, Toowoomba, Oakey, South Coast

	EXISTING LENGTH / NUMBER OFF (Note 1)	REPLACEMENT COST BRS (Note 2)	REPLACEMENT COST GHD (Note 3)	OPTIMISED LENGTH / NUMBER OFF (Note 1)	ORC BRS (Note 2)	ORC GHD (Note 3)	DORC BRS (Note 2) (Note 4)	DORC GHD (Note 3)
MAINS, HP MAINS, SUB-TRANSMISSION P/L	1873	$165,231,785	$169,726,373	1873	$162,300,427	$166,784,617	$121,043,069	$123,290,623
SERVICES	60087	$51,502,980	$51,502,980	60087	$51,502,980	$51,502,980	$43,067,183	$43,067,183
METERS	60087	$16,445,820	$16,445,820	60087	$16,445,820	$16,445,820	$10,351,325	$10,351,325
REGULATORS / GATE STATIONS	285	$7,953,900	$7,953,900	247	$6,647,300	$6,647,300	$4,594,119	$4,594,119
INVENTORY STOCK		$100,000	$100,000		$100,000	$100,000	$100,000	$100,000
TOTAL		$241,234,485	$245,729,073		$236,996,527	$241,480,717	$179,155,696	$181,403,250

NOTES:
1. Refer Table B2
2. Refer Table B4
3. Refer GHD Report, June 2000, "Allgas Energy Ltd Report on Valuation of Gas Distribution Network Assets"
4. An insertion reduction factor of 11.75% for mains has been used where applicable in calculation of the above rates