Submission to the Independent Pricing and Regulatory Tribunal: Review of prices for Sydney Desalination Plant Pty Limited

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Executive summary

Sydney Desalination Plant Pty Limited (SDP) owns and operates the desalination plant on Sydney's Kurnell Peninsula. The plant is sized to produce 250 megalitres (ML) of drinking water a day and has been designed to be scaled up to a capacity of 500 ML a day, if required in the future. SDP is currently a wholly-owned subsidiary of Sydney Water, and is licenced to own and operate the desalination plant under the Water Industry Competition Act 2006. SDP sells water to Sydney Water under a non-exclusive Water Supply Agreement, which includes interim water prices that recover SDP's capital and operating costs.

Independent water prices for SDP

The Minister for Finance and Services has asked the Independent Pricing and Regulatory Tribunal (IPART) to determine the maximum price for water supplied by SDP. Independent regulation of SDP's prices has a number of objectives. This includes providing transparency in price-setting for the community; protecting consumers from monopoly pricing; regulating SDP on a similar basis to Sydney's other bulk water supplier, the Sydney Catchment Authority; and ensuring that SDP can not 'cherry pick' supply to other parties at prices lower than those charged to Sydney Water.

The determination will set a maximum price for bulk water from SDP, which would apply to all water supplied to Sydney Water and other retailers, and a maximum price for supply to retail customers under SDP's retail licence. The retail price will need to allow for appropriate transport and retail costs to be added to the bulk water price. To facilitate the emergence of other water retailers, or the supply of other retail customers by SDP, Sydney Water intends to give IPART an access undertaking for its water network under the Water Industry Competition Act.

The Minister for Finance and Services has established a number of Pricing Principles for IPART to consider in making its determination. These include that IPART's determination should be based on SDP's efficiently incurred costs. The majority of SDP's costs are incurred under contracts that were subject to a rigorous and strongly contested competitive tender process. This includes costs incurred under contracts for the design, construction, operation and maintenance of the plant, and for the supply of electricity and renewable energy certificates to offset the plant's power use. SDP's non-tendered costs are generally non-controllable costs set by third parties, such as land tax, insurance and council rates. In 2008, Halcrow reviewed the efficiency of SDP's expenditure as part of a review of Sydney Water's expenditure. Halcrow's findings reinforced that SDP's costs are efficient.

Sydney Water currently owns the bulk water pipeline from the desalination plant to Sydney Water's existing distribution network at Erskineville. This pipeline has been sized to be able to deliver 500 ML of water per day. Given that the bulk water pipeline is integral to the supply of water from the desalination plant, Sydney Water is considering transferring the pipeline to SDP. The transfer, if approved by the Boards of SDP and Sydney Water, will occur before 1 July 2012. In view of this, this submission provides information on the costs of the bulk water pipeline, so that IPART can allow for the recovery of these costs in its price determination for SDP.

SDP's costs

SDP's annual cost, if SDP owns both the plant and the bulk water pipeline, is $264 million in 2012-13 (real $ 2010-11), falling to $261 million in 2016-17. This is based on the IPART's normal regulatory model (the Building Blocks approach). The costs include around $80 million per year in operating costs, and a return on and of a regulated asset base of $1,927 million. SDP's regulatory Weighted Average Cost of Capital is 7.8 per cent real pre-tax, which reflects the level of risk to which SDP is exposed in owning a single asset that (at this stage) has a single customer and a limited ability to diversify its cost and revenue risks.

The NSW Government's Metropolitan Water Plan includes Operating Rules for the desalination plant. The Rules state that the desalination plant must operate to maximise the production of drinking water when dam levels fall below 70 per cent of storages. The plant must continue operating until the dam storage level reaches 80 per cent. These rules are a condition of SDP's Network Operator Licence, which was issued under the Water Industry Competition Act.

In line with the Operating Rules, the desalination plant has the flexibility to shut down or operate at less than full capacity. This allows the plant to be switched off when dam storages are high to minimise costs to customers.

SDP's costs change when the desalination plant does not operate. In particular, some costs of operating the plant are avoided; once-off costs are incurred to shut-down or restart the plant; and surplus electricity and renewable energy certificates may be sold, creating a loss or gain, depending on the market price at the time of sale.

Structure of prices

To ensure that SDP's charges reflect its costs, when the plant operates SDP should charge a variable charge to recover its variable operating costs and an availability charge to recover its fixed operating costs and its capital costs.

When the plant is shut down costs are reduced but it is difficult to predict in advance when a shut-down might be required or for how long, so it is not possible to quantify accurately those savings in advance. However, it is important the community benefits from lower costs during a shut-down and that SDP receives a revenue stream that is appropriate to its costs.

SDP proposes that when the plant is shut down, a lower availability charge should apply, which would allow the recovery of capital costs as well as the reduced fixed operating costs that are expected to be achievable when the plant is shut down. In addition, SDP proposes a series of adjustments that would apply only in the event that a shut-down is required under the Network Operator Licence. These adjustments would allow additional savings that may be achievable in shut-down to be passed-through to customers, while also affording SDP some limited protection from unpredictable costs that are associated with shut-downs and restarts at the plant.

Period of determination

It is proposed that the price determination for SDP will apply from 2012-13 to 2016-17. The determination should commence on 1 July 2012 to align with the start of the new financial year. The determination should conclude on 30 Jun 2017 in accordance with the Pricing Principles set by the Minister for Finance and Services for this determination.

1 Overview of Sydney Desalination Plant Pty Limited

Key points

- Sydney's desalination plant is owned by Sydney Desalination Plant Pty Limited (SDP), which is a wholly-owned subsidiary of Sydney Water Corporation.
- SDP's operating framework comprises: an operating and maintenance agreement with Veolia Water Australia Pty Ltd; an Interface Deed with Veolia Water and John Holland Group, which constructed the plant; contracts with subsidiaries of Infigen Energy Ltd for the supply of electricity and renewable energy certificates to offset the power used by the plant; two licences under the Water Industry Competition Act; and a non-exclusive Water Supply Agreement with Sydney Water Corporation.

The desalination plant on Sydney's Kurnell Peninsula is owned by Sydney Desalination Plant Pty Limited (SDP). SDP is a wholly-owned subsidiary of Sydney Water. The plant is sized to produce 250 megalitres (ML) of drinking water a day and has been designed to be scaled up to a capacity of 500 ML a day, if required in the future.

Figure 1.1 Sydney's desalination plant on the Kurnell Peninsula

In addition to the plant itself, SDP's physical assets include:

- the seawater intake and concentrated seawater outlet tunnels and risers, sized for the ultimate capacity of 500 ML a day;
- a drinking water pumping station with an initial pumping capacity of 250 ML a day, and sufficient space to be scaled up to an ultimate capacity of 500 ML a day; and
- the land (45 hectares) on which the desalination plant and pumping station are located.

The bulk water pipeline that transports treated water from the desalination plant to Sydney Water's distribution network at Erskineville is, at present, intended to be transferred from Sydney Water to SDP before 1 July 2012. This pipeline is sized for 500 ML a day.

The Government may choose to expand the plant to its full 500 ML a day capacity, if required in the future. The Metropolitan Water Plan provides that the Government could make this decision if Sydney's total dam storage level drops again under severe drought conditions. Exact timing of the decision would be influenced by predicted weather patterns, and seasonal and projected demand levels. The plant would take about two years to expand.

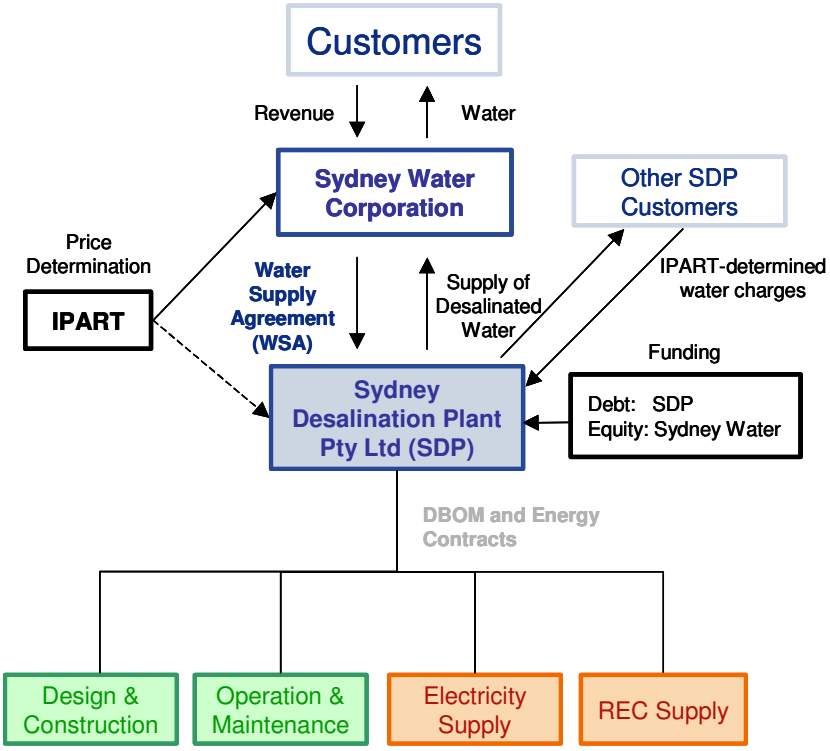
SDP's operating framework comprises a set of licences and agreements, which include:

- an operating and maintenance agreement with Veolia Water Australia Pty Ltd;
- an Interface Deed with Veolia Water and John Holland Group, which constructed the plant;
- contracts for the supply of electricity to power the plant and renewable energy certificates to offset the plant's power use;
- two licences under the Water Industry Competition Act; and

- a non-exclusive Water Supply Agreement with Sydney Water Corporation.

Key components of this operating framework are illustrated in Figure 1.2 and are described in further detail below.

Figure 1.2 SDP Operating Framework



1.1 Operating and Maintenance Agreement

The desalination plant is operated and maintained for SDP by Veolia Water Australia Pty Ltd. The Operating and Maintenance (O&M) contract between SDP and Veolia is dated 18 July 2007 and has a 20-year operating term. The O&M contract provides that:

- Veolia will operate and maintain the plant in accordance with industry best practice and a detailed Operations Management Plan;
- the plant will provide drinking water in quantities directed by SDP;
- the services performed by Veolia will meet technical requirements specified by SDP, including drinking water standards.

Payments under the contract cover the majority of direct operating costs of the plant, excluding energy supply.

1.2 Interface Deed

An Interface Deed has been entered into by SDP, the desalination plant Operator (Veolia Water Australia), the Contractors under the design and construct (D&C) contract for the plant (Veolia Water Australia and John Holland Group), and Veolia and John Holland's parent companies as guarantors. The Deed, which is dated 18 July 2007, specified a high level of coordination, cooperation and collaboration between the Contractors and the Operator.

In particular, the Deed stipulates that:

- the Contractors and the Operator must develop an Interface Management Plan, including arrangements for the Operator to certify both the compliance of the Contractors' designs and completed works with the requirements of the D&C contract, and the practical and final completion of the Contractors' works;

- any agreement or warranty made by a Contractor or the Operator in the D&C contract, the O&M contract or the other major project contracts binds all of them jointly and each of them individually; and
- SDP will not be liable to the Contractors, the Operator or their parent company guarantors for the consequences of any failure to perform or negligent performance by a Contractor or the Operator, except to the extent that the failure to perform or negligent performance is directly caused by the SDP.

1.3 Renewable Energy Contracts

Electricity for the desalination plant is provided under a contract between SDP and Infigen Energy Markets Pty Ltd, which is a subsidiary of Infigen Energy Limited. The conditions of the Energy Supply Agreement include:

- a 20-year term;
- fixed real prices;
- no pass through of any future tax, levy, impost or charge relating to greenhouse gas or carbon emissions;
- no pass through of any cost arising from the introduction or operation of any emissions trading scheme;
- a contracted annual volume sufficient to support full operations at the Plant; and
- ability to sell load back to the market if electricity demand is lower than forecast.

SDP also has agreements with Renewable Power Ventures Pty Ltd (RPV), another subsidiary of Infigen Energy Limited, for the supply of Renewable Energy Certificates (RECs) to offset the power used by the desalination plant. The RECs are supplied by the Capital Wind Farm at Bungendore near Canberra, which was built, and is operated and maintained, by RPV under a 20-year Project Deed with SDP.

The RECs are sold to SDP under a 20-year Renewable Energy Certificate Agreement, which provides for the supply of RECs at fixed real prices. The agreement includes a minimum annual number of RECs that SDP must purchase. Any surplus RECs may be sold in the market.

1.4 Licences

SDP holds a Network Operator licence and a Retail Supplier licence under the Water Industry Competition Act 2006 (WICA). The Network Operator licence permits SDP to construct, maintain and operate the desalination plant. The licence covers the plant site in Kurnell, the offshore discharge and inlet structures in the Tasman Sea, and the associated inlet and outlet tunnels.

The Network Operator Licence provides that Veolia Water Australia is an 'authorised person' on the licence. This enables Veolia to operate and maintain the infrastructure along with SDP.

The Network Operator Licence includes a condition that reflects the Operating Rules for the desalination plant. These rules were established by the Metropolitan Water Plan 2010 and state:

> *When the Available Storage falls below 70%, the Licence Holder must, until the Available Storage rises to 80%, operate and maintain the water industry infrastructure with the objective of maximising the production of drinking water.*

The Operating Rules were established by cost-benefit analysis to achieve optimal security of supply. They are designed to reduce the likelihood of water restrictions, provide water for environmental flows and provide increased water security. Further information on the operating regime is in Appendix 6.

SDP's Retail Supplier licence permits SDP to sell the water it produces to anyone other than a 'small retail customer'. In essence, SDP is licensed to sell drinking water to Sydney Water and

large businesses or another water retailer. The Retail Supplier licence is specific to water supplied by the infrastructure licenced under SDP's Network Operator Licence, and permits SDP to sell water within Sydney Water's Area of Operations (ie. Sydney, the Illawarra and the Blue Mountains).

SDP's Network Operator and Retail Supplier licences were issued by the Minister administering WICA on the recommendation of the Independent Pricing and Regulatory Tribunal (IPART). The licences are effective until they are revoked or replacement licences are issued.

Figure 1.3 Pumps in the desalination plant's drinking water pumping station

1.5 Water Supply Agreement

Sydney Water buys water from SDP under a 30-year Water Supply Agreement. The Water Supply Agreement sets out arrangements for the quantity, quality and price of water to be supplied to Sydney Water by SDP.

Under the Water Supply Agreement, Sydney Water will take delivery of all water produced by the plant that is not sold to other parties provided the water meets agreed quality specifications and complies with the Australian Drinking Water Guidelines set by the National Health and Medical Research Council. SDP is also required to meet the Australian Drinking Water Guidelines under its WICA licences.

The Water Supply Agreement provides that Sydney Water will pay the contract price for all water that is sold to it while the plant is operating in accordance with the Metropolitan Water Plan operating rules, which are reflected in SDP's Network Operator Licence.

The price of water supplied under the Water Supply Agreement is the price determined by IPART or, in the absence of such a price determination, $0.62 per kilolitre plus an availability charge of $12.7 million per month while the plant is available to produce water (the "Interim Charges"). The current availability and usage charges broadly cover all of SDP's costs. However, the Interim Charges do not reflect the risks and costs to SDP associated with potential shut-downs under the Network Operator Licence because it was always intended that the plant would operate at capacity during the initial two-year proving period. In addition, the current charges do not recover the costs of the bulk water pipeline between the plant and Sydney Water's distribution network because the

pipeline is currently owned by Sydney Water. At present, these costs are instead recovered directly through Sydney Water's prices.

Box 1.1 outlines the Interim Charges and the costs that each charge has been set to recover. This information is also available on Sydney Water's web site.

Box 1.1 SDP's interim charges to Sydney Water

SDP's current charges

Sydney Water pays the following interim charges to Sydney Desalination Plant Pty Ltd (SDP) for water produced by the desalination plant:

- A usage charge of $0.62 per kilolitre (1000 litres) of water purchased; and
- A fixed 'water security' or availability charge of $12.7 million per month.

Usage charge

The usage charge has been calculated to recover all of SDP's variable costs. These are costs that vary depending on the volume of water produced by the desalination plant. Each $0.62/kL usage charge that Sydney Water pays to SDP includes:

- About $0.16 to cover the plant operator's variable costs;
- About $0.46 to cover variable costs of electricity for the plant and for renewable energy certificates to offset the plant's energy use.

Availability charge

SDP also incurs costs whether or not the plant produces water. This represents the cost of having the plant available to supply water when required to do so. Out of each $12.7 million per month that Sydney Water pays to SDP in fixed water security or availability charges:

- About $1.1 million covers the plant operator's fixed costs;
- About $0.1 million covers fixed electricity costs;
- About $0.5 million covers other fixed SDP costs, such as insurance and council rates;
- About $8.1 million covers debt repayments, tax and a return on investment; and
- About $3.0 million is for depreciation.

1.6 Service Level Agreement

SDP has no direct employees as most of its functions are performed by Veolia Water under contract. SDP's 'back office' services (eg. governance and contract management services) are currently provided by Sydney Water under a short-term Service Level Agreement. Under the Service Level Agreement, SDP reimburses Sydney Water for the cost of these services. For instance, Sydney Water staff prepare SDP's accounts and Board reports. SDP reimburses Sydney Water for the costs incurred in doing so. The Service Level Agreement cost is effectively the cost of 'back office' services. The cost of the Service Level Agreement is around one per cent of the total operating cost of SDP.

1.7 Financial overview

SDP's projected profitability and financial outcomes are set out in the summary Profit and Loss Statement and Balance Sheet provided below. Detailed financial statements are contained in Appendix 5.

Sydney Desalination Plant Pty Limited Profit & Loss ($M Nominal)

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total Revenue	**199.7**	**270.4**	**277.6**	**287.2**	**296.1**	**300.2**	**302.7**
Operations & Maintenance Costs	28.1	31.3	32.8	37	40.4	41	40.1
Electricity Costs	21.3	24.2	26.2	28.2	30.4	31.6	32.5
Renewable Energy Costs	14.2	18.3	19.8	21.3	22.7	23.2	23.8
Other Operating Costs	2.8	3.2	3.3	3.4	3.4	3.7	4
Total Operating Expenditure	**66.4**	**77**	**82.1**	**89.9**	**96.9**	**99.5**	**100.4**
Depreciation & Asset Adjustments	30.6	37.9	38.1	38.8	40.2	42.1	43.6
Borrowing Costs	90.6	140.6	139.6	134.4	126.4	118.1	112.1
PROFIT BEFORE TAX	**12.1**	**14.9**	**17.8**	**24.1**	**32.6**	**40.5**	**46.6**
Income Tax	3.6	4.5	5.4	7.3	9.8	12.1	14
PROFIT AFTER TAX	**8.5**	**10.4**	**12.4**	**16.8**	**22.8**	**28.4**	**32.6**

Sydney Desalination Plant Pty Limited Balance Sheet ($M Nominal)

As at June 30	2011	2012	2013	2014	2015	2016	2017
Current Assets	25.6	31.2	31.9	32.9	33.9	34.3	34.7
Non-Current Assets*	1,282.3	2,000.3	2,012.4	2,022.6	2,030.3	2,037.4	2,045.9
TOTAL ASSETS	**1,307.9**	**2,031.5**	**2,044.3**	**2,055.5**	**2,064.2**	**2,071.7**	**2,080.6**
Current Liabilities	58.8	77.4	74.9	70.3	66.7	62.7	61.4
Non-Current Liabilities	1,127.4	1,783.6	1,746.8	1,704.0	1,649.4	1,585.9	1,514.7
TOTAL LIABILITIES	**1,186.2**	**1,861.0**	**1,821.7**	**1,774.3**	**1,716.1**	**1,648.6**	**1,576.1**
NET ASSETS	**121.7**	**170.5**	**222.6**	**281.2**	**348.1**	**423.1**	**504.5**

*The non-current assets in the Balance Sheet increase at 30 June 2012 because the bulk water pipeline and easements ($708 million nominal) are transferred into SDP during 2011-12 along with a corresponding increase in debt.

2 Determination of Prices for Sydney Desalination Plant Pty Limited

Key points

- This price determination will set prices to recover the efficiently incurred costs of Sydney Desalination Plant Pty Limited (SDP) in the period from 2012-13 to 2016-17.
- Independent regulation of the maximum price of drinking water supplied by SDP will provide transparency in price-setting; protect consumers from monopoly pricing; and regulate SDP on a similar basis to the Sydney Catchment Authority.
- The Minister for Finance and Services has requested that IPART consider certain Pricing Principles for the determination of SDP's prices to ensure that the prices reflect the services provided. SDP's services are the supply of non-rainfall dependent drinking water to purchasers, and being available to do so as insurance against highly variable rainfalls.
- Bulk water prices determined for SDP should apply to all water supplied by SDP to Sydney Water and other retailers. Prices set for supply direct to retail customers under SDP's retail licence will need to allow for appropriate transport and retail costs to be added to the bulk water price.
- To facilitate the emergence of other water retailers, or for SDP to supply other retail customers directly, Sydney Water intends to give IPART an access undertaking for its water network under the Water Industry Competition Act.
- The desalination plant was constructed on time and under budget by private companies chosen via a competitive process. The plant is operated and maintained by the private sector under a competitively tendered contract.

2.1 Need for a price determination

Sydney Desalination Plant Pty Limited (SDP) owns and operates the Sydney desalination plant at Kurnell. SDP is a wholly-owned subsidiary of Sydney Water Corporation. SDP sells treated water from the desalination plant to Sydney Water. The price that SDP currently charges Sydney Water is published on Sydney Water's website. An IPART determination of the maximum price for water from SDP will make the cost of desalination and the way it is estimated more transparent.

It is not expected that there would be any material change in Sydney Water's prices as a result of the price determination. IPART's last price determination set prices for Sydney Water that directly recovered SDP's efficient capital and operating costs. IPART-determined charges for SDP will be based on the same efficient capital and operating costs[1]. The cost of charges paid to SDP will then be passed through to customers in Sydney Water's prices in the same manner as currently applies to the charges paid by Sydney Water to Sydney Catchment Authority.

The prices charged by the Sydney Catchment Authority – the other bulk water supplier in Sydney – are determined by IPART. Regulation of SDP's prices will put SDP on a similar basis to the Sydney Catchment Authority. This will preserve a vertically separate industry structure for the urban water sector in Sydney.

Independent regulation will protect bulk water customers from monopoly pricing of water from the desalination plant. Price regulation should also ensure that, should SDP obtain other bulk water or retail customers, SDP will not be able to 'cherry pick' supply to other parties by charging rates that would see Sydney Water bear an inequitable share of SDP's costs.

[1] Renewable energy costs were not known at the time of the last Sydney Water price determination, and some other costs have been adjusted slightly, as detailed in the chapters below.

To achieve this, the maximum price for bulk water determined for SDP should apply to all water supplied by SDP to Sydney Water and other retailers. Prices set for supply to retail customers under SDP's retail licence will need to allow for appropriate transport and retail costs to be added to the bulk water price.

IPART's issues paper for this price determination has asked about the likelihood that a market for desalinated water will emerge in Sydney over the coming price path for SDP. SDP considers that there is every possibility that competition will emerge in the urban water sector in Sydney for the following reasons:

- the NSW Government has developed institutional arrangements, such as the Water Industry Competition Act 2006, which are now in place to facilitate competition in Sydney's urban water market;
- in other industries (eg. electricity) and jurisdictions (eg. the UK water industry), similar institutional reforms have resulted in substantial changes in market structure and behaviour and increased competition, particularly in retail competition as a first step, or in benchmark competition through different operators servicing different geographic areas within one city;
- the development of SDP, being a large scale new source of water, provides a catalyst for greater retail competition to emerge in Sydney's urban water market;
- prospective competitors of Sydney Water will have an incentive to sell water directly to customers if they can provide retail water services more cost efficiently than Sydney Water (i.e. at a lower cost for an equivalent level of service);
- structural reform of the urban water sector, to enable greater competition, is also being encouraged at the national level. A recent Productivity Commission report to the Commonwealth Government recommended options for structural reform to improve efficiency. One option reinforced the need for structural separation of the water supply chain, particularly the vertical separation of bulk water from distribution and retail, and the horizontal separation of competing bulk water suppliers.

To facilitate the emergence of competition in Sydney's urban water sector, Sydney Water intends to give IPART an access undertaking for its water network under the Water Industry Competition Act. This undertaking would include a charge for the transportation service provided by Sydney Water's water network. It would also build on the indicative terms and conditions of access to the water network, which Sydney Water previously provided to industry. Sydney Water also previously prepared indicative terms and conditions of access to the wastewater network, as well as a wastewater access charge, which was approved by the Australian Competition and Consumer Commission.

If retail prices and access prices are set at the appropriate level, there will be an incentive for other players to enter the retail market for water in Sydney, or to buy water directly from SDP.

2.2 Scope of the price determination

SDP owns the desalination plant, the plant's seawater intake and outlet tunnels and risers, and the drinking water pumping station. At the present time, Sydney Water intends to transfer the bulk water pipeline, which takes drinking water from the plant to the water distribution network at Erskineville, into SDP. This move reflects that the bulk water pipeline's only purpose is to deliver water from the desalination plant to the network, in much the same way as pipes owned by Sydney Catchment Authority deliver dam water to the network. Sydney Water intends to make the transfer before the start of the new SDP price determination (ie. before 1 July 2012).

In view of this, this submission to IPART has been prepared on the basis that the bulk water pipeline will be owned by SDP. As such, SDP's prices will need to be set to recover:

- the cost of operating and maintaining the desalination plant and the bulk water pipeline;
- a return on, and an amount for depreciation of, the desalination plant and pipeline assets; and
- charges for electricity to power the plant and renewable energy certificates to offset the plant's electricity use.

Figure 2.1 Energy recovery devices in the desalination plant

Renewable Energy

IPART's issues paper for its price determination queries whether SDP is seeking to recover the cost of renewable energy certificates. In relation to this issue, SDP notes that:

- the Project Approval for the Desalination Project, under the Environmental Planning and Assessment Act 1979, included a requirement that "the desalination plant will be powered by 100% renewable energy, or equivalent";
- in accordance with the Metropolitan Water Plan, Sydney Water was directed, under section 20P of the State Owned Corporations Act 1989, to build the desalination plant in accordance with the Project Approval, and to operate the desalination plant. The direction to operate the plant specified that "the desalination plant will be powered 100 per cent by accredited renewable energy"; and
- IPART was directed, under section 16A of the IPART Act, to include in Sydney Water's prices the efficient cost of complying with these directions to build and operate the plant, including the use of 100% renewable energy.

In accordance with the above directions, the cost of renewable energy certificates needs to be included in SDP's charges to Sydney Water so that this cost is reflected in Sydney Water's prices.

Setting aside the requirement to comply with directions from Government, IPART's issues paper suggests that the NSW Government, rather than Sydney Water customers, could pay for the additional cost of renewable energy compared to 'conventional power'. Under this option, taxpayers across NSW would pay for the cost of renewable energy to power Sydney's desalination plant. IPART's issues paper states that this may be appropriate if the use of green power reflected Government policy.

It is correct that the use of green power reflected Government policy at the time of the decision to build the desalination plant. However, there are multiple ways in which Government implements policy without providing concomitant funding, such as through planning consents and licence conditions. For example, compliance with the water and energy saving targets in Building Sustainability Index (BASIX) is a NSW Government policy and a condition of planning consent for new homes. The cost of compliance with BASIX is therefore part of the cost of developing a new home in NSW. Similarly, compliance with the Planning Approval for the desalination plant,

including the renewable energy requirement, is a cost of delivering desalinated water in Sydney.

Consistent with cost reflective pricing therefore, SDP's charges should include the cost of renewable energy certificates. This will ensure that the cost of providing desalinated water is borne by those who receive the associated water security benefits, and is not subsidised by water consumers outside of Sydney Water's supply zone. It will also ensure that water customers receive any benefit from the sale of surplus renewable energy certificates in the future.

It is also important to note that in this particular case the cost of renewable energy is not expected to be an ongoing burden. The contract for renewable energy certificates (RECs) has a fixed price that is linked only to the consumer price index and, given SDP's contractual commitment to buy RECs, SDP's electricity price precludes any pass-through of:

- any tax, levy, impost or charge relating to greenhouse gas or carbon emissions; or
- any cost arising from the introduction or operation of any emissions trading scheme.

Further, it is efficient for the price of renewable energy certificates to be included in the costs recovered from SDP's customers, to the extent that the cost of Renewable Energy Certificates properly reflects the externality cost associated with using 'conventional power'.

2.3 Pricing Principles

The Minister for Finance and Services has referred the price of water produced by SDP to IPART. The Terms of Reference for the referral contain a set of Pricing Principles as matters for IPART to consider when it makes its determination. The Terms of Reference are set out below.

Terms of Reference for Referral of Sydney Desalination Plant Pty Limited to IPART under Section 52 of the Water Industry Competition Act

Background

On 29 June 2010 Sydney Desalination Plant Pty Limited (SDP) was granted a network operator licence in relation to the desalination plant. The Minister for Finance and Services has, under section 51 of the Water Industry Competition Act 2006, declared that SDP is a monopoly supplier in relation to the water supply services it provides under its network operator licence.

SDP is the only supplier of non-rainfall dependant drinking water in New South Wales. Currently, the primary purchaser of drinking water supplied from the desalination plant is Sydney Water Corporation. Sydney Water Corporation purchases bulk water from two main sources, the Sydney Catchment Authority and, since its commissioning, the desalination plant.

The desalination plant is a key element in Sydney's water security plan. Under its network operator licence, the desalination plant is required to maximise water production when dam storage levels in Sydney are below a prescribed threshold. Prices set by the Independent Pricing and Regulatory Tribunal(IPART) should therefore reflect the water supply services provided by SDP set out below:

(a) the supply of non-rainfall dependant drinking water to purchasers; and

(b) the making available of the desalination plant to supply non-rainfall dependant drinking water.

Matters for consideration - pricing principles

Each price determination is to be consistent with the following pricing principles:

1. Maximum prices should be set so that expected revenue generated will recover the efficient costs of providing the services described at (a) and (b) above over the life of the assets. Costs include operating costs, a return on the assets and return of assets (depreciation).

2. In calculating the return on invested assets:
   i. The rate of return (or Weighted Average Cost of Capital) should reflect the commercial risks faced by the asset owner in providing the services.
   ii. IPART should determine an appropriate opening asset value.

3. Return of assets (depreciation) is to reflect the economic lives of the assets.

4. The structure of prices should encourage SDP to be financially indifferent as to whether or not it supplies water. As such the structure of prices should comprise separate charges for the different water supply services described at (a) and (b) above.

5. The charges for water supply services in (b) above should be a periodic payment and should reflect fixed costs including, return on assets, return of assets, and the fixed component of operating costs. SDP is to be entitled to charge for providing the water supply services in (b) above irrespective of levels of water in dam storages servicing Sydney or availability of water from other sources.

6. The charges for water supply services in (a) above should reflect all efficient costs that vary with output, including variable energy, labour costs, and maintenance costs.

7. Any other matters that IPART may consider relevant.

Timing

The determination period is to cover the period to 30 June 2017.

For each successive price determination period, IPART is to make the price determination at least 6 months before the expiry of the current determination period.

3 Operating Expenditure

Key points

- SDP's operating costs can be clearly identified. They include payments to Veolia under the operations and maintenance contract for the desalination plant; payments to Infigen for electricity and renewable energy certificates; and other operating and maintenance costs, including back office costs, insurance, land tax and council rates.
- SDP's total operating costs are projected to be $78 million in 2012-13 (real $ 2010-11), assuming the plant produces 90 gigalitres of water. This includes $48 million in variable costs, which change with the volume of water produced, and $30 million in fixed costs.
- The desalination plant has the flexibility to be switched off when it is not required. If the plant is switched off for a period of time, SDP's operating costs change. In particular, SDP's variable operating costs and some fixed costs are avoided or deferred; once-off costs are incurred to shut-down or restart the plant; and surplus electricity and renewable energy certificates may be sold, creating a gain or loss, depending on the market price at the time of sale.

There are three categories of operating costs incurred by SDP in providing desalinated water to Sydney Water. These include:

- operations and maintenance (O&M) costs – the payment to Veolia for the operation and maintenance of the desalination plant and associated infrastructure;
- renewable energy costs – payment for the supply of electricity and renewable energy certificates; and
- other costs – this includes all of the other operating and maintenance costs borne by SDP.

Table 3.1 outlines SDP's forecast operating costs to 2016-17 if the plant operates at capacity (ie. if it produces 250 megalitres of water per day or 90 gigalitres per year) for the duration of the price determination period.

Table 3.1 SDP Operating Expenditure Forecast 2010-11 to 2016-17 ($ 2010-11, $M)

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Desalination plant							
Operating and Maintenance Costs	27.4	29.5	30.5	34.1	36.6	36.3	34.6
Electricity Costs	21.3	23.6	24.9	26.2	27.5	27.9	28.0
Renewable Energy Costs	14.2	17.9	18.8	19.8	20.5	20.5	20.5
Other Operating Costs	3.5	4.1	3.9	3.4	3.1	3.3	3.5
Total	**66.4**	**75.0**	**78.1**	**83.5**	**87.8**	**88.0**	**86.6**

SDP's operating expenditure is demonstrably efficient because it is largely incurred under contracts that were let through a competitive tendering process. SDP's non-tendered costs (4-5% of total operating costs) are also efficient because they are generally set by third parties (eg. council rates, land tax, bank fees) and therefore cannot be controlled by SDP.

SDP's competitively tendered operating costs include the cost of the O&M contract with Veolia, and the cost of SDP's renewable energy contracts. Selection of the preferred tenderers for these contracts involved a thorough assessment of proposals received from a good field of highly qualified proponents. Expressions of interest were received from four proponents for the O&M contract and 13 groups responded to the initial request for proposals for the renewable energy contracts. The preferred proponent for each contract was selected after a comprehensive evaluation of proposals against a set of mandatory and desirable criteria.

The desalination plant started producing water in January 2010 and the plant was officially handed over to SDP on 15 June 2010. At the 2008 determination of Sydney Water's prices, Halcrow reviewed the efficiency of Sydney Water's operating expenditure which, at the time, included SDP's operating expenditure. Halcrow's findings reinforced that SDP's costs are efficient. Further detail on the processes followed to enter into SDP's contracts is at Appendix One.

3.1 Costs when the plant is operating

Table 3.2 outlines SDP's total operating costs when the desalination plant is producing 90 gigalitres per year, or about 15 per cent of water demand. These costs include costs of the O&M contract with Veolia, costs of electricity and renewable energy certificates and SDP's other operating costs.

Table 3.2 SDP's Fixed and Variable Operating Costs when supplying water ($ 2010-11, $M)

	2012-13	2013-14	2014-15	2015-16	2016-17
Desalination plant supplying water					
Fixed operating costs	30.1	33.7	36.7	36.2	34.0
Variable operating costs	48.0	49.8	51.1	51.9	52.6
Total	**78.1**	**83.5**	**87.8**	**88.0**	**86.6**

Operating and Maintenance Costs

The payment from SDP to Veolia is expected to be $30.5 million (real $ 2010-11) in 2012-13, assuming the plant produces 90 gigalitres of water. This payment covers both fixed and variable costs under the O&M contract.

The variable costs under the O&M contract relate to the cost of treating water. This cost primarily relates to the cost of chemicals used in treating desalinated water to meet the Australian Drinking Water Guidelines and other quality specifications. The water treatment costs vary broadly in proportion with the volume of water produced by the desalination plant. Under the O&M contract, changes in the price of chemicals are passed through to SDP.

SDP's payments to Veolia also cover an energy efficiency adjustment, which allows Veolia to share the savings in SDP's energy costs if the desalination plant operates at a higher than target level of efficiency. The adjustment also provides that Veolia incurs some of the additional energy costs if the plant is less efficient than the target level.

The level of efficiency of the desalination plant increases with the volume of water produced. The plant's efficiency is also related to the age of the membranes used by the plant, the temperature of ocean water to be desalinated, and the volume of dissolved solids in that water.

The fixed costs to SDP under the O&M contract with Veolia do not vary with the volume of water produced. However, the annual cost for many of these items is not the same every year. For example, significantly more maintenance expenditure is required as the plant ages.

Fixed costs covered by SDP's payments to Veolia include the cost of:

- membrane replacement;
- routine and periodic maintenance;
- fixed labour costs;
- insurance;
- overheads;

- laboratory and testing costs; and
- a range of other miscellaneous costs (eg. training, consumables, waste, and phone costs).

SDP's payments to Veolia under the O&M contract include the actual cost incurred by Veolia for membrane replacement, periodic maintenance and insurance. The O&M contract includes mechanisms to ensure that these costs are efficient. For example, SDP can require Veolia to seek additional quotes if SDP's considers that Veolia's insurance costs do not represent value for money.

Over the price determination period, the cost of the O&M contract is forecast to increase initially and then stabilise, assuming the plant operates for the full determination period. The primary drivers for this trend are maintenance and membrane replacement costs. Only limited maintenance and membrane replacement are required in the first years of operation of the plant. These costs ramp up to relatively stable levels after four years.

Figure 3.1 Reverse osmosis membranes in the desalination plant.

Renewable Energy Costs

The costs incurred by SDP under its renewable energy contracts with Infigen include electricity usage charges, network charges, and charges for renewable energy certificates (RECs). The components of these charges are detailed below. As noted in Table 3.1, SDP's total electricity costs are expected to be $24.9 million ($ 2010-11) in 2012-13, if the plant produces 90 GL. The cost of purchasing RECs is expected to be $18.8 million.

The total cost of electricity and RECs is expected to increase slightly over the term of the determination. This is due to the initial ageing of the plant's membranes, which use more power as they get older. This trend is expected to end after around four years of operation, as membrane replacement reaches a steady asset replacement regime. Increases in the cost of electricity are also forecast due to rising network charges, which are subject to independent price regulation and cannot be influenced by SDP.

Electricity Usage Charges

SDP's costs of electricity usage charges are based on:

- variable electricity use costs, based on a fixed, real per megawatt hour rate;
- an annual minimum volume commitment; and
- a contract maximum for the site energy load.

If the plant produces 90GL of water per year, electricity use is likely to exceed the minimum volume and not exceed the maximum load, so the cost of electricity will be based on the fixed contract price.

Network electricity charges

SDP's network electricity charges are set by Ausgrid and regulated by the Australian Energy Regulator. SDP pays a Cost Reflective Network Price which, when the plant is operating, includes:

- variable network use costs, based on a fixed real per megawatt hour charge;
- a fixed daily network access charge; and
- a network capacity charge that depends on the maximum load that the plant places on the electricity network in the preceding 12-months.

Figure 3.2 The Capital Wind Farm at Bungendore

Renewable Energy Certificate Costs

SDP's cost of purchasing Renewable Energy Certificates (RECs) produced by Infigen's Capital Wind Farm is based on:

- a fixed real price per REC; and
- a commitment for SDP to by a fixed minimum number of RECs per year.

The annual cost of RECs will therefore be a fixed real cost based on the contract price for RECs.

Other Operating Costs

SDP's other operating costs are expected to be $3.9 million ($ 2010-11) in 2012-13, if the plant produces 90 GL of water. These costs include:

- minor operating and maintenance costs for the bulk water pipeline from the desalination plant to Sydney Water's network;
- insurance;
- council rates and charges;
- land tax;
- audit and bank fees;
- the Marine Monitoring Program, which was a condition of the planning consent for the plant and concludes after three years; and
- corporate/administrative functions, which are currently performed by Sydney Water under a Service Level Agreement.

SDP's direct costs also include a safety incentive mechanism, which provides for Veolia to receive up to $50,000 per year extra for an outstanding safety performance.

3.2 Costs of not operating

Under the O&M contract, SDP is able to shut down the desalination plant. There are four different types of shutdown that the plant can be put into:

- Short term: 2 to 10 days;
- Medium term: 11 to 90 days;
- Long term: 91 days to 2 years; or
- Water security mode: 2 to 5 years[2].

Appropriately timed shut-downs[3] will enable SDP to meet the operating rules for the desalination plant, which are prescribed in its Network Operator Licence. As noted previously, these rules are that SDP must operate the desalination plant to maximise the production of drinking water when dam storages fall below 70 per cent of their capacity, until dam storages return to 80 per cent. It is unlikely that Short-term of Medium-term shut-downs will be necessary under the Network Operator Licence, given the rate at which dams deplete.

Table 3.3 outlines SDP's operating costs, including the fixed and variable components, when the desalination plant is not operating. This includes:

- daily standby payments to Veolia;
- payments to Veolia for fixed O&M costs, minus savings in some fixed costs;
- electricity costs minus revenue from selling unused electricity;
- costs of renewable energy certificates minus revenue from selling surplus certificates;
- SDP's other operating costs (eg. insurance, taxes and operating costs for the bulk water pipeline from the plant to Sydney Water's network).

Note that the fixed costs in Table 3.3 are based on the costs of a long-term shutdown.

SDP also incurs once-off payments to shutdown and, later, to restart the plant. The costs associated with a shutdown are detailed further below.

[2] When a shutdown is approaching five years in duration, the O&M contract has provisions requiring SDP and Veolia to make arrangements for the plant beyond the fifth year.

[3] SDP is required to give Veolia notice if the plant is to be shut down. The notice periods are: 48 hours for a short term shutdown; 4 weeks for a medium term shutdown; and 8 weeks for a long term or water security mode shutdown. There are also notice periods if the shutdown is to be extended or if the plant is to be restarted.

Table 3.3 SDP's Fixed and Variable Operating Costs in shutdown ($ 2010-11, $M)

	2012-13	2013-14	2014-15	2015-16	2016-17
Desalination plant not supplying water					
Fixed operating costs	25.4	26.1	27.4	27.3	27.6
Variable operating costs	0.0	0.0	0.0	0.0	0.0
Total	**25.4**	**26.1**	**27.4**	**27.3**	**27.6**

Shutdown and restart payment

SDP is required to make once-off payments to Veolia if the plant is placed into medium term, long-term or water security mode shutdown. These payments increase with the length of the shutdown.

SDP is also required to make once-off payments to Veolia to restart the desalination plant from a medium term, long term or water security mode shutdown. As with shutdown payments, the restart payments increase with the length of the shutdown. SDP must also reimburse Veolia for costs incurred if there are any cancelled restarts.

Standby O&M cost

SDP makes daily standby payments to Veolia if the desalination plant is shutdown. The standby payment is higher when the plant is in a short term shutdown as it covers the cost of operating the plant for eight hours per day at 25 per cent of its capacity (eg. costs of labour and chemicals). The standby payment is lower for a medium term or long term shutdown, and lower still for a water security mode shutdown. These payments cover the cost of extra security required when the plant isn't operating, chemicals to preserve the membranes, and some other minor costs incurred by Veolia when the plant is not operating for 11 days or longer.

Fixed O&M costs in shutdown

When the desalination plant does not operate, SDP continues to incur many fixed costs under the O&M contract. However, some of the fixed costs are lower when the plant is shutdown than when it is operating. In particular, in a medium term, long term or water security mode shutdown, there are significant savings in labour costs, laboratory costs and overheads.

If there is a long term or water security mode shutdown, some membrane replacement and periodic maintenance may also be avoided. The membrane replacement schedule under the O&M contract includes a 'stop the clock' mechanism so that some costs are deferred and some costs at the very end of the contract are avoided altogether if there is a long-term or water security mode shutdown. Periodic maintenance has a similar mechanism.

Energy costs

Retail charges

The minimum amount of electricity used by the plant when it is not operating, is 9,000 MWh per year. This is the amount required in a medium term shutdown. Some additional electricity is required in a short term, long term or water security mode shutdown.

SDP has a minimum volume commitment for electricity usage. Excess electricity can be sold on the spot market or to another buyer. As a result, SDP's retail electricity costs when the plant is not operating are at least:

- 9,000 MWh x the contract electricity price; plus
- (Minimum load commitment – 9,000 MWh) x (spot price – contract price).

Note that the electricity spot price is measured in half-hourly increments. Also note that, in practice, sale of any excess electricity other than in the spot market (e.g., under a long-term contract) would require a marketable volume of power and enough lead-time to find a buyer and negotiate the necessary arrangements.

Network charges

When the plant is not operating, SDP's Cost Reflective Network Price for electricity changes as a result of the reduction in electricity use. The main changes are:

- the variable charge increases;
- the daily access charge drops; and
- the capacity charge eventually reduces somewhat but is based on the load of the plant in the preceding 12-month period, so there will be a delay before the charge decreases.

RECs

If the desalination plant is not operating, SDP's cost of RECs will comprise:

- the cost of buying the committed minimum number of RECs; minus
- the revenue from selling surplus RECs (as less than the minimum commitment amount of RECs will be required to offset the plant's energy use in shutdown).

SDP is required to place a firm order for RECs six months before the start of each calendar year. Therefore, if dam levels unexpectedly rise above 80 per cent (meaning the plant can be switched off) after RECs have been ordered, SDP will have surplus RECs, which it will need to sell.

Other Operating Costs

SDP's other operating costs (ie. insurance, taxes, corporate costs and minor operating and maintenance costs for the bulk water pipeline) do not change when the desalination plant is shut down.

3.3 Summary

In view of the changes in SDP's costs when the plant does not operate, SDP's operating costs can be categorised as follows:

- variable costs, which change broadly in proportion with the volume of water produced by the desalination plant and primarily comprise water treatment and energy costs;
- baseline fixed costs incurred when the desalination plant is not operating, such as the cost of network connection and a minimum level of electricity; and
- additional fixed costs that are only incurred when the desalination plant is operating.

Given the changes in SDP's costs when the plant does not operate, SDP's operating costs will depend on the volume of water produced by the plant, which in turn depends on dam levels (as a result of the Metropolitan Water Plan Operating Rules).

Table 3.4 presents SDP's total operating costs (ie. O&M costs, energy costs, SDP's direct costs, and shutdown and restart costs where relevant) under a number of possible scenarios. The table demonstrates the significant changes in costs that may occur as a result of the plant being switched on or off. For example, if the plant operates at capacity in 2012-13, SDP's operating costs

would be around $78 million ($2010-11). If the plant is instead in water security mode shutdown in 2012-13, SDP's operating costs would be around $20 million ($2010-11).

Note that Table 3.4 excludes any adjustment for the sale of surplus electricity or RECs, which is the source of the most significant potential variance in actual costs from forecast costs.

Table 3.4 SDP Operating Expenditure Scenarios ($M, $2010-11)

Scenario	2012-13	2013-14	2014-15	2015-16	2016-17
Operate at capacity for determination period	78.0	83.4	87.7	87.9	86.6
Operate at capacity for determination period except for three-month Medium Term Shutdown at the end of 2016-17.	78.0	83.4	87.7	87.9	70.5
Operates at capacity in year one, Medium Term Shutdown for three months of year two, operates at capacity for remainder of determination.	78.0	74.8	87.7	87.9	70.5
Operates at capacity in year one, Long Term Shutdown in years two to five.	78.0	52.8	22.6	31.1	26.1
Operate at capacity in year one, Long Term Shutdown in year two, operate at capacity for the remainder of the determination.	78.1	25.5	85.6	89.2	89.3
Water security mode shutdown for full determination period	20.4	18.2	18.0	18.0	30.9

4 Weighted Average Cost of Capital

Key points

- IPART uses the Weighted Average Cost of Capital (WACC) to determine a key component of SDP's annual revenue requirement, the return on assets.
- The Weighted Average Cost of Capital for SDP should be 7.8 per cent to allow SDP to meet its interest payments; generate a return on the capital invested; and include an allowance for SDP to manage its retained risks.
- Both market and business specific risks need to be considered in setting the WACC for SDP, which owns a single asset and has (at this time) only one customer so cannot diversify its cost and revenue risk.

The return on assets is a critical element in the cost recovery framework for a capital intensive business like SDP. The return on assets represents a return to debt and equity holders for committing capital to SDP and bearing the risks associated with providing its services. It is key to ensuring the ongoing financial viability of SDP and to providing incentive for efficient investment in essential water infrastructure.

An appropriate return on assets is required to ensure that SDP can meet its interest payments; generate a return on the capital invested; and include an allowance for SDP to manage its retained risks. This is consistent with the Pricing Principles set by the Minister for Finance and Services for this price determination. Specifically, the Pricing Principles state:

> *The rate of return (or Weighted Average Cost of Capital) should reflect the commercial risks faced by the asset owner in providing the services.*

IPART uses a real pre-tax weighted average cost of capital (WACC) to determine the return on assets that a regulated entity may recover through its charges. IPART's formula for calculating the WACC is in Box 4.1.

Box 4.1 How the WACC is calculated

$$\text{WACC real pre-tax} = \frac{\left(1+\left\{\frac{R_e}{\left[1-t\times(1-\gamma)\right]}\times\left(\frac{E}{D+E}\right)+R_d\times\frac{D}{D+E}\right\}\right)}{(1+i)}-1$$

where:

Rd = the nominal cost of debt

Re = the nominal cost of equity, calculated as Rf + βe * (Rm- Rf)

Rf = the nominal risk free rate

Rm = the nominal weighted expected return of the whole market.

βe = Beta, a measure of the risk of the asset relative to the market index

(Rm – Rf) = the market risk premium over the risk-free rate

t = the statutory tax rate

γ = Gamma, the value attributed to imputation tax credits

E = the amount of equity in the capital structure

D = the amount of debt in the capital structure

i = inflation rate

Table 4.1 outlines the proposed values for each of the parameters used in the calculation of the WACC for SDP. Based on these parameters, the real pre-tax WACC for SDP is 7.8 per cent. Some of the parameter values differ from those proposed by IPART in its recent review of WACC parameter values for regulated entities. The reasons for the differences, which are detailed further below, relate to:

- the risk assumptions made in calculating the equity beta;
- market practices for the equity gamma value;
- the methodology for calculating the inflation rate;
- the term to maturity chosen in calculating the risk free rate, the debt margin and inflation; and
- the bond sample used to derive the debt margin.

Table 4.1 WACC Parameter Proposals for SDP

	SDP proposal
Nominal risk free rate	5.20%
Real risk free rate	2.60%
Inflation	2.60%
Market risk premium	6.00%
Debt margin over risk free rate	3.42%
Debt to total assets	60.0%
Gamma	0.25
Tax rate	30.0%
Equity beta	0.90
Cost of equity (nominal post-tax)	10.60%
Cost of debt (nominal pre-tax)	8.62%
WACC (nominal pre-tax)	10.60%
WACC (real pre-tax)	**7.80%**

4.1 SDP's commercial risks

The equity beta in the WACC calculation is a key measure of the riskiness of an investment. Businesses face two types of risk; market risk and business specific risk, where:

- market (or systematic) risk is the variation in revenue and profitability due to variations in general economic parameters such as economic growth, employment and inflation; and
- business specific (or unsystematic) risk is a risk associated with a particular investment that can be eliminated (in theory) through investing in a diversified portfolio.

Ultimately all risks need to be priced into the costs of a service. The Capital Asset Pricing Model (CAPM), when applied in a regulatory pricing context, often assumes a diversified business with multiple customers and the ability to manage specific risks through cash flows. However, SDP owns a single asset and has (at this time) only one customer. Over the course of the determination other customers may come forward, however SDP cannot diversify its cost risks. IPART typically does not allow utilities to accommodate specific risks in operating costs. As such, all commercial risks for SDP need to be considered in setting the equity beta.

A number of the risks associated with the assets owned, operated and maintained by SDP have been transferred to the contractor and operator under the D&C and O&M contracts for the desalination plant. Some other risks would be partially or wholly passed through to Sydney Water and, ultimately, water customers in Sydney, under the prices proposed in Chapter 6 of this

submission. However, not all risks have been transferred. To do so would neither optimise the allocation of risk nor provide value for money. Consequently, a number of risks are either partially or wholly retained by SDP. These risks are detailed in Appendix 4 and include risks relating to:

- SDP's assets – including risks that warranties are not honoured, a significant plant component breaks down, the plant technology becomes outdated and inefficient and new technology cannot easily be adopted, or there is technical obsolescence or innovation, which results in replacement equipment being unavailable.
- SDP's marine pipelines – including risks that the intake/outlet is damaged (eg. by a vessel or anchor);
- Bulk water pipeline – including risks that the pipeline is damaged (including sections that are under water or underground and therefore unobservable), maintenance takes longer or costs more than anticipated, cathodic protection of the pipeline is not maintained, there is a security breach, poor maintenance leads to water quality problems, or concrete and other materials in contact with groundwater experience accelerated deterioration.
- Membranes – including risks that membrane costs increase more than forecast, membrane manufacturers cannot supply goods, or the type of membranes required are no longer available and this results in refurbishment costs not forecasted.

Figure 4.1 Connection of the bulk water pipeline to Sydney Water's network.

- Energy – including risks that usage differs from forecast and SDP is subject to the differential between the market and contract price for energy, REC usage is below the minimum purchase requirements or differs from forecast and SDP is subject to the differential between the market and contract price for RECs, there is a power interruption, failure of the dedicated transmission line to the site, or insufficient system wide power capacity, or the REC scheme is discontinued.
- Chemicals – including risks that SDP is subject to greater than forecast chemical price increases, a specialist chemical supplier cannot supply the required chemicals, or the type of chemicals required are no longer available and resulting in refurbishment costs not forecast.

- Labour – including risks that SDP is subject to higher than forecast labour cost increases, there is industrial action that disrupts SDP's ability to supply water, or the operator is not able to source or train sufficient skilled staff to operate the plant.
- Environment – including risks that there is damage to property / environment due to marine pipeline failure or chemical leakage, that environmental licence/regulations requirements change and lead to significant additional costs (e.g. change in waste disposal requirements).
- Safety - Risk that there is a major safety incident interrupting the ability of the plant to operate.
- Shutdowns – including that the plant takes longer than anticipated to restart, the plant is restarted too late, a major refurbishment is required to recommission the plant or SDP is not able to source trained operators after a water security mode shutdown.
- Seawater – risk that raw seawater quality adversely changes, increasing energy use, chemical cost, and potentially resulting in inability for the existing plant to treat seawater.
- Drinking water - risk that drinking water requirements change, increasing energy use, chemical cost, and potentially resulting in inability for the plant to meet the requirements.
- Operator – including risks that the operator makes an error so that the plant doesn't operate efficiently or discharges out of specification wastewater or desalinated water, the operator becomes insolvent, or abandons the project, or the operations contract is terminated early due to operator failure to meet their obligations and there is a delay in finding a replacement operator or the new operator significantly increases the costs of operations.
- Operator/Sydney Water – including risks that key operational interfaces are not managed properly, or water is not appropriately tested and poor quality water gets into the transfer pipeline.
- Other – including risks of a security breach, of insurance premiums increasing beyond forecast levels, of new taxes being imposed, of force majeure events, or significant change to the asset or desalination process due to political considerations and community protest

A number of these risks, if they eventuate, would reduce the availability of the plant. In turn, as set out in section 6.5 on abatement, this could have revenue implications for SDP.

4.2 Inflation Rate

The inflation rate is used to convert the nominal WACC to the real WACC. IPART has proposed that the inflation rate should be based on 10-year market swap models instead of a non-market based approach.

This is not supported. SDP proposes to use instead an approach to estimating the future inflation rate applied by the Australian Energy Regulator (AER). AER uses the RBA's short-term inflation forecasts - currently extending out to two years - and adopts the mid-point of its target inflation band (2.5%) beyond that period for the remaining eight years. Averaging these individual forecasts derives an implied 10-year forecast. An example follows:

Table 4. 2 Inflation calculation assumptions

RBA's forecast		Mid-point of the RAB's target inflation band							
Jun-2013	Jun-2014	Jun-2015	Jun-2016	Jun-2017	Jun-2018	Jun-2019	Jun-2020	Jun-2021	Jun-2022
3.00%	3.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%

Geometric average = 2.59%

Setting the inflation rate this way would provide more stability for the WACC regulatory outcomes. It would eliminate the impact of temporary inflation spikes, which are typically corrected through the RBA's monetary policy actions.

4.3 Term to Maturity

In its calculation of the WACC for regulated entities, IPART proposes to reduce the term to maturity used in its assumptions of the debt margin, inflation and the risk free rate from 10 years to 5 years. This change is intended to bring the term to maturity closer to the length of the regulatory period.

SDP opposes this proposal for the following reasons:

- Water utilities typically fund their capital needs using a debt portfolio with a significantly longer average term to maturity. This reflects assets with a significantly longer useful life. SDPs assets have economic lives of between 15 and 140 years.
- No regulated business re-finances a large portion of its debt according to the start/end of the regulatory period. This would expose the business to the volatility of financial markets, very likely increase fund raising costs and increase the business' exposure to systematic risk.
- Inclusion of bonds with a remaining life significantly below the bond initial term to maturity reduces the average remaining term to maturity even further, below 5 years.
- Reducing the term to maturity assumptions does not reflect typical business practices, or the cost of capital of a benchmark company. In effect, it only artificially reduces the WACC rate.
- Longer term debt where interest rate risk is swapped off for terms to match the regulatory period will still attract a premium on swap equal to the long term rate embedded in the original debt.

4.4 Debt Margin

IPART has proposed changes to the bond sample used to derive the debt margin used to calculate the WACC for regulated entities. SDP supports the exclusion of bonds with a AAA credit rating, as proposed by IPART. However, SDP does not support the inclusion of US bonds. This approach would distance the WACC calculation from market conditions and business practices directly relevant to SDP and other Australian water businesses.

To address a possible shortage of Australian bonds with the relevant rating and term to maturity, the proposed debt margin is based on the Bloomberg 7-year fair value yield curve. This could be extrapolated to 10 years to more closely match a typical utility's debt profile.

4.5 Gamma

The Australian Energy Regulator's Final Decision in its Review of the WACC parameters for electricity transmission and distribution network services (May 2009) did not dispute that the standard market practice in Australia is to exclude the value of imputation credits from rate of return analysis. That said, the Australian Competition Tribunal recently determined that Gamma should have a value of 0.25. Accordingly, SDP proposes that gamma be in the range zero to 0.25.

5 Annual Revenue Requirement

Key points

- SDP's annual revenue requirement, including the cost of the water delivery pipeline, is $264 million in 2012-13, falling to $261 million in 2016-17. This includes an annual revenue requirement of $211 million in 2012-13 for the desalination plant and $54 million for the pipeline.
- SDP's annual revenue requirement is based on the Building Blocks approach, including a pass-through of operating costs, and a return on and of a regulated asset base of $1,927 million. This includes a regulated asset base of $1,280 million for the desalination plant and $646 million for the pipeline.

SDP's annual revenue requirement has been calculated using the Building Blocks approach. IPART uses the Building Blocks approach to calculate the annual revenue requirement for regulated entities.

Under the Building Blocks approach, SDP's annual revenue requirement is the sum of efficient operating costs, a return on SDP's assets and depreciation. This is consistent with the Pricing Principles established for SDP's price determination, which include that:

> *Maximum prices should be set so that expected revenue generated will recover the efficient costs of providing the services … over the life of the assets. Costs include operating costs, a return on the assets and return of assets (depreciation).*

Excluding the bulk water pipeline, SDP's annual revenue requirement, calculated using the building blocks approach, is $211 million in 2012-13, falling to $209 million in 2016-17. Table 5.1 below presents the annual revenue requirement for each year of the determination period.

Table 5.1 SDP Annual Revenue Requirement ($ 2010-11, $'000)

	2012-13	2013-14	2014-15	2015-16	2016-17
SDP					
Return on Assets	96,237	93,653	91,021	88,323	85,748
Depreciation	34,917	35,006	35,069	35,101	35,241
Return on Working Capital	1,465	1,449	1,455	1,424	1,383
Operating Costs	77,888	83,281	87,610	87,800	86,536
Total	210,506	213,390	215,155	212,649	208,907
Distribution Pipelines					
Return on Assets	48,544	48,196	47,847	47,498	47,149
Depreciation	4,471	4,471	4,471	4,471	4,471
Return on Working Capital	496	493	489	486	483
Operating Costs	100	100	100	100	100
Total	53,612	53,260	52,908	52,556	52,204
Total					
Return on Assets	144,782	141,849	138,868	135,821	132,898
Depreciation	39,388	39,478	39,540	39,572	39,712
Return on Working Capital	1,961	1,942	1,944	1,911	1,866
Operating Costs	77,988	83,381	87,710	87,900	86,636
Total	264,118	266,650	268,062	265,204	261,111

The annual revenue requirement is forecast to fall slightly over the term of the price determination. This is because the return on SDP's assets is declining as the RAB is depreciated over its economic life. This decline in the return on assets is offset in some years by increasing operating costs, due largely to membrane replacement and maintenance requirements.

As noted above, the return on assets in the Annual Revenue Requirement calculation for SDP assumes a weighted average cost of capital (WACC) of 7.8 per cent. Other components of the annual revenue requirement for SDP are outlined below.

5.1 Regulated Asset Base

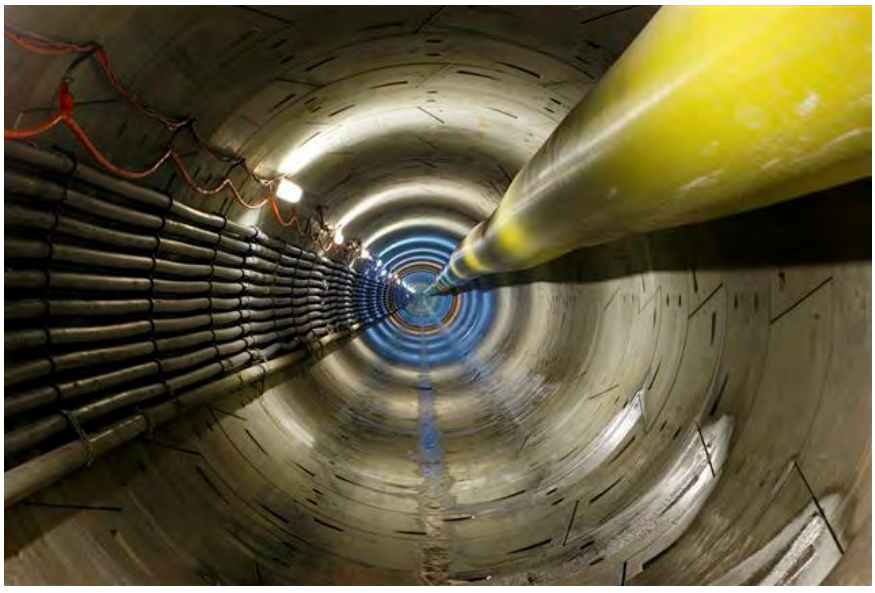
The return on, and return of, assets included in the annual revenue requirement calculation for SDP is based on a Regulated Asset Base (RAB) of $1,927 million, as at 1 July 2012. This includes a regulated asset base of $1,280 million for the desalination plant and $646 million for the bulk water pipeline.

This figure was derived from capital expenditure incurred to deliver the plant, the seawater intake and outlet connections, the drinking water pumping station, the bulk water pipeline from the desalination plant to Sydney Water's distribution network, and the land on which desalination plant is located.

Table 5.2 Regulated Asset Bases – Opening Value as at 1 July 2012 ($ 2010-11, $,000)

SDP	1,280,468
Distribution Pipeline	646,181
Total	**1,926,650**

Figure 5.1 The desalination plant's seawater intake connection



The RAB includes a small amount of planned capital expenditure, which is expected to be incurred over the term of the new price determination period (see Table 5.3). This includes $3.7 million over 2012-13 and 2013-14 for a back-up electricity feeder (i.e., a power cable connecting the Plant to the local substation) required when Ausgrid decommissions 33kV feeders in the Kurnell area. It also includes $1.0 million in 2015-16 and $3.3 million in 2016-17, which is required to fund periodic maintenance requirements. SDP has assumed that all periodic maintenance incurred from early 2016 can be treated as capital expenditure.

The O&M contract includes an indicative schedule of both periodic and routine maintenance for the desalination plant. The O&M contract also requires Veolia to develop and implement an Asset Management Plan to ensure that the desalination plant operates reliably, and that the asset lives specified in the D&C contract are not compromised. To meet this requirement, SDP's prices need to include a component to fund future capital expenditure on periodic maintenance of the plant.

Table 5.3 Future SDP Capital Expenditure ($ 2010-11, $'000)

	2012-13	2013-14	2014-15	2015-16	2016-17
Civil	0	0	0	0	0
Electronic	0	0	0	0	0
Mechanical	0	0	0	996	3,349
Electrical	1,116	2,604	0	0	0
Non-depreciating	0	0	0	0	0

Past capital expenditure to deliver the desalination plant and the bulk water pipeline is outlined in Appendix 2.

5.2 Asset Lives

The proposed annual revenue requirement for SDP includes an amount for depreciation of SDP's assets. The amounts allowed for depreciation are based on straight-line depreciation, taking into account the opening values of each asset category, as at 1 July 2012, and the remaining economic lives of each asset.

Table 5.4 outlines the economic lives used in the depreciation calculation (these are the total economics lives; remaining lives are lower for those assets that have already been constructed). The economic lives of the desalination plant assets are consistent with those determined by IPART for the desalination plant in its 2008 Sydney Water determination. For the bulk water pipeline, the economic lives are consistent with those determined by IPART for Sydney Water's potable water infrastructure. The asset lives were calculated with reference to the engineering life for each asset category.

Table 5.4 Asset Categories and Economic lives

	Proposed Economic Lives
Original SDP Assets	
Plant	30
Intake Infrastructure	90
Outlet Infrastructure	100
Pumping Station	25
Pre-operations Payment	20
Sydney Water Related Costs	44
Non-depreciating	NA
Future SDP Capital Expenditure	
Civil	90
Electrical	20
Mechanical	15
Electronic	15
Non-depreciating	NA
Distribution Pipeline	
Civil	140
Electrical	30
Mechanical	40
Electronic	15
Non-depreciating	NA

5.3 Operating Costs

Under the building block approach, operating costs are a direct pass-through to prices. Annual operating costs are therefore directly included in SDP's annual revenue requirement for the determination period. For the purpose of calculating the annual revenue requirement, operating costs have been calculated using the assumption that the desalination plant will operate for the duration of the price determination period.

However, if the plant does not operate for part of the determination period, SDP's operating costs will change. The pricing structure proposed in Chapter 6 aims to ensure that cost risks are appropriately allocated between SDP and its customers.

6 Proposed Charges

Key points

- When the plant operates SDP should charge a variable charge of $533.30 per megalitre ($ 2010-11) in 2012-13 to recover its variable operating costs and an availability charge of $592,400 per day ($ 2010-11) to recover its fixed operating costs and its capital costs.
- When the plant is shut down costs are reduced, however, it is difficult to predict in advance when the plant will not operate. It is important the community benefits from lower shutdown costs and that SDP receives revenues that are appropriate to its costs. SDP proposes that there be a lower availability charge of $579,500 per day ($ 2010-11) to recover baseline fixed operating costs and capital costs when the plant is shut down.
- When the plant is shut down, there should also be adjustments to: accommodate potential gains or losses on the sale of surplus electricity and renewable energy certificates; enable SDP to recover the once-off costs of shutting down or restarting the plant; and accommodate unpredictable variability in fixed costs, where that variability exceeds a risk-sharing collar of ± 2%.

6.1 Introduction

IPART was asked to consider a set of Pricing Principles set by the Minister for Finance and Services for this determination. The Principles include that the structure of prices should encourage SDP to be financially indifferent as to whether or not it supplies water. This is to ensure that SDP does not have an incentive to depart from the operating rules set by the Metropolitan Water Plan and reflected in SDP's Network Operator licence. Consistent with this requirement, the Pricing Principles also state that SDP's prices should include:

- a charge for water availability, which should be a periodic payment and should reflect fixed costs including, return on assets, return of assets, and the fixed component of operating costs; and
- a charge for water supply services, which should reflect all efficient costs that vary with output, including variable energy, labour costs, and maintenance costs.

6.2 Price when the desalination plant operates

Consistent with the Pricing Principles, it is proposed that the maximum price of water from SDP, when it is producing water in accordance with its Network Operator Licence, should comprise:

- an availability charge that recovers a return on and of SDP's assets, and all of SDP's fixed operating costs; and
- a variable charge that recovers all of SDP's other operating costs – ie. the incremental costs that vary according to the quantity of water produced. These variable operating costs include:
    - water treatment costs (mainly chemicals and some labour);
    - variable retail electricity charges;
    - variable network electricity charges; and
    - costs of renewable energy certificates.

Table 6.1 outlines the proposed variable charge and availability charge that would apply when the desalination plant is operating. In 2012-13, the variable charge would be $533.3 per megalitre ($ 2010-11) of water supplied and the availability charge would be $592,400 per day ($ 2010-11).

Table 6.1 Proposed Availability and Variable Charges when operating ($ 2010-11)

	2012-13	2013-14	2014-15	2015-16	2016-17
Desalination plant supplying water					
Availability charge 1 ($'000 / day)	592.4	594.4	594.6	584.8	571.1
Variable charge ($ / ML)	533.3	553.4	568.3	576.2	584.6

In circumstances where SDP is producing water under its Network Operator Licence for the entire determination period, the proposed availability and variable charges provide a revenue stream for SDP that is appropriate given the costs and risks to which it is exposed.

6.3 Price when the desalination plant is switched off

It is possible that SDP will be shut down for prolonged periods of time, although the timing and duration of these periods is uncertain. This is an unusual situation for a substantial infrastructure asset and arises as a result of the high variability of rainfall over Warragamba Dam, which provides about 80 per cent of the water supply for Sydney. SDP is required to perform a service to complement this variability (i.e., providing the ability to reduce average costs for water consumers by shutting-down operations at the plant when dam levels are relatively high).

When the desalination plant is available but not producing water, in accordance with SDP's Network Operator Licence, SDP's variable charge will not apply. However, an availability charge will be required to ensure SDP can recover its fixed costs. This includes a return on and of SDP's assets and the fixed operating costs incurred when the plant is in shutdown.

As described earlier, SDP has two levels of fixed operating cost:

- a base level that is incurred whether or not the plant is operating ("Availability Costs"):
    - insurance costs;
    - fixed labour costs;
    - periodic maintenance;
    - fixed electricity costs;
    - projected electricity standby costs;
    - land tax and council rates;
    - audit and bank fees; and
    - the cost of the marine and estuarine monitoring program; and
- incremental fixed costs that are incurred only when the plant is producing water, but that do not vary with the volume of water produced ("Incremental Fixed Costs"). These costs include:
    - incremental changes in each of the above cost categories; and
    - membrane replacement.

Accordingly, it is proposed that the water availability charge that applies when the desalination plant is available but not producing water, in accordance with SDP's Network Operator Licence, should recover only the base level costs, or Availability Costs.

Under this tariff structure, costs for consumers are minimised because SDP is entitled to recover fixed costs at a level that is appropriate to its cost structure and the type of service it is providing at any point in time (i.e., availability to supply water or actual supply of water).

The water availability charge that would apply when SDP is not producing water is outlined in Table 6.2 and would be $579,500 per day in 2012-13 ($ 2010-11). No variable charges would be payable.

Table 6. 2 Proposed Availability and Variable Charges in shutdown ($ 2010-11)

	2012-13	2013-14	2014-15	2015-16	2016-17
Desalination plant not supplying water					
Availability charge 2 ($'000 / day)	579.5	573.5	569.1	560.7	553.8
Variable charge ($ / ML)	0.0	0.0	0.0	0.0	0.0

Shutdown Adjustments and Risk Sharing

The impact of a shutdown on the costs faced by SDP is in part predictable and these predictable changes in cost are reflected in the proposed availability charge. However, a shutdown also results in certain unavoidable but unpredictable changes in cost for SDP. These changes in cost arise not only during the period in which the plant is shut down, but also affect fixed operating costs in future periods after the plant is restarted. The major cost impacts are:

- fixed costs to transition the plant from operating status to shut-down;
- fixed costs to restart operations at the plant;
- electricity and renewable energy savings or costs;
- the deferring of membrane replacement and periodic maintenance costs; and
- the potential to achieve greater savings in other fixed operating costs (e.g., labour) than reflected in the availability charge.

Given the requirements of the Network Operator Licence, these changes in cost are unavoidable for SDP and may result in substantial savings or additional costs.

Due to the unpredictable nature of the potential occurrence and duration of a shutdown event and the consequent cost impacts, it is neither practical nor efficient to attempt to incorporate 'average costs' in the availability charge or to increase substantially the WACC to reflect these risks. Instead, it is proposed to provide a set of conditional adjusting payments that are activated only in the event of a shutdown. This will ensure that the community benefits from lower shutdown costs and that there is an appropriate level of risk for the investors in SDP. The proposed adjustments are outlined in Table 6.3 and detailed in Appendix 3.

Table 6.3 Shut-down Adjustment Payments

Shut-down Adjustment		($ 2010/11)	Description
Shutdown Charge Period of shutdown	< 2 years	$M per event	One-off payment, payable in the event of shutdown, reflecting the cost to cease operations at the plant for up to two years.
	>2 years	$M per event	Additional one-off payment, payable if a shutdown subsists for longer than 2 years, reflecting the additional cost to further reduce activity at the plant in the event of a prolonged shutdown.
Restart Charge Period of shutdown	< 2 years >2 years	$M per event $M per event	
Renewable Energy Standby Adjustment		$ variable	Annual adjustment payment, refer to 'Renewable Energy Standby Charge Adjustment' in Appendix.3.
Shutdown Savings Adjustment		$ variable	Annual adjustment payment, refer to 'Shutdown Savings Adjustment' in Appendix 3.

6.4 Additional retailers

As discussed in the Pricing Principles proposed by the Minister for Finance and Services for this determination, the desalination plant is a key element in Sydney's water security plan, and the plant is required to maximise water production when dam storage levels are below a prescribed threshold.

Consistent with these principles is the premise that any water retailer in the Sydney catchment area, including Sydney Water, should be required to support the desalination plant as a key water security measure undertaken for the Sydney catchment area. This includes requiring all water retailers to:

- purchase water produced by SDP equal to their percentage share of metropolitan demand (for the Sydney catchment area); or
- pay for the available capacity of the plant when the plant is running, and not running, equal to their percentage share of metropolitan demand.

Therefore it is proposed that water retailers pay for SDP's water charges in proportion to their share of metropolitan demand including their share of SDP's:

- availability charge both for water produced and for the potential to produce water when dam levels dictate that SDP is not required to produce water; and
- variable water supply charge for each ML of water produced.

Apart from setting the price determination for SDP, it is proposed that IPART play the following roles in administering allocation of payment for SDP's water charges between water retailers:

- when a new retailer applies for a Retail Supplier Licence:
    - IPART will require new retailers, as a condition of their Retail Supplier Licence, to sign up to a Water Supply Agreement (WSA) with SDP that is consistent with the water pricing principles and the WSA entered into with Sydney Water;
    - IPART will determine that retailer's share of metropolitan water demand and subsequently inform all retailers of their proportional share of water produced by SDP (or capacity of SDP) going forward (from the date the Retail Licence is approved);
- when IPART undertakes a price determination for a retailer, it will reassess all retailers' share of metropolitan water demand and inform SDP and all retailers of their proportional share of water produced by SDP (or capacity of SDP) going forward (from the date of the price determination); and
- when IPART issues a new retailer supplier licence for a retailer who will purchase bulk water from SDP, it should assess the credit quality of that retailer and determine a level of collateral to be posted by that retailer with SDP as credit support.

6.5 Abatement

The desalination plant is a key element in Sydney's water security plan. The plant is required to maximise water production when dam storage levels are below a prescribed threshold. It is critical that SDP has an appropriate incentive to meet this requirement (in addition to the incentive provided by the sanction that the licence could be revoked if SDP does not comply with its licence conditions). In order to provide an appropriate incentive it is proposed that IPART provides for an abatement regime as part of its pricing determination.

If the desalination plant is not available then as a matter of principle, there should be no availability charge. It is proposed that, in practice, 'available' would mean that the desalination plant meets the level of production that an efficient operator can achieve using industry standard operating practices and an efficient level of expenditure. This is likely to be around 95 per cent.

Consistent with this, the following structure of an abatement regime is proposed:

- At the end of each month, SDP may bill customers for the availability charge based on the average volume of water the desalination plant has produced and supplied to customers over the preceding 12 months, up to a maximum availability of 95%. That is, if the Plant maintains at least 95% availability on a 12 month rolling average basis, it will receive 100% of the availability charge. If availability falls below a rolling average of 95%, the availability charge will be abated proportionally.
- In the initial determination period, it would be assumed that the Plant had operated at 100% of nameplate capacity for the 12 months prior to the commencement of the determination period.
- In calculating the 12-month average, any days on which the plant was shut down under the Network Operators Licence would be excluded.
- If there is more than one customer, the above adjustments to customers' monthly bills will be made in proportion to each customer's share of the total volume supplied by SDP (as advised by IPART when it makes a price determination or when a new Retail Supplier Licence is issued).
- IPART may verify the adjustments made to the availability charge as part of each new price determination.

This structure would provide an appropriate financial incentive to operate the Plant so as to maximise the production of water, but acknowledges the practical challenges of maintaining operations at 100% of nameplate capacity in the long term.

Appendix 1 Efficiency of Expenditure

Key points

- SDP's operating expenditure is efficient. Most is incurred under contracts that were let through highly competitive tendering processes.
- SDP's contracts include a design, build, operate and maintain (DBOM) contract to build the desalination plant, and an Alliance contract for the design and construction of a drinking water pumping station and the pipeline from the desalination plant to Sydney Water's existing distribution network at Kurnell. This contracting strategy reflected the known risks for each element of the project at the design and construction stage. SDP also has contracts for the supply of electricity to the plant, and renewable energy certificates to offset the plant's electricity use.
- Procurement of the DBOM contract and energy for the plant both followed a competitive three-stage process, which involved calling for expressions of interest; a request for tender; and finally, evaluation, finalisation and contract execution. All stages were fiercely contested.
- Procurement of the distribution pipeline involved establishing an alliance partnership between Sydney Water and a private sector consortium. A partnership was entered into following a three-stage process, which involved a request for proposals; selection and commercial workshops; and final negotiations. The latter were robust and the total outturn cost and risk allocation debate continued for some time before agreement.

SDP's operating expenditure is considered to be efficient because it is mostly incurred under contracts that were let through a competitive tendering process. Most non-tendered costs (eg. council rates, land tax, bank fees) are set by third parties and therefore cannot be controlled by SDP. In order to illustrate the efficiency of expenditure by SDP on the desalination plant, this section outlines the reasons for choosing the contracting strategy adopted by SDP, and the process followed to enter into those contracts.

A1.1 Contracting Strategy

Design and construction of the plant and its associated assets was primarily delivered under two key contracts:

- a design, build, operate and maintain (DBOM) contract to build the desalination plant, including the seawater intake and seawater outlet connections, a reverse osmosis building, booster pumping stations, pre-treatment tanks and a drinking water tank. The DBOM procurement comprised a design and construct (D&C) contract and an operation and maintenance (O&M) contract; and
- A Water Delivery Alliance contract between Sydney Water and a contractor for the design and construction of a drinking water pumping station, and the 18 kilometre bulk water pipeline from the desalination plant to Sydney Water's existing distribution network at Kurnell. This work included tunnelling, micro-tunnelling, marine and above ground pipelines to the existing network at Erskineville, and associated mechanical and electrical systems.

The types of contract adopted for the procurement of the desalination plant and the bulk water pipeline were different given the different risks within the desalination project at the design and construction stage. At that stage, the degree of risk related to delivery of the plant was relatively well understood. The DBOM mechanism enabled SDP to transfer significant risks to the contractor (eg risks relating to process, performance, tunnelling and offshore works) while achieving a relatively certain price and delivery time schedule.

Figure A1.1 Jack-up barge used in constructing the seawater intake and outlet connections.

At the same time, there was more risk attached to delivery of the bulk water pipeline, including regarding the definition of its route through known contaminated land, connection points and community disruption. If a DBOM contract were used for the pipeline, the contractor's price would have included significant risk premiums to provide price and schedule delivery certainty. An alliance was selected to provide greater sharing of the risks involved in the design and construction of the water distribution infrastructure. That said, the risk allocation and total outturn cost decision was reached after a robust debate and design work changes that significantly reduced the total budget for construction of the bulk water pipeline.

SDP also entered into competitively bid contracts for the supply of electricity to the plant, and renewable energy certificates to offset the plant's electricity use. SDP also entered into a Project Deed for the construction of the Capital Wind Farm at Bungendore NSW, which dedicates its 'renewable energy certificates' (up to a specified limit) for sale to SDP.

A1.2 Procurement of the DBOM component

The DBOM procurement followed a competitive three-stage process. The stages were

1. Expressions of interest
2. Request for tender
3. Evaluation, finalisation and contract execution.

Sydney Water received four expressions of interest. The expressions of interest were evaluated against three mandatory criteria and two desirable criteria. The mandatory criteria were:

- Compliance with specified project and/or construction management capabilities;
- Financial strength and capacity; and
- The inclusion of at least one water company that had previously been shortlisted by Sydney Water.

The desirable criteria were:

- Demonstrated capabilities in specified areas to deliver the project's objectives, with a 70 per cent weighting overall; and
- The appropriateness of the respondents' proposed approaches to achieving these objectives, with a 30 per cent weighting.

Two proponents were short-listed to proceed to the request for tender stage. Two tenders were received, which were evaluated against three mandatory criteria and six desirable criteria. The mandatory criteria were:

- Compliance with specified project and/or construction management capabilities;
- Demonstrated capabilities to deliver the project within specified timeframes; and
- The inclusion of at least one water company that had previously been shortlisted by Sydney Water.

The desirable criteria were:

- The tendered whole-of-life costs, as assessed by Sydney Water (70 per cent weighting);
- The ability of the tenderers' proposals to meet or exceed specified technical, operational, maintenance, safety, community and environmental requirements (5 per cent weighting);
- The methods proposed for meeting the scheduled timeframes (10 per cent);
- Design and construction methodologies (5 per cent);
- Operation and maintenance methodologies (5 per cent); and
- Non-quantifiable legal and commercial factors (5 per cent).

Following this evaluation process, the BlueWater joint venture was announced as the preferred proponent. The principal members of this consortium were Veolia Water Australia – a subsidiary of Veolia Eau, which has participated in the design, construction and operation of what was at the time the world's largest desalination plant, in Israel – and the Australian construction company John Holland. The two principal contracts for the desalination plant were executed on 18 July 2007.

A1.3 Bulk water pipeline procurement

Procurement of the bulk water pipeline involved establishing a partnership between Sydney Water and a private sector consortium to develop the pipeline infrastructure. Sydney Water selected the most suitable consortium according to a three-stage process approved by the Board:

1. Request for Proposal;

2. Selection and commercial workshops; and

3. Final negotiations.

In response to the Request for Proposals, Sydney Water received Proposals from three consortia. The Proposals and the proponents were then evaluated, through reviews of the written Proposals and a series of interviews, discussions and workshops with the proponents' proposed team members. The Proposals and the proponents were evaluated against five mandatory criteria and three desirable criteria. The mandatory criteria were:

- Demonstrated capabilities in project and program management for complex projects, the designing of civil infrastructure such as water pipelines and pumping stations and construction management, including environmental management, health and safety management, community and stakeholder relations, workplace relations and incident management;
- Having had prime responsibilities for project and construction management on project(s) or program(s) of at least $100 million;
- Specified ISO quality and environmental management system certifications;
- Specified certifications and satisfactory performances in occupational health and safety management; and
- The financial strength and capacities of the proponents' project manager, construction manager and constructor(s) and their parent companies, and the financial capability of the proponents' groups as a whole to undertake a project of $500 million or more.

The 'desirable' criteria were:

- The proponents' demonstrated capabilities in specified areas to deliver the project's objectives, with a 40 per cent weighting overall;
- The appropriateness of the proponents' proposed approaches to achieving these objectives, with a 30 per cent weighting overall; and
- The proponents' and their nominated team members' personal demonstrated experience in, understanding of and affinity for working in alliances or other collaborative arrangements, with a 30 per cent weighting overall.

On 6 June 2007, Sydney Water entered into an alliance agreement with Connect Alliance – consisting of Bovis Lend Lease, McConnell Dowell, Kellogg Brown & Root, Patterson Britton and Partners and Environmental Resource Management.

Negotiation of the risk allocation and total outturn cost with the preferred proponent was a robust and lengthy process. This debate led to design work changes that significantly reduced the initially proposed total outturn cost for construction of the bulk water pipeline. Some further modest savings were also made during delivery of the pipeline, indicating the efficiency of expenditure under the Alliance arrangement.

A1.4 Selection of renewable energy certificate and electricity suppliers

Procurement of energy for the desalination plant followed a competitive three-stage process. The stages were

1. Request for Proposal;

2. Request for Tender; and

3. Evaluation, finalisation and contract execution.

Requests for Proposals for the supply of renewable energy for the desalination plant were called for in October 2007. Responses were received from 13 groups, comprising both energy retailers and renewable energy project developers. These Proposals were evaluated against three mandatory criteria and three 'desirable' criteria. The mandatory criteria were:

- Adequate financial strength and capacity;
- The ability to supply renewable energy from September 2009; and
- The potential to obtain the licences required for the supply of the renewable energy.

The ‘desirable’ criteria were:

- Assessed costs, based on the proponents’ indicative prices for electricity and renewable energy certificates but with adjustments for risks (70 per cent weighting);
- The extent to which the proponents’ renewable energy would be generated by a clearly identifiable and sustainable source (20 per cent weighting); and
- The extent to which the renewable energy source would be available by the end of 2009 (10 per cent weighting).

Six of the proponents were shortlisted to tender for the renewable energy contracts. A Request for Tender was issued to each these shortlisted proponents. Four tenders were received by the closing date and were evaluated against three mandatory criteria, which were:

- Adequate financial strength and capacity;
- The potential to obtain the licences required for the supply of the renewable energy; and
- The generation of the renewable energy by a clearly identifiable renewable generating source.

The tenders were also evaluated against and three ‘desirable’ criteria:

- Assessed costs, based on the tenderers’ prices for electricity and renewable energy certificates but with adjustments for risks (80 per cent weighting);
- The extent to which the proponents’ renewable generating source would be available in a reasonable timeframe (10 per cent weighting); and
- The acceptability to Sydney Water of the tenderers’ proposed commercial conditions (10 per cent weighting).

The preferred tenderer was announced on 13 May 2008 and six of the seven original contracts for the project were executed on 28 July 2008. Execution of the seventh was completed on 29 July 2008.

The energy contracts represent good value for money for SDP as they include fixed real prices for a 20-year term, with no pass through of future carbon costs. The contracts also provide flexibility to nominate annual REC volumes to match the planned operating profile of the Plant, and the ability to sell electricity and RECs back to the market if demand for desalinated water is lower than forecast.

Appendix 2 SDP Historical Expenditure

Key points

- SDP's actual operating costs for 2009-10 to 2011-12 generally match the amounts forecast for SDP at the time of the 2008 Sydney Water price determination. Variations between actual and forecast costs can be explained by: a later than expected handover of the plant; inclusion of renewable energy costs; and lower than expected volumes of desalinated water in 2009-10 and 2010-11 as a result of the later than expected handover of the plant and a shutdown to accommodate work by AusGrid.
- The capital cost of the desalination plant was slightly lower than forecast at the 2008 Sydney Water price determination as a result of $7.5 million in savings arising from lower than expected expenditure on communication initiatives and safety and time incentive payments. The savings were partially offset by $3.2 million in variations and change orders.
- The capital cost of the distribution pipeline and the water pumping station was about $21 million less than forecast. This included around $62 million in unused contingency and escalation allowances, and a saving of around $6 million on the cost of delivering the drinking water pumping station. These savings were partially offset by a $11.6 million increase in the cost of the Botany Bay pipeline; $9.4 million in additional costs for the land-based pipeline; and $26 million in savings retained by the private sector partners.

A2.1 Operating expenses for 2008-09 to 2011-12

Operating expense targets for SDP, which were included in the 2008 price determination for Sydney Water, are set out in Table A2.1 below. Overall, the 2008 determination provided for total operating costs of $148 million between 2009-10 and 2011-12.

Table A2.1 also includes actual operating expenses for the period 2009-10 to 2010-11 and budgeted costs for 2011-12. At present, it is anticipated that actual operating expenses for the 2009-10 to 2011-12 will total $146 million.

The main reasons for the difference between actual costs and the determined amounts are timing and the inclusion of renewable energy costs.

Table A2.1 SDP Operating Expenses 2009-10 to 2011-12 ($ Million, Nominal)

	2009-10	2010-11	2011-12	Total
2008 Determination	29.3	58.3	60.3	147.9
Actual / Forecast	2.8	66.4	76.9	146.1
Variance	**26.5**	**-8.1**	**-16.6**	**1.8**

Actual operating expenses for 2009-10 were only $3 million, compared to $29 million expected at the time of the last IPART price determination for Sydney Water. This difference occurred as a result of a later than expected handover of the desalination plant. While the desalination plant commenced producing water in January 2010, as originally anticipated, the full handover of the plant was later than expected. Before full handover of the plant, operating costs were capitalised to the project, consistent with accounting standards.

The difference between forecast and actual/budgeted costs in 2010-11 and 2011-12 was primarily due to renewable energy costs. These costs are about $19 million per year. At the time of Sydney Water's submission to the 2008 price determination, energy contracts were still being negotiated. Sydney Water had selected the preferred tenderer by the time of the final Determination but

advised IPART that it would absorb the difference between projected and actual renewable energy costs for the term of the 2008 price determination.

Figure A2.1 Capital Wind Farm

In 2010-11, some of the increase in operating costs, compared to forecasts, was offset by a reduction in costs attributable to lower than expected volumes of desalinated water produced. Actual production was lower than expected in 2010-11 primarily due to a plant shutdown from 8 September 2010 to 19 October 2010. This shutdown was required a result of AusGrid building a new electricity sub-station at Kurnell.

Volumes expected to be produced at the time of the 2008 Sydney Water price determination and actual/forecast volumes are set out in Table A2.2. These costs were based on an assumption that the desalination plant would operate at full capacity from January 2010 til June 2012. This included a six-month period for testing and commissioning, which commenced in January 2010, followed by a two-year proving period.

Actual production was also lower than expected in 2009-10 due to a delay in completion and hand-over of module 2 of the plant until mid-June 2010.

Table A2.2 SDP desalinated water production 2009-10 to 2011-12 (GL)

	2009-10	2010-11	2011-12
2008 determination	45.63	91.25	91.25
Actual/Forecast	20.07	76.7	90.00

A2.2 Capital - Performance between 2007-08 and 2010-11

Production of desalinated water commenced, on target, in January 2010. Following the initial testing phase, the plant was officially handed over to SDP on 15 June 2010.

Some savings were made in the delivery of the plant, which was ultimately completed on time and under budget. The tendered costs and the final costs for the desalination project are presented in Table A2.3. The actual capital cost for the total project, including the cost of the DBOM contract for the plant and intake and outfall infrastructure, the Alliance costs for the pumping station and bulk water pipeline, and project development costs, was $1,801.5 million. This was around $94.5 million, or around five per cent, lower than the budgeted cost.

Table A2.3 Project Delivery – Total Capital Costs ($ Nominal, $M)

	Tendered/Total Outturn Costs	Actual/Forecast Costs
DBOM (plant, intake & outlet infrastructure)	1,006.0	1,000.0
Alliance (bulk water pipeline and pumping station)		
Land Based Bulk Water Pipeline	352.1	343.6
Botany Bay Bulk Water Pipeline	248.3	248.8
Pumping Station	49.6	39.9
Project Development Costs*		
DBOM	173.5	131.1
Bulk Water Pipeline**	66.5	36.7
Pumping Station		1.5
Total	**1,896.0**	**1,801.5**

* The project development costs in this table are calculated on a different basis to those in table A2.4, which contains capital costs calculated for regulated price-setting purposes (ie. accounting adjustments have been removed and the non-depreciating component has been separated out).
** The project development costs for total outturn purposes were not disaggregated between the bulk water pipeline and the pumping station

Table A2.4 compares the annual capital expenditure on the desalination plant and related infrastructure to the total annual capital expenditure forecast for the desalination project at the 2008 Sydney Water price determination.

Table A2.4 SDP Capital Expenditure ($ Nominal, $'000)

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12*	Total
Actuals								
SDP								
Plant	0	0	299,739	355,420	92,368	658	0	748,186
Intake Infrastructure	0	0	106,437	74,343	4,952	0	0	185,733
Outlet Infrastructure	0	0	37,733	17,927	1,073	0	0	56,733
Pumping Station	287	223	7,901	23,197	8,862	557	351	41,378
Pre-operations Payment**	0	0	1,231	4,511	3,457	0	0	9,199
Project Development	30,306	19,798	25,541	13,318	10,839	1,639	547	101,988
Non-Dep for SDP	39,568	5,228	17,473	62	187	12	5	62,535
Bulk Water Pipeline								
Pipeline	0	0	108,725	334,592	142,430	1,542	5,240	592,528
Project Development	5,626	4,363	3,423	6,259	3,832	166	0	23,670
Non-Dep for Pipeline	0	0	0	719	103	873	11,330	13,025
Total	**75,787**	**29,612**	**608,203**	**830,348**	**268,103**	**5,448**	**17,473**	**1,834,973**
Forecasts Submitted to IPART for 2008 Price Review								
SDP		100,514	488,691	517,857	151,006			1,258,068
Distribution Pipeline		17,773	193,467	296,885	179,377			687,502
Total		**118,287**	**682,158**	**814,742**	**330,383**			**1,945,570**
Difference	**75,787**	**-88,675**	**-73,955**	**15,606**	**-62,280**	**5,448**	**17,473**	**-110,597**

* 2011-12 values have been estimated with a CPI forecast of 3%.
** These were included in the DBOM costs.

For the DBOM component of the project, actual costs were lower than the amount forecast at the 2008 Sydney Water price determination. Savings made during delivery of the projected included

$1.5 million that had been set aside for communication initiatives; and $6 million (out of a total of $16 million) that had been set aside for safety and time incentive payments.

These savings were offset by a total of $3.2 million in variations and change orders, including:

- $0.1 million for additional SDP office space on site (to enable better contract oversight);
- around $1 million for management of the interface between the DBOM and Alliance projects;
- $1.8 million to design and install a conduit for a second 132 kV feeder;
- $60,000 for additional security measures (fencing and CCTV); and
- $0.2 million for the design of an back-up powdered fluoride dosing system.

The extremely low level of variations reflect the performance based nature of the DBOM contract, which allowed BlueWater to optimise design and make changes without requiring significant variations to the contract.

For the Alliance component of the project, net savings of around $21 million were made. This included around $62 million in unused contingency and escalation allowances, and a $6 million saving in the cost of the drinking water pumping station. These savings were partially offset by:

- a $11.6 million increase in the cost of the Botany Bay section of the bulk water pipeline due to revisions in the design and construction method;
- $9.4 million in additional costs for the land-based section of the pipeline, mainly due to the time and cost of the micro-tunnelling technique used on some sections of the pipeline; and
- an additional $26 million in Alliance margin and cost savings retained by the Alliance partners.

Table A2.5 converts the values in Table A2.4 to real values in $ 2010-11 order to calculate the regulatory interest during construction (IDC) incurred on the capital costs for the desalination plant, and also opening asset values for the RAB. Regulatory IDC is the opportunity cost of spending money for which recovery will not commence until some time after it has been spent. The estimates have been calculated using monthly expenditure profiles. As IPART incorporated the SDP costs into water prices from 1 July 2009, IDC has only been calculated up to that point in time. IDC estimates are added to the total capital costs and recovered through prices.

Table A2.5 SDP Capital Expenditure and Interest During Construction (IDC) ($ 2010-11, $'000)

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	Total
SDP								
Plant	0	0	321,525	369,969	94,492	658	0	786,644
Intake Infrastructure	0	0	114,066	77,326	5,066	0	0	196,459
Outlet Infrastructure	0	0	40,383	18,784	1,098	0	0	60,265
Pumping Station	327	246	8,481	24,085	9,066	557	341	43,103
Pre-operations Payment	0	0	1,319	4,676	3,536	0	0	9,531
Project Development	34,481	21,855	27,446	13,851	11,089	1,639	531	110,892
Non-Dep Asset (Land)	45,175	5,725	18,741	63	192	12	5	69,912
Total	79,983	27,826	531,960	508,756	124,538	2,866	877	1,276,806
SDP Regulatory IDC	2,946	6,949	28,365	72,042	0	0	0	110,301
Bulk Water Pipeline								
Pipeline	0	0	118,572	352,898	145,706	1,542	5,109	623,827
Project Development	6,515	4,896	3,733	6,602	3,920	166	0	25,833
Non-Dep for Pipeline	0	0	0	758	105	873	11,047	12,783
Total	6,515	4,896	122,305	360,258	149,731	2,582	16,155	662,443
Total	**89,445**	**39,671**	**682,630**	**941,055**	**274,269**	**5,448**	**17,032**	**2,049,550**

Appendix 3 Price Adjustment Mechanisms

Renewable Energy Standby Adjustment

SDP faces potential gains or losses as a result of the on-selling of surplus electricity or RECs in the event that the plant is shut down. An estimate of these costs is incorporated in the availability charge on the basis of projected electricity and REC market prices over the determination period. The variable charge is set to recover only the incremental cost to SDP of using rather than on-selling the electricity and RECs.

If the plant operates for the determination period, these estimates have no impact on the costs faced or revenues earned by SDP. However, if a shutdown occurs, SDP may achieve better or worse than forecast proceeds from on-selling. These amounts are readily identifiable under the terms of the contracts for the supply of electricity and RECs to SDP and on-selling occurs on arms-length terms (in the case of electricity, at the prevailing market price in the National Electricity Market).

The Renewable Energy Standby Adjustment provides an annual settlement mechanism that is applied only in the event that a shutdown occurs under the Network Operators Licence. The adjustment has the effect of replacing the market price estimates included in the availability charge with actual market prices during the period of a shut-down. In the absence of a shut-down, no adjustment applies.

Box A3.1 outlines how the Renewable Energy Standby Adjustment operates.

Box A3.1 Renewable Energy Standby Adjustment

$$RESA_x = \sum_{t=0}^{t=n} \{(EEP - AEP)\, x\, ESV + (ERP - ARP)\, x\, RSV\}$$

Where:

$RESA_x$	=	the Renewable Energy Standby Adjustment for calendar year x.
t=0	=	the first period in which a shut-down of the plant subsists under the Network Operators Licence in calendar year x.
t=n	=	the last period in which a shut-down subsists under the Network Operators Licence in calendar year x.
EEP	=	the estimated market price (in $/MWh) for electricity included in the availability charge in calendar year x. In the 2012-2017 determination period, this value is [$40/MWh], expressed in 2010/11 terms.
AEP	=	the actual price (in $/MWh) achieved for on-selling of surplus electricity the time period.
ESV	=	the volume of electricity (in MWh) on-sold during the time period as a result of the shut-down event.
ERP	=	the estimated market price (in $/REC) for renewable energy certificates included in the availability charge. In the 2012-2017 determination period, this value is [$40/REC], expressed in 2010/11 terms.
ARP	=	the actual price achieved (in $/REC) for on-selling of surplus renewable energy certificates in a time period.
RSV	=	the volume of renewable energy certificates on-sold during a time period as a result of the shut-down event.

Shutdown Savings Adjustment

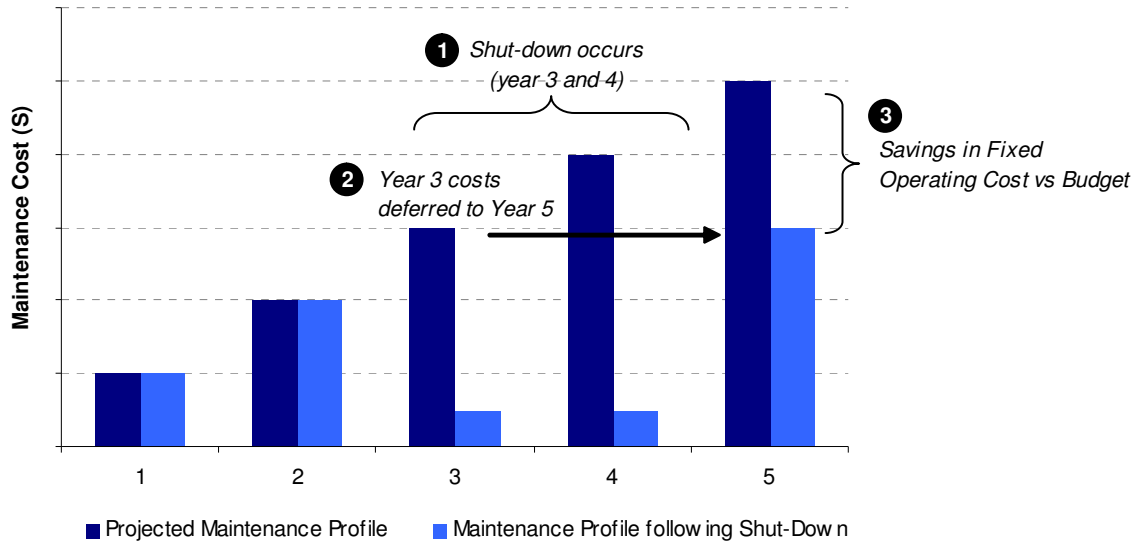
A shutdown presents SDP with the opportunity to realise savings in fixed operating costs beyond those incorporated in availability charge but also results in the potential for additional fixed and variable operating costs once the plant recommences operations. The potential changes in SDP's cost are a significant risk to SDP. Some of this risk should be shared with SDP's customers so they pay the actual cost of supplying water and so they benefit from reductions in costs. For example, customers should benefit from a reduction in costs that would occur if the plant can be placed in

shutdown for an extended period of time (greater than 2 years) in the event that dams reach unusually high levels.

A risk sharing mechanism is, therefore, proposed to ensure that SDP's actual revenue is not significantly different from the level SDP requires to recover its actual costs. Significant variations between actual revenue and forecast costs will generally arise if the plant is shut down for longer than expected or when a shutdown and restart occurs within a determination period.

In the latter case, it is likely that SDP will realise significant savings in fixed operating costs following a restart. In general, maintenance costs increase over time and this is particularly true in this determination period because maintenance costs are ramping-up towards long-term levels. Consequently, due to the deferring of maintenance costs during a shut-down, when the plant restarts, SDP will face lower maintenance costs compared to those that are built into the availability charge (i.e., relatively high projected fixed operating costs in later years would be substituted by relatively low actual fixed operating costs as a consequence of a shut-down). Figure A3.1 illustrates the concept.

Figure A3.1 Maintenance Cost Impact of a Shut-down



The occurrence, timing and duration of shut-down events is inherently unpredictable, therefore a risk sharing mechanism is proposed to address this issue. Such a mechanism is consistent with the Pricing Principle set by the Minister for Finance and Services, which states that SDP's prices should encourage it to be financially indifferent to whether or not the desalination plant operates.

The risk sharing mechanism would apply only in the event that a shut-down occurs under the Network Operator Licence and the mechanism would adjust SDP's prices if the difference between actual operating costs and the revenue received to cover those costs (ie. total revenue minus the regulated amount for return on assets, depreciation and return on working capital) exceeds ± 2 per cent of actual revenue.

That is, there would be a 2 per cent collar on the difference between actual operating costs and the revenue for operating costs (as a proportion of actual revenue for operating costs). The risk-sharing adjustment would occur at the end of each year during the determination period, but only in the event that a shutdown occurs (ie. from the date the plant is shutdown under the Network Operator Licence until the end of the determination period).

Box A3.2 outlines how the shutdown savings adjustment would work.

Box A3.2 SDP Shutdown Savings Adjustment

If: $\frac{\text{Actual Opex (year a)} - \text{Opex Revenue (year a)}}{\text{Opex Revenue (year a)}} > \pm 2 \text{ percent}$

Where: Opex Revenue (year a) = Total regulated revenue (year a) *less* Regulated Return on Assets, Regulated Depreciation and Regulated Return on Working Capital (year a)

Actual Opex (year a) = Total actual operating costs (year a)

Then: Shut-down Savings Adjustment (year a) = (Actual Opex (year a) – Opex Revenue (year a)) – (2% x Opex Revenue x Sign)

Where:

Sign = 1 if (Actual Opex (year a) – Opex Revenue (year a)) >0
-1 if (Actual Opex (year a) – Opex Revenue (year a)) <0

Note that the Shutdown Savings Adjustment applies to all costs and revenue occurring after a shut-down, including the proposed Shutdown Charge, Restart Charge and Renewable Energy Standby Adjustment. The Shutdown Savings Adjustment does not need to exclude the costs of energy or shutdown or restart charges because any additional costs or savings for these items will be cancelled out by their associated adjustments (ie. before the Shutdown Savings Adjustment is calculated). Further, the proposed Restart Charge adjustment includes the estimated cost of additional electricity required while the desalination plant is restarted, to the extent that there is a difference between the actual and estimated cost of this additional electricity, the Shutdown Savings Adjustment will correct this.

Appendix 4 SDP Risks

Risk Category	Impact
Asset	
Risk that asset replacement and maintenance requirements are higher (due to greater number of defects, higher rate of deterioration, low durability, design failure, poor construction quality, etc…) than anticipated and not resolved by the Operator.	Disruption to supply
Risk of warranty disputes and that warranties are not honoured, e.g. because the operator or a third party voids the warranty provisions.	Cost
Risk that a significant component or all of the Marine Works, Plant, Pumping Station, or Bulk Water Pipeline breaks down.	Cost / disruption to supply
Risk that the technology becomes outdated and inefficient, for example that technological improvements occur which cannot be easily or cheaply incorporated within the plant's existing design.	Cost
Risk of technical obsolescence or innovation, which results in replacement equipment becoming unavailable requiring a redesign of the plant.	Cost / disruption to supply
Marine pipelines	
Risk that sediment, chemical deposition, kelp and growth may build up in the intake/outfall tunnel resulting in reduction of water flow and / or less than optimal performance which is not resolved by the Operator.	Cost / disruption to supply
Risk that accidental damage or event may occur affecting intake or outtake – e.g. a vessel or anchor comes into contact with intake or outtake.	Cost / disruption to supply
Bulk water pipeline	
Risk that the pipeline is damaged (including sections that are under water or underground and therefore unobservable).	Cost / disruption to supply
Risk that maintenance takes longer or costs more than anticipated.	Cost / disruption to supply
Risk that cathodic protection of the pipeline is not maintained.	Cost / disruption to supply
Risk of a security breach.	Cost / disruption to supply
Risk that poor maintenance leads to water quality problems.	Cost / disruption to supply
Risk that concrete and other materials in contact with groundwater experience accelerated deterioration.	Cost / disruption to supply
Membranes	
Risk that SDP is subject to membrane price increases that are beyond those forecast and allowed for in the current determination period.	Cost
Risk that the membrane manufacturer / industry experiences a major interruption and cannot supply goods.	Cost / disruption to supply
Risk that the type of membranes required are no longer available and that this results in refurbishment costs not forecasted.	Cost / disruption to supply

Risk Category	Impact
Energy	
Risk that energy usage differs from forecast and SDP is subject to the differential between the market price and contract price for energy.	Cost
Risk that REC usage is below the minimum purchase requirements for RECs or differs from forecast and SDP is subject to the differential between the market price and contract price for RECs.	Cost
Risk of power interruption, failure of the transmission line to the site, or unavailability / insufficient system wide power capacity.	Cost / disruption to supply
Risk the REC scheme is discontinued, limiting ability to sell unwanted RECs.	Cost
Chemicals	
Risk that SDP is subject to chemical price increases that are beyond those forecast and allowed for in the current determination period.	Cost
Risk that a specialist chemical supplier experiences a major interruption and cannot supply the required chemical/s.	Cost / disruption to supply
Risk that the type of chemicals required are no longer available and that this results in refurbishment costs not forecasted.	Cost / disruption to supply
Labour	
Risk that SDP is subject to other labour increases that are beyond those forecasted and allowed for in the current determination period.	Cost
Risk that SDP is subject to industrial action that disrupts its ability to supply desalinated water.	Cost / disruption to supply
Risk that the operator is not able to source or train sufficient staff with the appropriate skill set to operate the plant over the operating term.	Cost / disruption to supply
Environment	
Risk that during the operation there is damage to property / environment due to marine pipeline failure.	Cost / disruption to supply
Risk that during the operation there is damage to property / environment due to chemical leakage on the Site.	Cost / disruption to supply
Risk that environmental licence/regulations, requirements change and lead to significant additional processing costs (e.g. change in waste disposal requirements etc).	Cost
Safety	
Risk that during the operation there is a major safety incident interrupting the ability of the plant to operate.	Cost / disruption to supply
Shutdowns	
Risk that more shutdowns are required than forecast within a price path.	Cost
Risk that the plant takes longer to restart than anticipated which restricts the plant's capacity to produce water when required.	Cost / disruption to supply
Risk that SDP begins the process of restarting the plant too late following a decrease in dam capacity, i.e. does not correctly predict the rate of decrease of dam capacity.	Disruption to supply
Risk that following a long term shutdown or mothball of the plant SDP is not able to recommission the plant without major refurbishment.	Cost / disruption to supply
Risk that following a mothball of the plant SDP is not able to source trained operators (that had been retrenched/removed from the plant during a shutdown).	Cost / disruption to supply

Risk Category	Impact
Seawater	
Risk that raw seawater quality adversely changes (i.e. moves outside initial specified range) increasing energy use, chemical cost, and potentially resulting in inability for the existing plant (design) to treat seawater.	Cost / disruption to supply
Drinking Water	
Risk that drinking water requirements change (i.e. moves outside initial specified range) increasing energy use, chemical cost, and potentially resulting in inability for the existing plant (design) to meet the new drinking water requirements.	Cost / disruption to supply
Operator	
Operator error – risk that the operator makes an error which results in the plant not operating efficiently	Cost / disruption to supply
Operator error – risk that the operator makes an error which results in discharging out of specification wastewater	Cost / disruption to supply
Operator error – risk that the operator makes an error which results in discharging out of specification desalinated water	Cost / disruption to supply
Risk the operator becomes insolvent, or abandons the project.	Cost / disruption to supply
Risk the operations contract is terminated early due to operator failure to meet their obligations and there is a delay in finding a replacement operator or that a new operator significantly increases the costs of operations.	Cost / disruption to supply
Operator/ Sydney Water	
Risk that key operational interfaces (operating protocols between the operator and Sydney Water) are not managed properly	Cost / disruption to supply
Risk that water is not appropriately tested and poor quality water gets into the transfer pipeline (and into the drinking water supply) resulting in consumer health effects, industry costs, and loss of confidence in the desalination project.	Cost / disruption to supply
Other	
Risk there is a security breach, and/or the project is sabotaged or vandalised.	Cost / disruption to supply
Risk insurance premiums increase beyond forecast and/or the forecast level of insurance or type of cover is no longer available.	Cost
Risk specific taxes are imposed that are not included in the forecast.	Cost
Risk of force majeure events.	Cost / disruption to supply
Risk of significant change to the asset or desalination process due to political considerations and community protest	Cost / disruption to supply

Appendix 5 SDP Financial Statements

Sydney Desalination Plant Pty Limited Profit & Loss ($M Nominal)

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue - Fixed	152.9	210.3	227.2	233.6	239.6	241.5	241.7
Revenue - Variable	46.8	60.1	50.4	53.6	56.5	58.7	61.0
Total Revenue	**199.7**	**270.4**	**277.6**	**287.2**	**296.1**	**300.2**	**302.7**
Contractors - Veolia O&M - Plant	26.8	29.6	31.3	35.9	39.6	40.2	39.2
Contractors - Veolia O&M - Pumping Station	0.6	0.7	0.7	0.8	0.8	0.8	0.9
Contractors Veolia O&M - Incentive		0.1					
Contractors - Marine monitoring program	0.7	0.9	0.8	0.3			
Sub-total Contractors	**28.1**	**31.3**	**32.8**	**37.0**	**40.4**	**41.0**	**40.1**
Auditor Generals Fees		0.1	0.1	0.1	0.1	0.1	0.1
Sub-total Admistration Expenses		**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Council Rates & Charges	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Land Tax	0.6	0.6	0.6	0.6	0.6	0.7	0.7
Sub-Total Property Costs	**1.0**	**1.1**	**1.1**	**1.1**	**1.1**	**1.2**	**1.2**
Electricity External	21.3	24.2	26.2	28.2	30.4	31.6	32.5
Green Trading Certificates Exp/usage	14.2	18.3	19.8	21.3	22.7	23.2	23.8
Total Energy	**35.5**	**42.5**	**46.0**	**49.5**	**53.1**	**54.8**	**56.3**
Total Purchases by Subsidiaries from SWC	**1.8**	**2.0**	**2.1**	**2.2**	**2.2**	**2.4**	**2.7**
OPERATING EXPENDITURE	**66.4**	**77.0**	**82.1**	**89.9**	**96.9**	**99.5**	**100.4**
Devaluation Excess RECS	1.3						
Borrowing Costs	90.6	140.6	139.6	134.4	126.4	118.1	112.1
Depreciation	29.3	37.9	38.1	38.8	40.2	42.1	43.6
PROFIT BEFORE TAX	**12.1**	**14.9**	**17.8**	**24.1**	**32.6**	**40.5**	**46.6**
Income Tax	3.6	4.5	5.4	7.3	9.8	12.1	14.0
PROFIT AFTER TAX	**8.5**	**10.4**	**12.4**	**16.8**	**22.8**	**28.4**	**32.6**

Sydney Desalination Plant Pty Limited Balance Sheet ($M Nominal)

As at June 30	2011	2012	2013	2014	2015	2016	2017
Cash	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Trade and other receivables	19.3	25.0	25.7	26.7	27.6	28.1	28.4
Renewable energy certificates	6.2	6.2	6.2	6.2	6.2	6.2	6.2
CURRENT ASSETS:	**25.6**	**31.2**	**31.9**	**32.9**	**33.9**	**34.3**	**34.7**
Plant, property and equipment	1,282.1	2,000.1	2,012.2	2,022.4	2,030.1	2,037.2	2,045.7
Intangible assets	0.2	0.2	0.2	0.2	0.2	0.2	0.2
NON-CURRENT ASSETS*:	**1,282.3**	**2,000.3**	**2,012.4**	**2,022.6**	**2,030.3**	**2,037.4**	**2,045.9**
TOTAL ASSETS	**1,307.9**	**2,031.5**	**2,044.4**	**2,055.5**	**2,064.2**	**2,071.7**	**2,080.6**
Trade and other payables	58.8	77.4	74.9	70.3	66.7	62.7	61.4
Dividend provision	-	-	-	-	-	-	-
CURRENT LIABILITIES:	**58.8**	**77.4**	**74.9**	**70.3**	**66.7**	**62.7**	**61.4**
Borrowings	1,089.4	1,732.3	1,682.1	1,625.9	1,557.8	1,480.8	1,396.0
Deferred Tax liability	38.0	51.3	64.7	78.1	91.6	105.2	118.8
NON-CURRENT LIABILITIES:	**1,127.4**	**1,783.6**	**1,746.8**	**1,704.0**	**1,649.4**	**1,585.9**	**1,514.7**
TOTAL LIABILITIES	**1,186.2**	**1,861.0**	**1,821.7**	**1,774.3**	**1,716.1**	**1,648.6**	**1,576.1**
NET ASSETS	**121.7**	**170.5**	**222.7**	**281.2**	**348.1**	**423.1**	**504.5**
Paid up share capital	127.3	127.3	127.3	127.3	127.3	127.3	127.3
Asset Revaluation Reserve	16.3	49.3	82.6	115.9	149.4	183.1	216.9
Other Contributed Equity	(28.1)	(22.7)	(16.5)	(8.3)	2.3	15.4	30.2
TOTAL CAPITAL RESOURCES	**115.5**	**153.9**	**193.5**	**235.0**	**279.1**	**325.8**	**374.5**

*The non-current assets in the Balance Sheet increase at 30 June 2012 because the bulk water pipeline and easements ($708 nominal) are transferred into SDP during 2011-12 along with a corresponding increase in debt.

Appendix 6 The Desalination Plant and the Metropolitan Water Plan

Key points

- Construction of a desalination plant for Sydney is one of a variety of measures to secure Sydney's water supply under the Metropolitan Water Plan.
- The 2006 Metropolitan Water Plan included a decision to build the desalination plant when dams were at "around 30 per cent" of storage capacity. This trigger was designed to ensure the plant would be operational when storages required and in the knowledge that it would take about two years to build. The 2006 Plan also stated this trigger could be "adaptively modified over time".
- A decision to construct the desalination plant was made when dams were at 34 per cent. The decision was made in light of rapidly depleting dam storages and new information that construction of the plant would take longer than originally anticipated.
- The 2010 Metropolitan Water Plan established the Operating Rules for the desalination plant. The Rules were developed after cost benefit analysis and provide that the plant is to operates at its full production capacity when the total dam storage level is below 70 per cent. The plant will continue operating until the dam storage level reaches 80 per cent.
- The desalination plant Operating Rules strike the right balance between the cost of operating the plant and the benefits of producing the maximum amount of water.

A6.1 The decision to build the Desalination Plant

Since 2004 an adaptive management framework, the Metropolitan Water Plan, has guided urban water policy in NSW. Under the Metropolitan Water Plan framework, the desalination plant was one part of a multifaceted approach to securing the water supply, which also included recycled water schemes, investment in fixing leaking pipes, and a suite of water efficiency measures.

The measures contained in the Plan were chosen using a portfolio approach. This involved analysing different combinations of existing and new water supply and demand measures to identify the optimum mix of options that provides water security at the least cost. This analysis took account of a range of factors, including the volume of water supplied or saved by each option, the cost of each option and the reliability of the outcome for each option.

Planning for a potential desalination plant for Sydney was put in place from the first Plan in 2004. The policy framework around implementation of the plant was managed through the subsequent progress reports and updated Plans, most notably the 2006 Plan.

The 2006 Plan, included a desalination construction trigger of "around 30 per cent" of storage capacity. The 2006 Plan states this trigger could also be "adaptively modified over time".

As storage levels continued to deplete throughout 2006, at a rate of around two per cent per month, it became clear that without further rain there was a risk that a desalination plant would not be ready when required. It was by that time known that the plant would take over two years to build.

A number of alternative large-scale supply options were also considered. Of all the alternatives, however, desalination was the least cost and most reliable large-scale supply option. It was also the option that could be delivered more quickly than any other.

The decision to commit to the construction of the desalination plant therefore represented a balanced outcome given the continued learning from the 2004 and 2006 Plans, and the necessity to secure Sydney's water supply in the face of continuing drought.

Despite the end of the recent extreme drought conditions and investment in measures such as desalination, recycling and water efficiency – severe and extreme drought conditions can re-emerge quickly in Sydney. As seen in the period between 2004 and 2006, dam levels can and do deplete rapidly – during the summer of 2006-07, dam depletion was between 0.4 and 0.6 per cent per week.

As such, the adaptive, Metropolitan Water Plan framework remains in place to safeguard the water supply into the future, with an updated Plan being released in 2010.

A6.2 Desalination Plant Operating Rules

Under the Operating Rules established by the Metropolitan Water Plant, the desalination plant operates at full production capacity when the total dam storage level is below 70 per cent. The plant will continue operating until the dam storage level reaches 80 per cent.

Most desalination plants in the world operate at full capacity all the time. Because of the extreme variability of rain in Sydney's catchments, this desalination plant has the flexibility to shut down or to operate at less than full capacity. This was a feature of its design and construction. This allows the desalination plant to be switched off at 80 per cent dam storage.

The desalination plant can produce about 15 per cent of Sydney and the Illawarra's current drinking water needs. While the plant is one of the largest in the world, it is not large enough to operate effectively only as an emergency drought measure. For instance if it produced water only when dams levels fell to 40 per cent in a drought, it would not produce enough water to stop dam levels falling further and avoid the need to introduce severe water restrictions or other extreme drought measures.

Rather, the plant can be very effective in maintaining storage levels if it produces water when dam storages are still relatively high. This allows the plant to generate a buffer of water in the dams that can be used during dry periods. The likelihood of water restrictions can be reduced, more water is available to maintain the health of the Hawkesbury-Nepean river through environmental flows, and the likelihood of costs to further augment the water supply are reduced. Note that new environmental flow releases from Warragamba Dam are due to begin from 2018.

Operating the plant at full capacity in line with the '70/80 per cent' rule in the Metropolitan Water Plan strikes the right balance between the cost of operating the plant and the benefits of producing the maximum amount of water.

Appendix 7 Interim and proposed charges

Sydney Water's website contains SDP's interim charges for when the desalination plant is operating. Table A7.1 sets out this submission's proposed charges for SDP, for comparison.

The main reason for the change in the fixed charge is the inclusion of the costs of the bulk water pipeline.

Table A7.1 SDP's interim and proposed charges ($ 2010-11)

SDP's interim charges	Proposed SDP charges
Usage charge = $0.62 per kilolitre	Usage charge = $0.53 per kilolitre
This charge recovers all of SDP's variable costs. This includes variable costs under the O&M contract and costs of electricity and Renewable Energy Certificates (RECs).	This charge recovers all of SDP's variable costs. It is lower than the interim charge because of a variation in the treatment of RECs and electricity.
Availability Charge = $12.7 million per month	Availability charge = $18.01 million per month
This charge recovers all of SDP's fixed capital and operating costs *excluding* pipeline costs.	This charge recovers all of SDP's fixed capital and operating costs *including* pipeline costs and an adjustment in the treatment of electricity and RECs.

Appendix 8 IPART Information Requirements

IPART's issues paper for its price determination requested some specific information requirements for SDP. The table below outlines the information requested by IPART and indicates the section of the submission where the information has been provided. Note that some of the information requested by IPART is subject to commercial-in-confidence requirements and therefore is being provided to IPART separately.

Information Requirement	Response in Submission
Regulatory Framework	
Information on all contracts relating to the desalination plant between: • SDP and the Blue Water Joint Venture • Sydney Water and the Blue Water Joint Venture • SDP and Veolia Water Australia Pty Limited • Sydney Water and Veolia Water Australia Pty Limited.	Chapter 1 and 3, and Appendix 1 and 2. Nb. There are no contracts between Sydney Water and Blue Water Joint Venture or separately with Veolia Water.
Information on all contracts concerned with the purchase of renewable energy to operate the plant or the sale of renewable energy.	Chapter 1 and 3, and Appendix 1 and 2.
Information on any contracts between SDP and Sydney Water.	Chapter 1.
The details of any contracts to which SDP is party or which affect the commercial risk of its operations.	Chapter 1 and 3, and Appendix 1 and 2.
An explanation in SDP's pricing submission of the major aspects of SDP's various contracts that may impact our price determination for the desalination plant.	Chapter 1 and 3, and Appendix 1 and 2.
The risks or uncertainties in SDP's operating environment over the ongoing period and beyond, including the nature of these risks and uncertainties and the likelihood of these affecting specific costs (eg, energy costs).	Chapter 3, 4 and 6, and Appendix 4.
Length of the determination	
Its preferred starting date for the determination and its reasons for that preference.	Chapter 1.
Determining the costs to be recovered	
The nature and level of its fixed costs not classified as allowance for return on assets, allowance for return of assets.	Chapter 3.
SDP's capital expenditure (in nominal terms), from 1 July 2007 to 30 June 2012 itemised by year.	Appendix 2.

SDP's projected capital expenditure (in $2011/12), from 1 July 2012 to 30 June 2017, itemised by year.	Chapter 5. Nb. Projected expenditure is expressed in $2011-12 as CPI for June 2010-June 2011 will not be available from the ABS until late July 2011.
Drivers of this projected expenditure and expected service outcomes to be achieved.	Chapter 5.
A list of the assets owned by SDP and the cost of each asset (in nominal terms) itemised by year.	Appendix 2.
SDP's asset management practices and plans, and the relationship between its asset management framework and its capital expenditure program.	Refer to the Infrastructure Operating Plan for SDP's Network Operator Licence under the Water Industry Competition Act.
Rate of return	
The likelihood and nature of a market for desalinated water emerging in the future and particularly over the next price path.	Chapter 2.
The current or proposed contractual arrangements for the management and operation of the plant and supply of water and the impact of these arrangements on the systematic risk for SDP.	Chapters 1, 4 and 6.
The rate of return SDP is seeking, and the justification for this rate of return, taking into account the commercial risks inherent in its provision of services.	Chapter 4.
The values that should be assigned to the various parameters included in the WACC calculation.	Chapter 4.
What are the conditions that apply when SDP stops supplying water but is still able to recover all its fixed costs? Are there any performance standards or requirements that SDP must meet or penalties that it will incur when it is not supplying water but is still recovering its fixed costs?	Chapter 6.
What incentives, other than financial, are there for SDP to produce water?	Chapter 6.
What incentives, other than pricing, are there for SDP to produce water at different times, depending for example on the level of water in the SCA's dams?	Chapter 6.
What are the incentives to supply customers other than Sydney Water?	Chapters 2 and 6.
Depreciation	
SDP's proposed approach to the treatment of depreciation of assets, including estimates of the assets' economic lives.	Chapter 5.
SDP's proposed depreciation allowance for assets for the period 1	Chapter 5.

July 2007 to 30 June 2012 (nominal terms); its proposed depreciation allowance for new assets over the upcoming period from 1 July 2012 to 30 June 2017 (in $2011/12); the means of calculating the allowances; justification for this methodology and detail of the assumptions underpinning the calculations; the weighted average economic life of its new assets over the period 1 July 2012 to 30 June 2017.	
Fixed costs	
The reasoning behind its identification of the fixed portion of its operating costs.	Chapter 3.
SDP's efficient fixed operating expenditure itemised on an annual basis from 1 July 2007 to 30 June 2012 (in nominal terms). Operating costs for this purpose are those operating costs that are incurred in the making available of the desalination plant to supply non-rainfall dependent drinking water and should reflect the fixed component of operating costs.	Not required.
SDP's projected efficient fixed operating expenditure itemised on an annual basis over the period from 1 July 2012 to 30 June 2017 (in $2011/12), including drivers of this expenditure, expected service outcomes, specific efficiency programs and the potential for efficiency gains. Operating costs for this purpose are those operating costs that will be incurred in the making available of the desalination plant to supply non-rainfall dependent drinking water and should reflect the fixed component of operating costs.	Chapter 3.
Variable costs	
The cost to produce a megalitre of desalinated water (in $2011/12) for those efficient costs that vary with output. Costs for this purpose are those that are incurred in supplying non-rainfall dependent drinking water.	Chapter 3.
If applicable, the cost to produce a megalitre of desalinated water (in $2011/12) for those efficient costs that vary with different production levels. Costs for this purpose are those that are incurred in supplying non-rainfall dependent drinking water.	Chapter 3.
An explanation of SDP's method of calculating the cost per megalitre of desalinated water including, but not limited to, information on inputs such as: • The annual costs (in nominal terms) for the period 1 July 2007 to 30 June 2012 that vary with output itemised into categories including but not limited to variable energy, labour costs, maintenance costs and chemical costs. • The forecast annual costs (in $2011/12) for the period 1 July 2012 to 30 June 2017 that vary with output itemised into categories including but not limited to variable energy, labour costs, maintenance costs and chemical costs. • The annual volumes of water used to calculate the value for the cost per megalitre of water for costs that vary with output, and an explanation of the methodology used to estimate those volumes.	Chapter 3 and Appendix 2.

The drivers of this forecast expenditure that varies with output, expected service outcomes, specific efficiency programs and the potential for efficiency gains.	Chapter 3.
Green power	
Whether SDP is seeking to recover the costs of using green power to operate the Sydney Desalination Plant.	Chapter 2.
Estimates of the difference in cost between using green power and the cheapest available conventional source of power to operate the plant, given the plant's different levels of operation.	Chapter 3.
In the future, if the price of green energy for the desalination plant becomes lower than the price of conventional energy, whether SDP can on-sell any excess green energy it purchases through its contractual arrangements?	Chapter 1 and Chapter 3.
Determining prices	
Is SDP seeking determination of prices applicable to customers other than Sydney Water? If so, is SDP seeking the same prices for all its customers? Why?	Chapter 2 and Chapter 6.
If there is potentially more than 1 customer, whether the fixed costs should be recovered from Sydney Water alone or from all customers?	Chapter 6.
If there is potentially more than 1 customer and if the fixed costs are to be recovered from all customers, how the charges should be structured to achieve this and the rationale for this suggestion?	Chapter 6.
If there is potentially more than 1 customer, who should pay for the fixed costs envisioned under the Terms of Reference if the desalination plant is not producing water for an extended period of time? Why?	Chapter 6.