Attachment 8.6

Unit Rates

2016/17 to 2020/21 Access Arrangement Information

Australian Gas Networks

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SOUTH AUSTRALIAN ACCESS ARRANGEMENT INFORMATION

ATTACHMENT 8.6

UNIT RATES FORECAST

2016/17 – 2020/21

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SA UNIT RATES FORECAST OVERVIEW

This report provides background material on the derivation of the unit rate forecasts that underpin the capital expenditure forecasts for the following categories of expenditure as presented in the Access Arrangement Information (AAI) and templates provided under the Regulatory Information Notice:

- Mains - new estate, existing homes and industrial and commercial (I&C);
- Inlets - new homes, multi-user, existing homes and I&C;
- Periodic meter change (PMC) – domestic and IC;
- Meter connection – domestic and IC; and
- Mains replacement - general block, general trunk replacement, CBD block, CBD trunk replacement, and High Density Polyethylene (HDPE) pipe replacement.

The unit rates forecasts consist of both:

- a contractor cost component; and
- a 'materials and other' cost component.

The approach that AGN has used to forecast these two cost components for the upcoming AA period (AAP) is summarised in the table below.

Nature of work and costs	Capex Category	Basis for Forecast Contractor Costs	Basis for Forecast Materials and Other Costs
Categories of expenditure that: • involve low volumes of work; • are subject to a high degree of variability and/or • it is difficult to derive meaningful assumptions on the mix of work to be carried out.	Existing home and I&C mains, existing home, multi-user and I&C inlets, PMC IC and demand, meter connection I&C, I&C inlets and general trunk replacement	Due to the difficulties in forecasting this type of expenditure, AGN has had recourse to the actual rates incurred in this AAP. Because the unit rates for this type of work can vary from year to year, AGN has based the forecast for the upcoming AAP on the three-year weighted[1] average unit rate measured over the period 2012/13 – 2014/15 (the most recent data for 2014/15 is YTD March 2015), unless circumstances indicate that this period will not generate an estimate that represents the best forecast possible in the circumstances (eg, PMC domestic).	The forecast rates for these cost categories have, unless otherwise indicated, been based on the three year weighted average historic unit rate. *Note that Materials and Other costs (including APA internal labour rates) are not covered by the recent contractor tenders, but are subject to standard APA competitive procurement policies to ensure the best commercial outcome.*
Categories of expenditure that involves high volume generic work	New estate mains, new estate inlets, domestic meter connections and general block replacement	AGN has had recourse to the results of recent tenders that have been carried out for Mains and Service laying contracts and Meter Installation contracts for the contractor component. Copies of the most recent contracts for this work have been included as Attachments to this document.	
Categories of expenditure that have no historic cost information (or historic costs are not indicative of costs that will be incurred going forward) and have not yet been subject to a competitive tender	CBD block, CBD trunk and HDPE replacements	Bottom up approach, with consideration given to costs from other comparable work.	

[1] For the purposes of calculating the weighted average, used the actual volume of work completed in 2012/13 and 2013/14 while for 2014/15 the volume of work completed in the nine months to March 2015 has been scaled up to an annual amount by multiplying it by 12/9.

In AGN's view, the approach outlined in the table above is consistent with rule 74 of the National Gas Rules, which states that a forecast or estimate must be arrived at on a reasonable basis and represent the best forecast or estimate possible in the circumstances.

Further detail on the mathematical derivation of unit rates contained in this report is provided in the spreadsheet set out in Attachment 4. All values in this report are expressed in $2014/15 values.

1. NEW ESTATE MAINS

Activity: Laying mains in new housing estates.

Nature of work and costs: Installation of gas supply and reticulation mains in new residential greenfield estate developments. The volume of activity is driven by house and land development market conditions with an average of approximately 40km of new estate mains installed each year. Because the work is quite generic, the unit rate is usually relatively stable.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in laying mains in new housing estates over the last four years and the forecast that has been assumed for the next AAP.

New Estate Mains $14/15	Historic Rates					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted. avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

As this figure highlights, the actual unit rates fell below the approved benchmark in 2012/13 and 2013/14 but have since increased. The trend observed in this period is somewhat unusual for new estate mains because the work is of a high volume generic nature and the unit rate is generally quite stable.

The lower rates observed in 2012/13 and 2013/14 were largely due to a reduction in the volume of large greenfield developments that were being brought to market during a downturn in the new home building industry. The decline in large scale new developments resulted in a reduction in large diameter trunk supply mains being constructed with the majority of new estate mains work limited to small diameter reticulation as existing developments were completed. This trend contributed to a decrease in both Contractor and Material/Other costs and led to a lower average unit rate for New Estate Mains because the Contractor and Material/Other costs for laying standard 63mm reticulation are lower than larger diameter (primarily 125mm and 160mm) supply mains laid within new estates.

Rates are starting to trend back towards benchmark in 2014/15 (March YTD rates) as major new greenfield developments commence in locations such as Buckland Park, One Tree Hill, Gawler East, Playford Alive and Seaford Heights. These projects include large diameter, higher cost, trunk supply mains which are driving an increased average unit rate for new estate mains.

Are current costs efficient?: The costs to-date reflect competitively tendered main laying unit rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient. As noted above, however, the costs have been lower than expected in this AAP because:

- smaller diameter mains have been laid; and

[redacted]

Current status of contracts: The contract for New Estate Mains was tendered in 2010/11 for an initial term of three years with 2 x 1 year options to extend. The first option was exercised in 2013/14 and expired 30 June 2014. A further 6 month contract extension was exercised in July 2014 during which time the New Mains and Services contracts have been retendered. Tenders for the New Mains and Services Laying contracts (new estates, existing homes and I&C customers) for a three year term were issued to market in August 2014. Tenders were received in November 2014 and the new contracts commenced in January 2015. Copies of the new Mains & Service laying Contracts are included at Attachment 1 to this document.

Forecast unit rates: In the next AAP, the unit rate for New Estate Mains is forecast to be [redacted] than the benchmark established in the last AA review [redacted]. The forecast in this case has been calculated as follows:

- The unit rate for contractor costs are based on the outcome of the recent competitive tender for new mains and services. The results of this tender indicate that historic costs are not a good indicator of future costs, with contractor rates having increased by approximately [redacted] under the recent tender. This increase can be attributed to:
  - higher civil construction costs associated with increased scope and increased width of common service trenches (i.e. contractors are now required to work in wider trenches, because common trench standards have changed in order to accommodate additional telecommunication services); and

[redacted]

Over the next AAP, contract labour costs are expected to [redacted] as further administrative and safety standards, and in particular a greater use of specialist traffic control, are implemented.

- The unit rate for materials and other costs are based on the three year historic weighted average unit rate, because the contractor tender does not cover the costs of materials or other costs (and in AGN's view they provide a reasonable basis for forecasting costs going forward).

The forecast also reflects the best estimate of the work that will be undertaken over the AAP.

2. EXISTING HOMES MAINS

Activity: Laying of mains in existing (brownfield) areas.

Nature of work and costs: Low volume (approximately 6-7 km p.a.) and subject to a high degree of inter-year variability because the scope of work can differ depending on the location (eg, within roadway or verge) and diameter of the mains.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in laying mains for existing homes over the last four years and the forecast that has been assumed for the next AAP.

Existing Home Mains $14/15	Historic Rates					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted. avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved in the last AA review.

As this figure highlights, the unit rates incurred in this period have exhibited a high degree of variability (ie, because the scope of work can differ in each year) and have been higher than the approved benchmark. Some other interesting points to note about existing home mains are outlined below:

- Labour costs are [redacted], but the contractor component of unit rate is also affected by the mix of work completed.
- Material costs are [redacted], but like contractor rates the material/other unit rate is also affected by the mix of work.

Are current costs efficient?: The costs to-date reflect competitively tendered main laying unit rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Current status of contracts: The contract for Existing Home Mains was tendered in 2010/11 for an initial term of three years with 2 x 1 year options to extend. The first option was exercised in 2013/14 and expired 30 June 2014. A further 6 month contract extension was exercised in July 2014 during which time the New Mains and Services contracts have been retendered. Tenders for the New Mains and Services Laying contracts for a three year term were issued to market in August 2014. Tenders were received in November 2014 and new contracts commenced in January 2015. Copies of the New Mains & Service Laying contracts are included at Attachment 1 to this document.

Forecast unit rates: In the next AAP, the unit rate for existing homes mains is forecast to be [redacted] than the benchmark adopted in the last AA review. The forecast in this case has been based on the three year weighted average unit rate for both contractor and material/other costs.

While AGN has received competitive tenders for Existing Home Mains contractor costs, the nature of this work is such (ie, low volumes and subject to significant variability) that it is difficult to derive meaningful assumptions on the mix of work that is likely to be carried out in the next AAP. The three year historic average has therefore been used in this case. This approach is consistent with the approach AGN has used for other expenditure categories that involve low volumes of work, are subject to a high degree of variability and/or where it is difficult to derive meaningful assumptions on the work mix.

Although the forecast has been based on historic rates, the following factors are expected to place upward pressure on unit rates over the next AAP:

- Contract labour costs are forecast to [redacted] as further administrative and safety standards, and in particular a greater use of specialist traffic control, are implemented and applied.
- Contractor and Material/Other costs are also forecast to rise as a number of local councils apply DPTI standard trenching specifications, which require full spoil removal and replacement for any trenching works in council roads. This replaces previous specifications allowing excavated spoil to be reused as backfill.
- Increasing traffic management requirements and DPTI reinstatement specifications including full lane width profiling are also contributing to Contractor cost increases, although the full impact is masked by rate volatility driven by the mix of work completed.

3. INDUSTRIAL & COMMERCIAL (I&C) MAINS

Activity: Laying of new mains to the boundaries of industrial and commercial premises consuming less than 10 TJ/yr. Note that no unit rates are used in respect of forecasting capex for Demand consumers (>10 TJ) because the frequency of connection of such consumers is low and the work is not of a generic nature.

Nature of work and costs: Low volume (approximately 3 km p.a.) and subject to a high degree of inter-year variability because the scope of work can vary from small diameter extensions in low density urban areas to high volume large distribution network extensions on DPTI roads or within the Adelaide CBD.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in laying mains for I&C customers over the last four years and the forecast that has been assumed for the next AAP.

I&C Mains $14/15	Historic Rates					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted. avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

As this figure highlights, the actual unit rates for I&C mains have been lower than the approved benchmark and have exhibited a significant degree of inter-year variability. In 2014/15, the unit rate is forecast to remain stable given the volume and mix of current I&C Mains orders awaiting construction, but this could change if new orders are received.

Are current costs efficient? Costs to-date reflect competitively tendered main laying unit rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Contract status: The contract for I&C Mains was tendered in 2010/11 for an initial term of three years with 2 x 1 year options to extend. The first option was exercised in 2013/14 and expired 30 June 2014. A further 6 month contract extension was exercised in July 2014 during which time the New Mains and Services contracts have been retendered. Tenders for the New Mains and Services Laying contracts for a three year term were issued to market in August 2014. Tenders were received in November 2014 and the new contracts commenced in January 2015. Copies of the new Mains & Service Laying contracts are included at Attachment 1 to this document.

Forecast unit rates: In the next AAP, the unit rate for I&C mains is forecast to be [redacted] than the benchmark adopted in the last AA review. The forecast in this case has been based on the three year weighted average unit rate for contractor and material/other costs.

While AGN has received competitive tenders for I&C Mains contractor costs, the nature of this work is such (ie, low volumes and specific nature of the work involved) that it is difficult to derive meaningful assumptions on the mix of work to develop a reasonable forecast for unit rates over the upcoming AAP. The three year historic average has therefore been used in this case. This approach is consistent with the approach AGN has used for other expenditure categories that involve low volumes of work, are subject to a high degree of variability and/or where it is difficult to derive meaningful assumptions on the work mix.

Although the forecast has been based on historic rates, the following factors are expected to place upward pressure on unit rates over the next AAP:

- Contract labour costs are expected to [redacted] as further administrative and safety standards, and in particular a greater use of specialist traffic control, are implemented and applied.
- Contractor and Material/Other costs are also forecast to rise as a number of local councils apply DPTI standard trenching specifications, which require full spoil removal and replacement for any trenching works in council roads. This replaces previous specifications allowing excavated spoil to be reused as backfill.
- Increasing traffic management requirements and DPTI reinstatement specifications including full lane width profiling are also contributing to contractor cost increases, although the full impact is masked by rate volatility driven by the mix of I&C mains work completed.

4. NEW HOME INLETS

Activity: Laying of inlets to new homes, either in greenfield or brownfield conditions.

Nature of work and costs: Approximately 5,000-6,000 new inlet service connections are laid each year to new residential dwellings under construction with the location of new home inlets varying from urban infill and regeneration projects requiring reinstatement and traffic management services to dwellings built in new greenfield estates where costs associated with reinstatement and traffic management may be lower. The unit rates for this type of work tend to be relatively stable.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in laying inlets to new homes over the last four years and the forecast that has been assumed for the next AAP.

New Home Inlets $14/15	Historic					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted. avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

[redacted]

As this figure shows, actual unit rates in the current AAP have been lower than the AER's benchmark but are expected to rise in the last year of the period. [redacted]

Some other interesting points to note about new home inlet unit rates are outlined below:

- In contrast to some other types of work, unit rates for new home inlets have historically been relatively stable with work largely of a generic nature and high volume (5,000-6000 connections pa).
- New home inlet unit rates are influenced by:
  - the mix of work completed between greenfield and brownfield developments, with higher traffic management and reinstatement costs in brownfield developments;
  - the volume of road crossings driven by the mix of same side versus opposite side connections; and
  - the location of inlet positions on a customer's property.

[redacted]

Are current costs efficient?: The costs to-date reflect competitively tendered inlet installation and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Contract status: The contract for New Home Inlets was tendered in 2010/11 for an initial term of three years with 2 x 1 year options to extend. The first option was exercised in 2013/14 and expired 30 June 2014. A further 6 month contract extension was exercised in July 2014 during which time the New Mains and Services contracts have been retendered. Tenders for the New Mains and Services Laying contracts for a three year term were issued to market in August 2014. Tenders were received in November 2014 and new contracts commenced January 2015. Copies of the New Mains & Service Laying contracts are included at Attachment 1 to this document.

Forecast unit rates: In the next AAP, the unit rate for New Home Inlets is forecast to be [redacted] as the benchmark established in the last AA review. The forecast in this case has been calculated as follows:

- The unit rate for contractor costs are based on the outcome of the recent competitive tender. The results of this tender indicate that historic costs are not a good indicator of future costs, with contractor rates having increased by approximately [redacted]. This increase can be attributed to both:
  - the implementation of further administrative and safety standards associated with new home building sites, traffic control and reinstatement; and
  - [redacted]
- The unit rate for materials and other costs are based on the three year historic weighted average unit rate, because the contractor tender does not cover the costs of materials or other costs.

The forecast also reflects the best estimate of the work that will be undertaken over the AAP.

Some other factors that are expected to place upward pressure on unit rates in the next AAP are outlined below:

- Contractor and material costs are expected to rise as a result of changes to the way in which the DPTI standard trenching specifications are applied, with some councils now requiring full spoil removal and replacement for any trenching works in council roads. This replaces previous specifications allowing excavated spoil to be reused as backfill and will result in higher contractor and material costs.
- The current trend towards a higher proportion of new homes being built in urban infill areas, which is forecast to continue during the next regulatory period driven by the South Australian Government Strategic Plan. Under this plan, the ratio of urban infill to Greenfield development is expected to increase from historical levels below 50:50 to the plan target of 70:30 as government strives to limit urban sprawl. This trend contributes to increased New Home Inlet unit rates given the higher contractor, traffic control and reinstatement costs associated with work completed in established areas compared to greenfield new estates.

5. MULTI-USER INLETS

Activity: Laying of inlets to premises that have a number of customers, such as units and apartments (usually in brownfield conditions).

Nature of work and costs: Low volume (approximately 100 p.a.) and subject to a high degree of inter-year variability because the scope of work can vary from small unit sites containing three or four dwellings to large multiple dwelling developments. As one would expect, the scale of a multi user site directly affects both contractor and material costs.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in laying multi-user inlets over the last four years and the forecast that has been assumed for the next AAP.

Multi User Inlets $14/15	Historic					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted. avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

[redacted]

As this figure shows, the unit rate for multi-user sites was higher than the AER benchmark in 2011/12 but then fell below this benchmark in 2012/13 and 2013/14. In 2014/15, the rate has started to trend back toward the benchmark as larger scale multi user developments come on line following improved new housing market conditions.

Some other interesting points to note about new multi-user inlet unit rates are outlined below:

- Unit rates for this type of work are expected to remain volatile due to the low volume of this work and varied scale of projects.
- Labour costs are [redacted], but the contractor component of unit rate is also affected by the mix of work completed.
- Material costs are [redacted], but like contractor rates the material/other unit rate is also affected by the mix of work.

Are current costs efficient?: The costs to-date reflect competitively tendered inlet laying rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Contract Status: The contract for multi user inlets was tendered in 2010/11 for an initial term of three years with 2 x 1 year options to extend. The first option was exercised in 2013/14 and expired 30 June 2014. A further 6 month contract extension was exercised in July 2014 during which time the New Mains and Services Laying contracts have been retendered. Tenders for the New Mains and Services contracts for a three year term were issued to market in August 2014. Tenders were received in November 2014 and new contracts commenced in January 2015. Copies of the New Mains & Service Laying contracts are included at Attachment 1 to this document.

Forecast unit rates: In the next AAP, the unit rate for Multi-User inlets is forecast to be [redacted] than the benchmark adopted in the last AA review. The forecast in this case has been based on the three year weighted average unit rate for contractor and material/other costs.

Historic rates have been used in this case because the volume and type of work that is expected to be carried out in the AAP is similar in nature to what has recently occurred. The historic rates therefore provide an appropriate starting point for estimating the costs that are expected to be incurred over the forecast period. Given the variability that these unit rates can exhibit form year to year, AGN has used a three year weighted average unit rate measured over the period 2012/13 – 2014/15. This approach is consistent with the approach AGN has used for other expenditure categories that involve low volumes of work, are subject to a high degree of variability and/or where it is difficult to derive meaningful assumptions on the work mix.

Although the forecast has been based on historic rates, the following factors are expected to place upward pressure on unit rates over the next AAP:

- Contract labour costs are expected to [redacted] as further administrative and safety standards, and particularly a greater use of specialist traffic control, are implemented and applied.
- Increasing traffic management requirements and DPTI reinstatement specifications also contributing to Contractor cost increases however the full impact is masked by rate volatility driven by the low volumes and mix of Multi User work completed.

6. EXISTING HOME INLETS

Activity: Laying of inlets to existing homes (brownfield conditions).

Nature of work and costs: Low volume (approximately 1,500-1,600 p.a.) and subject to some variation depending on the mix of same side and opposite side connections, the location of gas meters on customer properties (e.g. front boundary, garden, wall box) and the complexity of remaining properties available for connection.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in laying inlets in existing homes over the last four years and the forecast that has been assumed for the next AAP.

Existing Home Inlets $14/15	Historic Rate					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

As this figure shows, the actual unit rate has been lower than the AER's benchmark for much of the current AA period and is expected to remain that way going forward.

Some other interesting points to note about existing home inlet unit rates are outlined below:

- Labour costs are rising each year during current contract period [redacted], but the contractor component of unit rate is also impacted by mix of same side and opposite side connections completed and the location of inlet positions on a customer's property.
- Material costs are declining due to the trend towards front boundary meter locations on existing homes resulting in shorter length and less complex inlets. The trend away from wall box meters on existing homes has also delivered a reduction in costs associated with provision of wall boxes. This explains the slight downward trend in 2012/13 and 2013/14.
- Rate increases are [redacted] during the term of a contract, but once the contract expires the contractors can reset pricing to reflect actual cost escalations during the previous contract period
- Despite increased marketing programs promoting free gas connections, the volume of Existing Home Inlets completed in recent years remains relatively low as the penetration of gas connected properties increases and the pool of non connected established dwellings available for gas connection diminishes. The reduction in available properties results in more complex connections as dwellings on

large sites, sloping blocks, major roads and within the hills zone seek gas connections, which were previously considered too difficult or uneconomic for the homeowner.

Are current costs efficient?: The costs to-date reflect competitively tendered inlet laying unit rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Contract status: The contract for Existing Home Inlets was tendered in 2010/11 for an initial term of three years with 2 x 1 year options to extend. The first option was exercised in 2013/14 and expired on 30 June 2014. A further 6 month contract extension was exercised in July 2014 during which time the New Mains and Services contracts have been retendered. Tenders for the New Mains and Services Laying contracts for a three year term were issued to market in August 2014. Indicative tenders were received in November 2014 and new contracts commenced in January 2015. Copies of the New Mains & Service Laying contracts are included at Attachment 1 to this document.

Forecast unit rates: In the next AAP, the unit rate for Existing Homes inlets is forecast to be [redacted] than the benchmark adopted in the last AA review. The forecast in this case has been based on the three year weighted average unit rate for contractor and material/other costs.

Historic rates have been used in this case because the volume and type of work that is expected to be carried out in the AAP is similar in nature to what has recently occurred. The historic rates therefore provide an appropriate starting point for estimating the costs that are expected to be incurred over the forecast period. Given the variability that these unit rates can exhibit form year to year, AGN has used a three year weighted average unit rate measured over the period 2012/13 – 2014/15. This approach is consistent with the approach AGN has used for other expenditure categories that involve low volumes of work, are subject to a high degree of variability and/or where it is difficult to derive meaningful assumptions on the work mix.

Although the forecast has been based on historic rates, the following factors are expected to place upward pressure on unit rates over the next AAP:

- Contract labour costs are expected to [redacted] as further administrative and safety standards, and in particular a greater use of specialist traffic control, are implemented and applied.
- Contractor and Material Other costs are also forecast to rise as a number of local councils apply DPTI standard trenching specifications requiring full spoil removal and replacement for any trenching works in council roads. This replaces previous specifications allowing excavated spoil to be reused as backfill.
- The full impact of rising contractor rates will be masked to some extent by the variability in unit rates, which stem from the low volume and varied scope of work.

7. I&C INLETS (New Service Inlets < 10TJ)

Activity: Laying of inlets for I&C premises.

Nature of work and costs: Low volume (approximately 300 p.a.) and subject to a high degree of variation because the scope of work can vary from small diameter basic commercial connections to complex industrial connections and the location can also differ (ie, suburban streets, DPTI roads and Adelaide CBD).

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in laying inlets at I&C premises over the last four years and the forecast that has been assumed for the next AAP.

I&C Inlets $14/15	Historic					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted. avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

[redacted]

As this figure highlights, the actual unit rates were marginally above the approved benchmark in 2012/13 and 2013/14 and below the benchmark in 2012/13 and 2014/15. The volatility exhibited by the actual unit rates reflects the effect of the matters outlined in the nature of work section.

Some other interesting points to note about I&C inlet unit rates are outlined below:

- Unit rates are expected to remain volatile going forward due to the low volume of I&C Inlets and varied location and scope of work.
- Labour costs are [redacted], but the contractor component of the unit rate is driven by the mix of actual work completed.
- Material costs are [redacted] and like labour costs depend on the mix of work carried out.
- Increasing traffic management requirements and DPTI reinstatement specifications are contributing to higher contractor costs, although the impact is masked by the volatility exhibited by the unit rate.

Are current costs efficient?: The costs to-date reflect competitively tendered inlet laying unit rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Contract status: The contract for I&C Inlets was tendered in 2010/11 for an initial term of three years with 2 x 1 year options to extend. The first option was exercised in 2013/14 and expired 30 June 2014. A further 6 month contract extension was exercised in July 2014 during which time the New Mains and Services Laying contracts have been retendered. Tenders for the New Mains and Services contracts for a three year term were issued to market in August 2014. Tenders were received in November 2014 and new contracts commenced in January 2015. Copies of the New Mains & Service Laying contracts are included at Attachment 1 to this document.

Forecast unit rates: In the next AAP, the unit rate for I&C inlets is forecast to be [redacted] than the benchmark adopted in the last AA review. The forecast in this case has been based on the three year weighted average unit rate for contractor and material/other costs.

Historic rates have been used in this case because the volume and type of work that is expected to be carried out in the AAP is similar in nature to what has recently occurred. The historic rates therefore provide an appropriate starting point for estimating the costs that are expected to be incurred over the forecast period. Given the variability that these unit rates can exhibit form year to year, AGN has used a three year weighted average unit rate measured over the period 2012/13 – 2014/15. This approach is consistent with the approach AGN has used for other expenditure categories that involve low volumes of work, are subject to a high degree of variability and/or where it is difficult to derive meaningful assumptions on the work mix.

Although the forecast has been based on historic rates, the following factors are expected to place upward pressure on unit rates over the next AAP:

- Contract labour costs are expected to [redacted] as further administrative and safety standards, and in particular a greater use of specialist traffic control, are implemented and applied.
- Contractor and Material Other costs are also forecast to [redacted] as a number of local councils apply DPTI standard trenching specifications requiring full spoil removal and replacement for any trenching works in council roads. This replaces previous specifications allowing excavated spoil to be reused as backfill.
- The full impact of rising contractor rates will be masked to some extent by the variability in unit rates, which stem from the low volume and varied scope of work.

8. PMC DOMESTIC

Activity: Changing domestic gas meters, which includes the following activities:

- Procurement of any new meters required, including quality control;
- Planning and scheduling of meters to be changed over;
- Organising resources (combination of direct and contractor) to carry out the meter change. This includes testing of outlet service and relighting appliances, and if required, re-attending premises after hours if the consumer requires assistance;
- Testing meters brought in from the field;
- Refurbishing of meters as required; and
- Operating the meter shop (sited at Kidman Park).

Nature of work and costs: Approximately 30,000- 35,000 domestic meters are changed over each year due to end of life requirements, this is to ensure the meter is calibrated and fit for purpose in accurately measuring the gas to the consumer within +/– 2%. This activity involves the replacement of the customer's meter, some consumables and the labour to carry out this work.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in replacing domestic gas meters over the last four years and the forecast that has been assumed for the next AAP.

Domestic PMC $14/15	Historic					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	2 year weighted avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

As this figure shows, the actual unit rates were initially lower than the AER's benchmark but have since risen. Unit rates were lower in 2011-12 and 2012-13 because AGN was able to use more low cost refurbished meters than originally forecast. AGN's ability to use cheaper retested/refurbished meters is becoming more restricted because only the Email 602 and Parkinson Cowen U6 meters can be retested and put back into the field. These meter families are now approaching 40 years of age and will therefore need to be scrapped as they are returned from the field over coming years. There are approximately 30,000 meters that will be scrapped over the next 10 years.

Another factor that has influenced the unit rate in this period is that the Parkinson Cowen 30R meters in the field are unable to be refurbished and are coming to the end of their serviceable life. This meter type ceased being refurbished in 2012/13 and the major supplier of meter parts (Landis and Gyr) no longer supplies parts for these meters, meaning that refurbishment of the these meters is no longer an option. This has resulted in a change in the mix of refurbished to new meters in recent years, with an increasing proportion of more expensive new meters being installed over the past two years and continuing into the next AAP (see table below).

Domestic PMC	2011-12	2012-13	2013-14	Mar_14 YTD
New meters	[redacted]	[redacted]	[redacted]	[redacted]
Repaired meters	[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]	[redacted]
%new	[redacted]	[redacted]	[redacted]	[redacted]

Together these two factors have resulted in a step increase in the materials component of the unit rate in 2013/14.

Are current costs efficient?: The costs to-date reflect competitively tendered rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Contract status: The contract for the supply of new meters is usually tendered every three years. The current contract was due to expire on 31st October 2014, however, negotiations have allowed the favourable terms to be extended to late 2015. Tenders for the ''meter change and meter installation'' contract were received in December 2014. New three year contracts commenced in April 2015, with the tendered rates in line with current rates. Copies of the new Gas Fitting Contracts are included at Attachment 2 to this document.

Forecast unit rates: In the next AAP, the unit rate for changing domestic meters is forecast to be [redacted] than the benchmark adopted in the last AA review. The forecast in this case has been based on a two year weighted average historic unit rate for contractor and material/other costs, measured over the period 2013/14 and 2014/15 YTD. The two weighted average rate of [redacted] for contactor costs is in line with the new contract rates awarded.

A two year rate has been used in this case because, as explained above, AGN's ability to use cheaper retested/refurbished meters changed in 2012/13 and there has been a marked step change in the costs of changing domestic gas meters since that time. In other words, the unit rates measured prior to 2013/14 do not therefore provide a reasonable basis for determining the forecast unit rates for the upcoming AAP. AGN has therefore used a two year weighted average rate.

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9. PMC IC

Activity: Changing non-domestic gas meters, which includes the following activities:

- Procurement of any new meters required, including quality control;
- Fabrication of site-specific fittings and pipework;
- Planning and scheduling of meters to be changed over;
- Organising resources to carry out the meter change in conjunction with customer requirements/restrictions; and
- Testing meters brought in from the field.
- Refurbishing of meters as required

Nature of work and costs: Low volume (approximately 1,500 p.a.) and subject to a significant degree of volatility because the scope of work can differ depending on the number of larger models that need to be replaced.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in changing non-domestic gas meters over the last four years and the forecast that has been assumed for the next AAP.

I&C PMC $14/15	Historic					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

[redacted]

Unlike some other types of expenditure, it is difficult to compare unit rates over time because they can vary substantially from year to year depending on the number and size of the I&C meters that need to be changed (ie, in some years there may be a greater number of larger models that need to be replaced than what occurred in previous years, which will affect the replacement/refurbishment cost).

Some other important points to note about unit rates for PMC IC and demand are outlined below:

- Large I&C meter changes are predominantly carried out by internal staff.
- The major supplier of meter parts no longer refurbishes meters, so the price for parts has risen.

- The materials cost component of the unit rate has fallen somewhat because of an increased use of refurbished meters.

Are current costs efficient?: Large I&C meter changes are predominantly carried out by internal staff. While the work is not subject to a competitive tender, it can still be viewed as efficient given the incentives AGN's asset management service provider, APA, has to minimise costs under its outsourcing contract.

Forecast unit rates: In the next AAP, the unit rate for changing non-domestic gas meters is forecast to be [redacted] than the benchmark adopted in the last AA review. The forecast in this case has been based on the three year weighted average unit rate for contractor and material/other costs.

Historic rates have been used in this case because the volume and type of work that is expected to be carried out in the AAP is similar in nature to what has recently occurred. The historic rates therefore provide an appropriate starting point for estimating the costs that are expected to be incurred over the forecast period. Given the variability that these unit rates can exhibit form year to year, AGN has used a three year weighted average unit rate measured over the period 2012/13 – 2014/15. This approach is consistent with the approach AGN has used for other expenditure categories that involve low volumes of work, are subject to a high degree of variability and/or where it is difficult to derive meaningful assumptions on the work mix.

10. METER CONNECTION DOMESTIC

Activity: Installing domestic gas meters for new connections, which involves the following activities:

- Procurement of new meters, including quality control;
- Planning and scheduling of meter installations;
- Organising resources (combination of direct and contractor) to carry out the meter installation; and
- Installing the new meter and carrying out a safety check and appliance commissioning.

Nature of work and costs: Relatively high volume (approximately 7,000 – 8,000 units p.a.) and unit rates relatively stable.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in installing domestic gas meters for new connections over the last four years and the forecast that has been assumed for the next AAP.

Domestic Meters $14/15	Historic					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

As this figure shows, actual unit rates have been lower than the approved benchmarks and are expected to remain that way over the remainder of the current AAP. The lower rates reflect the effect of a subdued housing market, which has resulted in lower connection rates than were forecast at the last AA review.

In 2012/13 there was also a reduction in more expensive I&C meters used for domestic purposes from the previous year, but this trend is reversing.

Are current costs efficient?: The costs to-date reflect competitively tendered rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Contract status: The contract for new meters is tendered every three years. The current contract term was due to expire on 31st October 2014, but the term has been extended to October 2015. Tenders for the meter change/installation contract were received in December 2014 with three year contracts entered into in April 2015. The tenders have resulted in a lower rate for installing a new meter, which has been factored into the forecast. Copies of the new Gas Fitting Contracts are included at Attachment 2 to this document.

Forecast unit rates: In the next AAP, the unit rate for domestic meter connections is forecast to be [redacted] than the benchmark established in the last AA review. The forecast in this case has been calculated as follows:

- The unit rate for contractor costs are based on the outcome of the recent competitive tender. The results of this tender clearly indicate that historic costs are not a good indicator of future costs, with contractor rates having fallen by approximately [redacted] under the recent tender.
- The unit rate for materials and other costs are based on the three year historic weighted average unit rate, because the contractor tender does not cover the costs of materials or other costs.

The forecast also reflects the best estimate of the work that will be undertaken over the AAP.

11. METER CONNECTION IC

Activity: Installing gas meters for new I&C connections (<10TJ/yr), which involves the following activities:

- Procurement of new meters, including quality control;
- Planning and scheduling of meter installations;
- Organising resources (combination of direct and contractor) to carry out the meter installation; and
- Installing the new meter and carrying out any relevant safety checks.

Nature of work and costs: Low volume (approximately 250-300 units p.a.) and subject to a significant degree of volatility because the scope of work can differ from year to year depending on the number and size of I&C meters that need to be connected.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in laying connecting IC meters over the last four years and the forecast that has been assumed for the next AAP.

I&C Meters $14/15	Historic					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

[redacted]

As with I&C inlets, it is difficult to compare unit rates for I&C meters over time and to compare these unit rates with a benchmark because they can vary substantially from year to year depending on the number and size of I&C meters that need to be changed.

Are current costs efficient?: Large I&C meter connections are predominantly carried out by internal staff. While the work is not subject to a competitive tender, it can still be viewed as efficient given the incentives APA has to minimise costs under its outsourcing arrangement with AGN.

Forecast unit rates: In the next AAP, the unit rate for IC meter connections is forecast to be [redacted] than the benchmark adopted in the last AA review. The forecast in this case has been based on the three year weighted average unit rate for contractor and material/other costs.

Historic rates have been used in this case because the volume and type of work that is expected to be carried out in the AAP is similar in nature to what has recently occurred. The historic rates therefore provide an

appropriate starting point for estimating the costs that are expected to be incurred over the forecast period. Given the variability that these unit rates can exhibit form year to year, AGN has used a three year weighted average unit rate measured over the period 2012/13 – 2014/15. This approach is consistent with the approach AGN has used for other expenditure categories that involve low volumes of work, are subject to a high degree of variability and/or where it is difficult to derive meaningful assumptions on the work mix.

12. MAINS REPLACEMENT

Activity: Replacing mains and services, usually by inserting polyethylene pipe in the old carrier pipe, and sometimes by direct burial. This type of work can be broken down into the following activities, each of which has its own unit rate:

- General block replacement;
- General trunk replacement;
- CBD block replacement;
- CBD trunk replacement; and
- HDPE replacement

12.1. General Block Replacement

Nature of work and costs: Large detailed constructions, which involve replacing existing cast iron, unprotected steel mains and other associated pipework in the network, including individual customer services, service risers and associated meter set rebuilds.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in general block replacement over the last four years and the forecast that has been assumed for the next AAP.

Block Replacement* $14/15	Historic Rates					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted. avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

*Excludes piecemeal replacement

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

[redacted]

As this figure highlights, while unit rates for general block replacement have been lower than the approved benchmark for most of the current AAP they are trending upwards and are now slightly above the benchmark.

Some other interesting points to note about the general block replacement unit rate are outlined below:

- Several areas of work to be undertaken in 2014/15 have a higher number of multi-user sites, some of which have been found to have installations that do not meet current standards and require upgrading. Going forward, multi-user sites will continue to add cost to the works due to required upgrades to current standards.

- In order to meet program volumes, interstate contractors now form part of the contractor mix and now undertake a greater proportion of replacement work. This has resulted in upward pressure on unit rates.
- Material costs are increasing due to recent improvements in installation standards, resulting in additional fittings, i.e. meter bars for the physical support of garden located meters, thermal activated safety valves for domestic services, and the installation of "10 Light" connectors at meter outlet points.
- On occasions, electrical installations such as reverse cycle air conditioner units and other constructions over the years have been installed close to gas meter installations, creating safety issues that result in the need to upgrade or relocate portions of the gas asset.
- Contract labour costs are expected to [redacted] as further administrative and safety standards, and particularly a greater use of specialist traffic control, are implemented and applied. This is expected to flow through to tendered rates.
- An increased level of scrutiny by local councils and higher awareness of gas consumers, particularly in relation to concrete reinstatement quality and timeliness, will influence rates upwards. For example, one council has commenced audits of reinstatements and has extremely high conformance standards.

Are current costs efficient?: The costs to-date reflect competitively tendered main replacement unit rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Contract status: All areas identified for replacement are tendered to a panel of pre-qualified contractors annually. Awarding of contracts has usually been made several months prior to the start of the financial year to assist successful contractors in meeting the construction timeframes. Two cheaper local contractors have recently had issues with safety performance, compliance to procedures and scope of work, and general quality of workmanship. The use of these contractors will cease or is likely to cease in 2015. This will result in an increase in average unit rates.

It is also worth noting that the use of smaller (and cheaper) contractors will diminish over time as they have been unable to conform and adapt to increasingly higher standards of safety and environmental management, and increasing and more rigorous compliance requirements. These requirements are more likely to be met by larger contractors that have the ability to spread the overheads associated with these obligations.

Forecast unit rates: In the next AAP, the unit rate for general block replacements is forecast to be [redacted] than the benchmark established in the last AA review. The forecast in this case has been calculated as follows:

- The unit rate for contractor costs are based on the outcome of the recent competitive tender for the 2016/17 replacement program (including additional multi-user site upgrades). The results of this tender clearly indicate that historic costs are not a good indicator of future costs, with contractor rates having increased by approximately [redacted] under the recent tender. Copies of these tenders are included at Attachment 3.
- The unit rate for materials and other costs are based on the three year historic weighted average unit rate, adjusted for the use of additional fittings/procedures with the addition of project supervision costs.

The forecast also reflects the best estimate of the work that will be undertaken over the AAP.

Some other points that are worth noting about this forecast are set out below:

- Unlike some other networks (e.g. Victorian metropolitan area) that exhibit clear differences in replacement difficulty across outer and inner suburbs, most areas of Adelaide (apart from the CBD) undergoing replacement are generally of similar nature. It has not therefore been necessary to develop suburb by suburb pricing for the purposes of forecasting.
- While small portions of recent work has incorporated high cost CBD work (less than 3 km in 2013/14), the rate to undertake this work is forecast separately and does not form part of the general block unit rate forecast above.

The table below and associated notes sets out how the $198 forecast was estimated.

16/17 Tenders	Inputs	Tendered Amount	$/m
Tendered Contractor rates (1)			
Un-scoped Variations (2)			
Material (3)			
Allowances Not in Tenders:			
Annulus fill for large diameter pipe (4)			
Fire Safety Valves (5)			
Meter bars (6)			
'10 Light' fitting (7)			
Allowance for exemptions (8)			
Project Supervision Costs			
Total			

Notes:

(1) Contractor unit rate [redacted] is based on an evaluation of tenders attached, received from the approved contractor panel.

Tender Block 2016/17	Length (m)	Tender Cost	Proposed Award
Brooklyn Park			
Findon			
Flinders Park			
Henley Beach South			
Kidman Park			
Lockleys			
Osborn			
Seaton			
Thebarton			
Torrensville			
TOTAL			

(2) [redacted] un-scoped variation allows for necessary adjustments to design during progress of works such as supply issues, actual mains alignment and depth or location of existing third party assets and gas mains or services, unforeseeable situations, additional works outside of original scope.

(3) Materials cost of [redacted] allows for pipe, fittings, regulators, mains and service valves, service risers, required to carry out the work.

(4) Annulus fill for large diameter mains - When insertion of PE mains greater than 90mm diameter is undertaken, the normal method of filling the annulus by canister foam is not suitable. Contractors were advised that large diameter filler is APA-issue material supply, as per pipe and fittings. All foam filler for other diameters smaller than 90mm is contractor supply. The length of main greater than 90mm in the 204 km tender package is 6,375m. An allowance for filling two open ends at each service connection has been made. The number of services at 13,832 over the 204 km equates to 14.8 m of main per service, which equates to 431 service openings related to the large diameter mains. At a cost of [redacted], this equates to [redacted], or [redacted] in relation to the entire 204 km works.

(5) Fire safety valves will be incorporated into the mains renewal works (at each meter installation). The cost installing these thermal activated shut-off valves has not been incorporated into tenderers' pricing, as it is a new safety initiative (refer Business Case SA31).

(6) Meter bars have been assessed nationally as a preferred method of providing physical stability and protection for free standing meter installations. Meter bars will also enable a fixed point of reference for inlet and outlet connections, and remove a source of possible leakage associated with the current use of "O" connectors.

(7) The new use of a '10 Light' connector to the meter bar provides an improved connection. In the case of mains replacement this results in some alteration to the customer pipework to enable connection. In addition to the cost of the fitting, this has been estimated to require an average one hour work for a gas fitter. This is a new initiative with tenders issued prior to its introduction. This work will now be an additional activity to the scope of work. This activity is being introduced over the next twelve months.

(8) Contractors are permitted to claim for certain exemptions under their contract terms, e.g. rock excavation, extra depth in excess of 1.5m, dewatering of excavations, specialist services such as removal of hazardous materials, arborist, extra reinstatement over break out due to Council/resident requests, etc.

(9) APA cost of project management, supervision, safety audits, and other associated costs, equating to an average of 5% of the full project cost.

12.2. General Trunk Replacement

Nature of work and costs: Detailed construction works which involve the replacement of large diameter cast iron and unprotected steel feeder trunk mains transporting gas between areas of the network. Replacement generally involves inserting large diameter PE pipe into old pipework, often with an associated increase in pressure but can often also require open cut works. This work can be subject to inter-year variability depending on the location, diameter, material and replacement method of the trunk main.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in general trunk replacement over the last four years and the forecast that has been assumed for the next AAP.

Trunk Replacement $14/15	Historic Rate					Forecast for next AAP
	2011-12	2012-13	2013-14	Mar15_YTD	3 year weighted. avg	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

As this figure shows, the general trunk replacement unit rate has been higher than the approved benchmark. It is worth noting though that because the volume of trunk mains is not high, the unit rate is influenced by the nature of specific projects (ie, trunk unit costs can vary significantly depending on the specific location of the trunk main, so significant fluctuation of this unit rate is expected when the volume and number of jobs is relatively small).

Are current costs efficient?: The costs to-date reflect competitively tendered trunk replacement unit rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Contract status: All trunk mains are tendered to pre-qualified contractors as they arise.

Forecast unit rates: In the next AAP, the unit rate for general trunk replacement is forecast to be [redacted] than the benchmark adopted in the last AA review. The forecast in this case has been based on the three year weighted average unit rate for contractor and material/other costs.

Historic rates have been used in this case because the volume and type of work that is expected to be carried out in the AAP is similar in nature to what has recently occurred. The historic rates therefore provide an appropriate starting point for estimating the costs that are expected to be incurred over the forecast period. Given the variability that these unit rates can exhibit form year to year, AGN has used a three year weighted average unit rate measured over the period 2012/13 – 2014/15. This approach is consistent with the approach AGN has used for other expenditure categories that involve low volumes of work, are subject to a high degree of variability and/or where it is difficult to derive meaningful assumptions on the work mix.

Although the forecast has been based on historic rates, the following factors are expected to place upward pressure on unit rates over the next AAP:

- Contract labour costs are expected to [redacted] as contractors meet increasingly more procedural, administrative and safety standards over time.
- A trend of increased scrutiny by local councils and road authorities, particularly on reinstatements, and the extent of their required reinstatement, is likely to place upwards pressure on unit rates.

12.3. Trunk Abandoned.

Nature of work and costs: Where a replacement main is not deemed necessary due to existing or new HP infrastructure, the old trunk main may simply be abandoned.

Prioritisation for replacement/abandonment of trunk mains is undertaken having regard to:

1. Leak frequency/history;
2. Safety and operational risks associated with the condition of the main;
3. The timing of downstream network replacement program; and
4. Availability and capacity of HP network infrastructure to support the replacement.

As discussed in section 5.2.4 of the Mains Replacement Plan, a number of MP CI and UPS trunk mains will be either fully replaced, partially replaced or abandoned. Of the existing 64 km, it is forecast that 22 km will be abandoned and 42 km replaced. The timing of these works is, to a great extent, dependent on completion of the CI and UPS block replacement program, and finalising detailed designs which will be completed over the next 18 months. The unit rate for trunk main replacement and abandonment has been based on excavating and sealing pipe ends every 50 metres (to prevent road subsidence) when the trunk main is abandoned.

Forecast unit rates:

As the abandonment of mains is not a regular activity, the forecast for performing this type of work has been estimated on a bottom-up approach using the experience of staff involved in such works. The resultant estimates are as shown:

Unit Cost - Excavation cost	[redacted]
Unit Cost - Fill	[redacted]
Total	[redacted]
Total Number of jobs (every 50 m)	[redacted]
Unit rate (22 Km)	[redacted]

In AGN's view, the bottom up approach based on best estimates of engineering staff with experience in the relevant area, is consistent with Rule 74.

12.4. CBD Block

The replacement of CI mains within the CBD was originally (as per the 2010 MRP) proposed to be completed within the current regulatory period. However the development of a strategic plan and subsequent tendering of work has taken longer than expected due to the complexities involved.

Nature of work and costs: Similar to General Block Replacement but complicated by highly congested areas, working restrictions, reinstatement of completely sealed areas, business interruption issues and increased coordination with a large number of stakeholders.

Historic and forecast unit rates: The table below sets out the actual unit rates that have been incurred in CBD Block replacement over the last four years and the forecast that has been assumed for the next AAP.

CBD Block $14/15	Historic				Forecast	
	2011-12	2012-13	2013-14	Mar15_YTD	2016-2017	2017-2020
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]		

Comparison of historic rates with AER approved rates: The figure below compares the actual unit rates that have been incurred in the current AA period with the unit rates the AER approved at the last AA review.

As this figure shows, the CBD block replacement unit rate has been lower than the approved benchmark to date but is expected to rise above this benchmark in the remainder of the period. The increase can, in part, be attributed to the fact that the work carried out to date has been in less complex/congested areas in the southern part of the CBD (south of Flinders and Franklin Streets) but this will change going forward.

Are current costs efficient?: The costs to-date reflect competitively tendered main replacement unit rates and actual material costs procured by competitive material tendering and can therefore be viewed as efficient.

Contract status: All CBD mains work is tendered to pre-qualified contractors annually.

Forecast unit rates: In the next AAP, the unit rate for CBD block replacement is forecast to be [redacted] than the benchmark adopted in the last AA review.

The forecast in this case has been developed using a bottom up approach, because the nature of the work to be carried out in the next AAP is substantially different to what has occurred to date. The replacement works in the next AAP will involve working closer to and within the central highly congested areas of the CBD – north of Flinders and Franklin Streets - involving larger diameter existing mains, an increase in congestion of traffic and pedestrians, increased levels of reinstatement (fully paved footpaths), increased working restrictions, increased commercial/business considerations (interruptions, coordination/liaison), etc. As no tenders have been conducted for this zone, an estimate of the unit rate for this zone has been derived, on the following basis:

1. Using as a reference unit rate, actual contractor unit rates (see Attachment 5, CBD contract) for replacement zones with similar pipe sizing south of Franklin and Flinders Streets - [redacted]. This area is less congested than the zone north of Franklin and Flinders Streets. With the inclusion of unscoped variations, allowances not in tenders, project supervision and material costs the unit rate becomes [redacted].

2. Cost of materials to cover large diameter sealing of annulus in the north CBD cost accounts for $6/m additional cost.

3. Applying a premium to the contractor reference unit rate as follows:
   - [redacted] additional traffic management personnel; and
   - [redacted] additional contractor mainlaying crew costs, to account for night time work (equivalent to [redacted]).

   These factors are based on experienced supervisors' assessment of the magnitude of differences in cost in undertaking work in such areas of the CBD.

4. The zone north of Flinders and Franklin Streets will be reticulated at a pressure of 7 kPa, thereby minimising the number of meter sets inside buildings that will require relocation. Approximately 80% of all meters inside buildings within the CBD are located in this zone. However, based on field audits conducted in 2013, approximately 25% of meter sets will still need to be relocated as they have been found to be in non-compliant locations. Of these:
   - 17% have been assessed as relatively easy to relocate, at a unit cost of [redacted]*;
   - 19% have been assessed as moderately difficult to relocate, at a unit cost of [redacted]*; and
   - 64% have been assessed as very difficult to relocate, at a unit cost of [redacted]*.

   ** Relocation costs are associated with running a new outlet service from the new meter position to the old meter position.*

   The cost of relocation of meters equates to a cost of [redacted] of main replaced, based on approximately 800 gas meters within the zone north of Franklin and Flinders Streets.

5. The resultant unit rate is summarised as follows:

Reference rate	[redacted]
Contractor cost premium	[redacted]
Meter relocation	[redacted]
Total	[redacted]

In AGN's view, this bottom up approach is consistent with Rule 74 and appropriate to use in cases where the scope of the work to be carried out over the forecast period is materially different to what was carried out historically and where limited other information is available.

12.5. CBD Trunk

Nature of work and costs: The work involved in replacing CBD Trunk lines is similar to General Trunk lines, but complicated by highly congested areas, working restrictions, reinstatements of completely sealed areas, business interruption issues and increased coordination with a large number of stakeholders. The length of CBD trunk replacements is a small percentage of the overall mains in the CBD area with projections to have these trunk replacements carried out in the first three years of the next AA period. This work can be subject to inter-year variability depending on the location, diameter, material and replacement method of the trunk main.

Historic and forecast unit rates: The replacement of trunk pipelines within the CBD was originally (as per the 2010 MRP) due to commence in this AAP. However the development of a strategic plan and subsequent tendering of work has taken longer than expected due to the complexities involved. Work is not therefore expected to commence on this activity until the next AAP. The table below sets out the forecast unit rate for the next AAP.

CBD Trunk $14/15	Historic				Forecast next AAP (based on bottom up estimate)
	2011-12	2012-13	2013-14	Mar15_YTD	
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER $/unit	[redacted]	[redacted]	[redacted]	[redacted]	

[redacted]

Contract status: All CBD trunk work will be tendered to pre-qualified contractors as it arises.

Forecast rates: In the next AAP, the unit rate for CBD Trunk Replacement is forecast to be [redacted] than the benchmark adopted in the last AA review. Like the CBD Block Replacement, the forecast has been developed using a bottom up approach because it has not been possible to rely on either:

- historic rates because work on the replacement of CBD trunk lines has not yet commenced; or
- the results of a competitive tender, because no tenders have yet been conducted for this work.

The forecast unit rate has instead been established by using the forecast rate for trunk mains in non-CBD areas as a starting point [redacted] contractor costs and [redacted] materials/other costs) – see section 12.2) and then adding a 25% premium to account for the more complex and further restricted works within the CBD (ie, higher business/consumer density, with some businesses also operating at night time, higher night time traffic and pedestrian traffic, etc). Using this approach, the resultant contractor unit rate forecast is [redacted].

In AGN's view, this forecasting approach is consistent with Rule 74 and appropriate to use in cases where there is no historic information or the results of competitive tenders to rely on.

12.6. SA CBD Mains Abandoned.

Nature of work and costs: Where a replacement main is not deemed necessary due to existing or new HP infrastructure, the old trunk main may simply be abandoned.

Prioritisation for replacement/abandonment of trunk mains is undertaken having regard to:

5. Leak frequency/history;
6. Safety and operational risks associated with the condition of the main;
7. The timing of downstream network replacement program; and
8. Availability and capacity of HP network infrastructure to support the replacement.

It is expected that 2km of mains with no services could be abandoned in the CBD which will require to be sealed every 50 metres to prevent water ingress and subsidence.

Forecast unit rates:

As the abandonment of mains is not a regular activity, the forecast for performing this type of work has been estimated on a bottom-up approach using the experience of staff involved in such works. The resultant estimates are as shown:

Unit Cost - Excavation cost	[redacted]
Unit Cost - Fill	[redacted]
Unit Cost - Total	[redacted]
Total Number of jobs (2km, every 50 m)	[redacted]
Unit rate (2 Km)	[redacted]

In AGN's view, the bottom up approach based on best estimates of engineering staff with experience in the relevant area, is consistent with Rule 74.

12.7. SA CBD Mains Upgrade.

Nature of work and costs: As discussed in section 5.2.3 of the Mains Replacement Plan, the actual replacement, upgrade and abandon lengths are pending a final detailed design for the network north of Franklin and Flinders streets (design for the area south of this has been completed). However, based on an initial concept design for this area it is expected that 5 km of the existing steel trunk mains may be upgraded, rather than replaced. However on testing the existing mains for upgrade it is anticipated that some portion of the 5km will have to be replaced due to pressure test failure. This is assumed at 10% of the total 5km. The balance will be tested and pressure upgraded at an estimated cost rate of 25% of the full replacement rate. Upgrade works involves isolation of main from the network, decommissioning of the main, pressure test, recommissioning of the main and reconnection to the network.

Forecast unit rates:

Due to the special nature of this work, the forecast for performing this type of work has been estimated on a bottom-up approach using the experience of staff involved in such works. The resultant estimates are as shown:

Insertion Costs (0.5 km CBD Trunk rate @ [redacted]	[redacted]
Upgrade costs 4.5km at 25% of insertion rate @ [redacted]	[redacted]
Total Cost	[redacted]
Length of Mains to be Upgraded	[redacted]
Unit rate (2 Km)	[redacted]

In AGN's view, the bottom up approach based on best estimates of engineering staff with experience in the relevant area, is consistent with Rule 74.

12.8. Inlet Services Multi user Sites

Nature of work and costs: From about 2004 until 2012, LP inlet services (CI and UPS) to multi-user sites (unit developments) were only replaced (in conjunction with the mains replacement program) if they failed a safety (pressure) test. Those services passing a pressure test were fitted with a boundary regulator and were left operating at LP. This process was undertaken in order to maximise the efficiency of mains replacement by deferring the more complex and lower risk asset (multi user sites) replacement to a later date, whereby those sites could be replaced as a contract package on a stand-alone basis. This process also minimised disruption to surrounding consumers and the public, as multi-user sites are more complex and time consuming to upgrade.

The majority of multi-user services consist of UPS that are estimated to be over 45 years old. Experience has shown UPS of this vintage is at the end of its useful life with first response teams commonly finding the service riddled with corrosion, with reactive piecemeal replacement the only repair option.

These assets will be replaced in a planned manner to minimise supply disruption and align system integrity with that of the inserted and pressure upgraded mains that these assets are connected to.

Forecast unit rates:

Forecast unit rate sto replace Multi user Sites are based on the following assumptions (as set out in section 5.2.6 of the Mains Replacement Plan):

1. An average of 1.9 multi user services per kilometre of mains replacement. This is the weighted average of actual volumes included in the scope of work for the FY 2012/13/15/16 block replacement tenders as detailed in the table below. Volumes from the FY 13/14 tender were excluded as they were considered to be an outlier.

	FY 12/13	FY 13/14	FY 14/15	FY 15/16
Mains Replacement –km	201	204	201	213
Multi User Service Sites	386	955	382	427
Weighted Average (sites/km)	2.6			
Weighted Average (excluding FY13/14)	1.9			

2. The total number of multiuser sites based on 1.9 sites per kilometre of mains replacement (refer to point 1 above) and mains replacement volumes prior to 2012 as detailed in the table below. Since FY 11/12 multi-user inlet replacements has been included in the scope of work for mains replacement and have been excluded from the number of legacy sites.

	FY	FY	FY	FY	FY	FY	FY	FY	Total

	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	
Replacement – Km	56.5	63.1	71.5	96.8	57.1	86.3	104.2	147.9	683.4
Multi User Sites - No	110	123	139	188	111	168	203	287	1328

3. Weighted average unit rate based on FY 15/16 contractor tendered volumes and rates, and material estimates as summarised in the following table. The tender information is included at Attachment 6.

	Multi-User Site Unit Costs			
	Units (2-4)	Units (5-10)	Units (11-20)	Units (20+)
FY 15/16 Tendered Multi User Site Volumes	271	133	16	7
FY 15/16 Multi User Site Mix	63%	31%	4%	2%
FY 15/16 Contractor Price - $/site	[redacted]	[redacted]	[redacted]	[redacted]
Materials Unit Cost - $/site	[redacted]	[redacted]	[redacted]	[redacted]
Management and Supervision - $/site	[redacted]	[redacted]	[redacted]	[redacted]
Total Average Unit Rate - $/site	[redacted]	[redacted]	[redacted]	[redacted]
Total Weighted Average Unit Rate - $/site	[redacted]			

In AGN's view, the above forecasting approach is consistent with Rule 74 and appropriate to use in cases where there is limited other reliable information to rely on.

12.9. Mains Renewal Piece (CI &UPS)

Nature of work and costs: Some mains renewals are performed on a "reactive" piecemeal basis as a means of overcoming urgent leakage problems or localised cases of water ingress.

Subject to the condition of the existing mains, it is sometimes found that conventional repairs are either not possible or economically not feasible due to multiple leaks in a localised area. In these cases piecemeal mains renewal is undertaken with replacement in the order of 100 metres or less in length using direct burial, rather than insertion.

An average of 3.9 km of piecemeal replacement has been completed over the last 3 three years. No work been undertaken for the 9 months to March 2015.

Forecast unit rates:

Due to the highly variable nature of the work and low volumes involved, the forecast is based on the most recent revealed cost of [redacted]. Because of the lack of data on HDPE piece work undertaken, the same rate is assumed for the nominal 2km of activity assumed for this type of work also in the Mains Replacement Plan (refer section 5.3.2 of that Plan).

Contractor	[redacted]
Material/Other	[redacted]
Total	[redacted]

12.10. Inlet Services

Nature of work and costs: There are cases where inlet services need to be renewed on a stand-alone basis (unrelated to mains renewal works). The need for such inlet service renewals arise when leaks or damages occur on the inlet service and inspection reveals that the service is heavily corroded or in such poor condition that repairs are not viable.

A nominal 100 service replacements have been budgeted for in FY 2015/16. As the CI and UPS mains replacement program progresses, the number of stand-alone service replacements will diminish. A nominal reduction of 20 service replacements per year from the 2015/16 budget has been assumed.

Forecast unit rates:

Given the variability that these unit rates can exhibit form year to year, AGN believes that the use of a three year weighted average unit rate may be higher than that which is a reasonable estimate for forecasting purposes. A lower unit rate has been estimated, on the basis that a reasonable estimate is one that is around the average of the March YTD figure and the three year weighted average.

Service Replacement $14/15	2011-12	2012-13	2013-14	Mar15_YTD	3 yr W. ave	Forecast
Actual $/unit	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

12.11. High Density Polyethylene (HDPE)

Work on the replacement of HDPE Class 250 and 575 pipelines has only commenced relatively recently in this period so there is limited historic information on the costs of carrying out this work.

Contract status: All HDPE replacement work will be tendered to pre-qualified contractors as it arises.

Forecast rates: In the next AAP, the unit rate for replacing MP Class 250 HDPE is forecast to be [redacted] while the unit rate for replacing MP Class 575 HDPE is forecast to be [redacted]. The breakdown of these unit rate forecasts is provided in the tables below. It is noted that a number of HDPE areas have recently been subject to a tender and are in the process of being assessed. It is possible therefore that the rates in the tables below may be revised if a decision is made to award contracts prior to the submission date for the response to the AER's draft decision.

Forecast Unit Rates: MP Class 250 HDPE Block

	2016/17	2017/18	2018/19	2019/20	2020/21
Contractor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Material/Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Unit Rate - $/m ($14/15)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

The forecast unit rate for HDPE has been derived using the following bottom up approach:

1. A block replacement of 26km of HDPE is being undertaken in 2014/15 in the area of Goodwood/Unley. The actual unit cost of this work has been used as a basis. Cost for 2016/17 to 2018/19 has been derived based on the actual unit rate of [redacted] for this work in 2014/15. As this is the first block replacement of HDPE undertaken by the business (which replacement requires extraction of old pipe and re-insertion of new pipe), it is considered that learnings from this work may translate into a slightly lower unit rate going forward. The unit rate has consequently been [redacted].

2. An additional [redacted] has been applied to account for approximately 49 km of small mains (40mm diameter and smaller) that cannot be inserted, but which will require replacement by direct burial. The [redacted] premium for direct burial is based on the extra cost of open cut trenching proportioned across the full length proposed for replacement. The resultant unit rate is [redacted].

3. Unlike most of the HDPE mains that were installed by insertion in old cast iron mains, approximately 77 km of MP Class 250 HDPE was laid as direct burial in relatively new areas around West Lakes and North Haven. Fortunately, it appears possible to insert the majority of these HDPE mains with smaller PE pipe, thereby minimising the cost. However, this (insertion) will not be possible for the services, meaning that the latter will need to be replaced by direct burial. This is estimated to [redacted] to the unit rate, resulting in a unit rate of [redacted] based on:

   - An average weighted unit rate (direct) of [redacted] per inlet service replacement; and
   - An average of 56 services per km of main.

   It is forecast that MP Class 250 replacement in these suburbs will occur over 2019/20 and 2020/21.

4. The resultant unit rates are [redacted] for standard replacement and [redacted] for replacement that includes direct burial of services. These costs, when weighted across the full length of replacement, result in an average unit rate of [redacted].

The unit rate for Class 575 HDPE is the same as for Class 250 HDPE in 2016/17 to 2018/19 because there are no differences between these pipes apart from the type of PE resin classification.

Attachments

Attachment 1 – Mains & Services Laying Contracts

[redacted]

Attachment 2 – Gas Fitting Contracts

[redacted]

Attachment 3 – 2016/17 Mains Replacement Tenders/Contracts

[redacted]

Attachment 4 – Unit Rate Derivation Spreadsheet

Attachment 5 – CBD Block Tender

[redacted]

Attachment 6 – Multi-User Site Tender