Infrastructure contributions

How we apply IPART's pricing method to calculate prices

Version 1.3 – November 2023

Sydney WATER

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1 Executive summary

Sydney Water provides essential services to the people of Sydney, the Blue Mountains and the Illawarra. A growing population is increasing demand for our services, creating a need for significant investment in new infrastructure.

Following a change in NSW policy, any development completed after 1 July 2024 will recommence contributing towards the cost of providing infrastructure and services to meet their needs[1]. This change is in line with pricing that was in place in NSW before 2008 (and, indeed, had been in place since the 1960's). Today, most utilities across Australia require developers to contribute to the costs involved in water and wastewater systems for new developments.

The infrastructure contribution price payable by each development is worked out using a method set by the NSW Independent Pricing and Regulatory Tribunal (IPART) in their 2018 Determination[2]. This document provides information on how we apply IPART's Determination.

1.1 Our application of IPART's pricing method

IPART's methodology for infrastructure contributions is designed to work in tandem with the setting of regulated retail prices for our entire customer base. Costs not recovered through infrastructure contributions will be recovered from the wider customer base via regulated retail prices.

The IPART methodology generates a price payable by development inside discrete Development Servicing Plan (DSP) areas. The price in each DSP recovers the cost of assets needed to serve development, with an adjustment for the revenue to be received from new retail customers.

If servicing costs in an area are very low, it is possible that no contribution will be payable. In these low-cost areas, the normal ongoing revenue from each new customer is enough to cover the cost of providing them with services.

In areas with higher costs, the developer must contribute because revenue from new customers is not sufficient to fully recover costs. If we did not collect a contribution from the new connections enabled by developers, bills for all other customers would have to increase.

Without a framework for infrastructure contributions, the additional costs of new growth are recovered through water and wastewater service contributions from existing customers, placing additional pressure on general water and wastewater prices. The zero-charge policy has reduced the affordability of our services for all customers, already adding up to $200 a year to customer bills (to 2022) with the potential for a further annual increase of $200 or more over the coming years as we invest to serve new development.

IPART does not specify the number or size of DSP areas, instead leaving the design of DSPs as something to be worked through with developers and customers. We have engaged with

[1] Water, wastewater and stormwater infrastructure contributions in metropolitan areas were set to zero by the NSW Government in December 2008. This policy was rescinded from 1 January 2022.
[2] IPART (2018) *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system.*

stakeholders to understand their preferences, while considering the objectives of IPART's method and the principles for infrastructure contributions identified by the NSW Productivity Commission[3]:

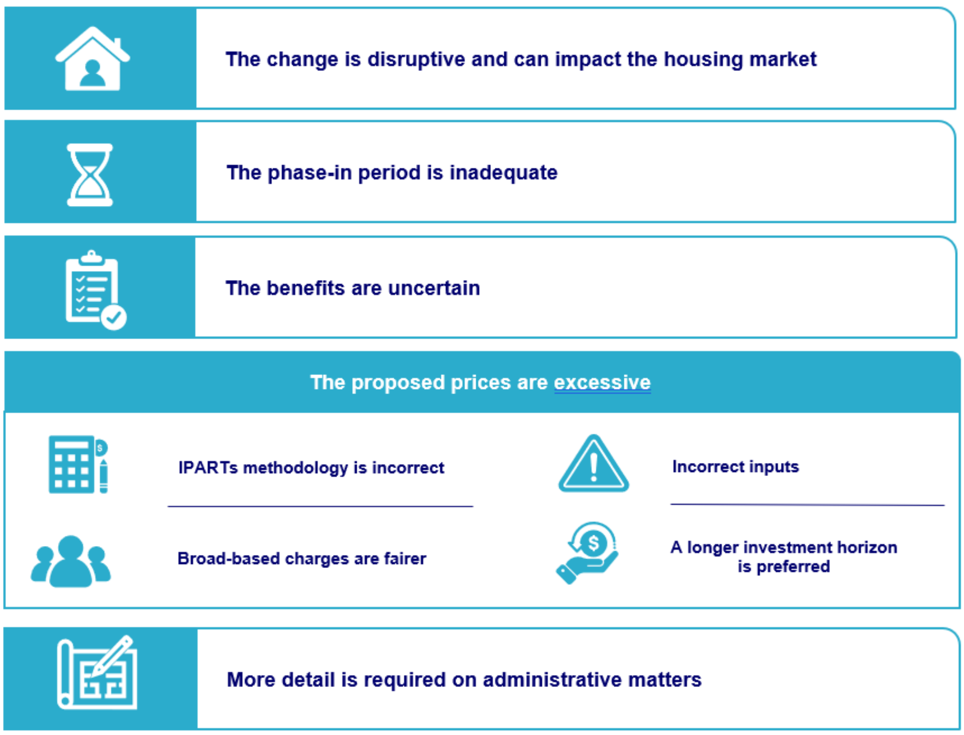
- Simple
- Consistent
- Transparent
- Efficient; and
- Certain.

1.1.1 Public exhibition of draft proposals

A set of proposed DSP areas and infrastructure contribution prices were placed on public exhibition for a period of 51 working days, from 28 April 2023 to close of business on 7 July 2023. Our proposal consisted of 10 wastewater DSPs and four drinking water DSPs. In combination, we considered these areas would provide a meaningful price signal to guide development in our area of operations, without being overly complex.

A total of 48 submissions were received, covering 60 topics grouped into several common themes.

Figure 1-1 Major themes raised by stakeholders during the exhibition period



[3] NSW Productivity Commission (2020) *Review of infrastructure contributions in New South Wales – Final Report*.

1.1.2 Responding to feedback received during the exhibition period

We thank the industry for taking the time to provide submissions on our pricing proposal. However, about 60 per cent of comments focused on matters outside Sydney Water's control, such as the decision to rescind the zero-charge policy and the phase-in arrangements, and do not affect how we apply IPART's pricing methodology.

We have published a separate document[4] that provides more detail on the various issues raised in submissions, and our response, which was submitted to IPART to support our final proposal.

Many submissions queried the inputs we had used, with a focus on development rates and very high costs in some areas. We checked all our assumptions and took the opportunity to use more recent Government forecasts of future development. In combination, the revised historical data and updated forecasts created a larger base of development from which to recover costs, resulting in lower infrastructure contribution prices in most DSP areas.

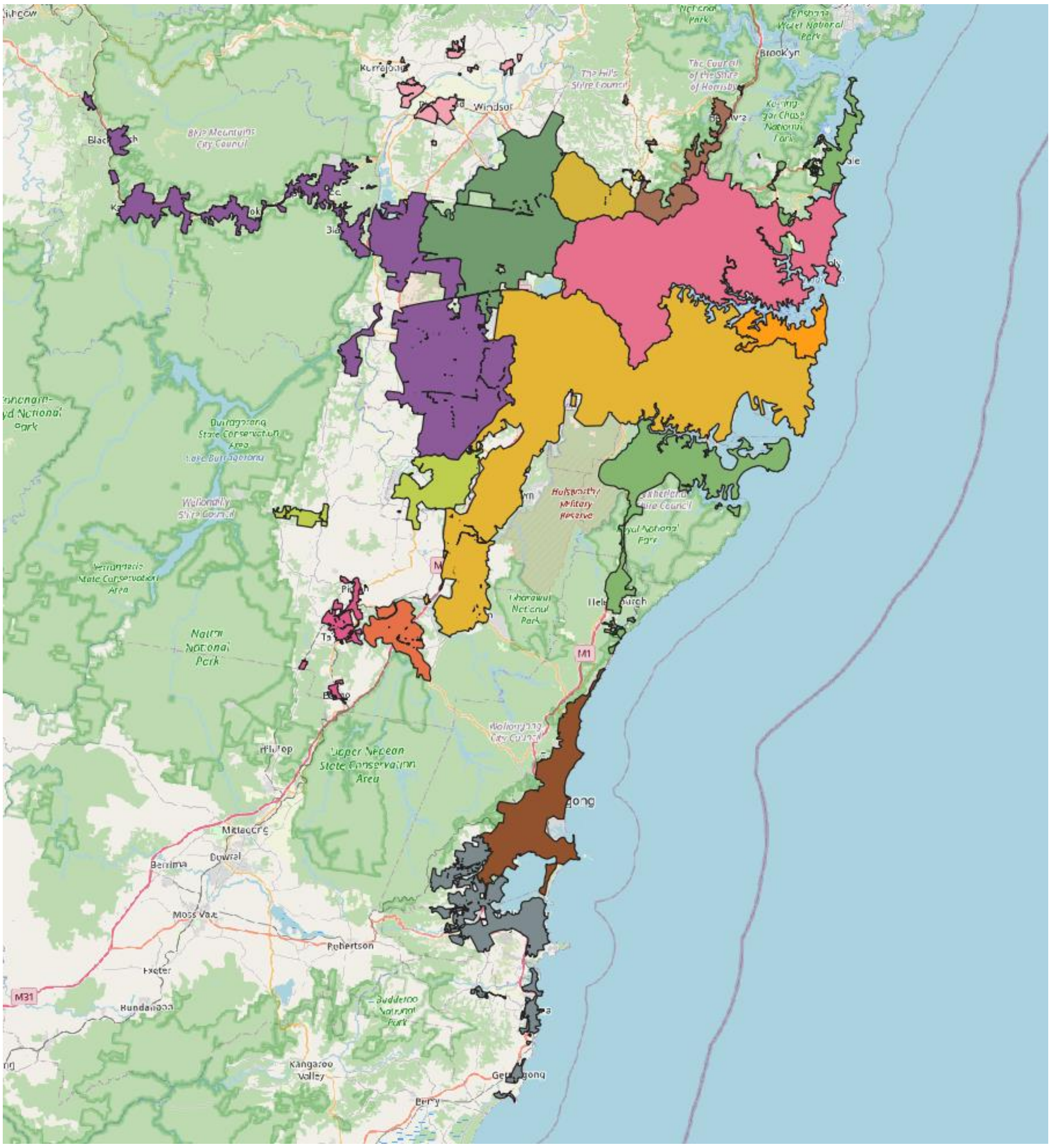
We also received robust feedback on costs in the Greater Macarthur area, including from IPART, focussing on the large difference in cost between systems in the same wastewater DSP. We revisited all DSP areas in light of this feedback, as well as the updated prices.

Our final proposal retained the original four drinking water DSPs, as shown below.

Our final drinking water DSP areas

[4] 'What we heard' – Submissions on our draft water and wastewater infrastructure contributions

Our final wastewater proposal consists of 14 DSP areas, a net increase of four areas compared to the proposal we exhibited.



Final wastewater DSP areas registered by IPART

The base infrastructure contribution prices for each DSP area are shown in **Table 1-1** and **Table 1-2** below. The price is expressed as dollars per equivalent tenement (ET), which is a measure of how much of our services will be used by a development. One ET is equal to the annual total demand of an average detached, single residential dwelling.

On 19 October 2022, the NSW Treasurer issued an approval under section 18(2) of the *Independent Pricing and Regulatory Tribunal Act 1992*, authorising us to charge less than the maximum price calculated under the 2018 Determination until 30 June 2026.

The total amount payable for a specific development is the base price in the relevant DSP area multiplied by our assessment of the net demand for services due to the type of development proposed for that site.

For example, if a residential dwelling uses 200 kilolitres of water in a year, a development that uses 1,000 kilolitres of water is the same as five houses. If the base price is $5,000 per ET, the larger development will be required to pay $25,000 ($5,000 per ET x 5 ETs).

Table 1-1 Final Drinking Water Infrastructure Contribution Prices, $2022-23

Development Servicing Plan	1 July 2024 to 30 June 2025	1 July 2025 to 30 June 2026	From 1 July 2026
Greater Sydney Drinking Water	$820.46	$1,640.93	$3,281.85
Potts Hill Drinking Water	$0	$0	$0
Prospect East Drinking Water	$0	$0	$0
Illawarra Drinking Water	$0	$0	$0

Source: Sydney Water calculations; Prices are indexed each financial year by the Consumer Price Index

Table 1-2 Final Wastewater Infrastructure Contribution Prices ($ / ET), $2022-23

Development Servicing Plan	1 July 2024 to 30 June 2025	1 July 2025 to 30 June 2026	From 1 July 2026
Picton Wastewater	$10,182.22	$20,364.43	$40,728.87
West Camden Wastewater	$1,198.88	$2,397.75	$4,795.50
Wilton Wastewater	$5,541.74	$11,083.49	$22,166.97
Nepean River Wastewater	$4,005.10	$8,010.20	$16,020.40
Richmond Wastewater	$5,344.51	$10,693.52	$21,387.03
Lower South Creek Wastewater	$1,545.83	$3,091.66	$6,183.32
Norwest Wastewater	$990.40	$1,980.79	$3,961.58
Berowra Creek Wastewater	$1,620.53	$3,241.06	$6,482.12
Bondi Wastewater	$0	$0	$0
Malabar Wastewater	$201.18	$402.36	$804.72
North Head Wastewater	$146.95	$293.90	$587.79
Outer Sydney Coastal Wastewater	$595.43	$1,190.85	$2,381.70
Southern Illawarra Wastewater	$3,358.50	$6,716.99	$13,433.98
Northern Illawarra Wastewater	$0	$0	$0

Source: Sydney Water calculations. Prices are indexed each financial year by the Consumer Price Index

Most developments will at least require drinking water and wastewater and will, therefore, be required to pay an infrastructure contribution for each of these services. Charges for other services may also be payable (eg, recycled water or stormwater).

Table 1-3 shows indicative total prices based on feasible combinations of overlapping wastewater and drinking water DSP areas. For example, the total price for a development in the Sydney Coastal Wastewater DSP area depends on whether drinking water is sourced from Potts Hill, Prospect East or a different water delivery system. **Table 1-3** is sorted based on our forecasts of future development over the next 10 years, such that areas with the highest forecasts are listed first and areas with the lowest forecast of development are listed at the bottom.

The actual amount payable by a specific development will be determined during the Section 73 Compliance Certificate process.

Table 1-3 Indicative Combined Infrastructure Contribution Prices (from 2026-27), $2022-23

Wastewater DSP	Matching Water DSP(s)	Combined Price# ($ / ET)
Malabar Wastewater	Potts Hill Prospect East Greater Sydney	$805 $805 $4,087
North Head Wastewater	Potts Hill Prospect East Greater Sydney	$588 $588 $3,870
Lower South Creek Wastewater	Greater Sydney	$9,465
Nepean River Wastewater	Greater Sydney	$19,302
Bondi Wastewater	Potts Hill	$0
Norwest Wastewater	Greater Sydney	$7,244
Southern Illawarra Wastewater	Illawarra Greater Sydney	$13,434 $16,716
Outer Sydney Coastal Wastewater	Potts Hill Greater Sydney	$2,382 $5,664
West Camden Wastewater	Greater Sydney	$8,077
Berowra Creek Wastewater	Greater Sydney	$9,764
Wilton Wastewater	Greater Sydney	$25,449
Picton Wastewater	Greater Sydney	$44,011
Richmond Wastewater	Greater Sydney	$24,669
Northern Illawarra Wastewater	Illawarra	$0

rounded to the nearest whole dollar for presentation purposes

The remainder of this report outlines the data and assumptions we have used to calculate these prices.

2 Introduction

Sydney Water provides essential services to the people of Sydney, the Blue Mountains and the Illawarra. A growing population is increasing demand for our services, creating a need for significant investment in new infrastructure.

This chapter provides background on the reintroduction of infrastructure contributions for Sydney Water, and an overview of the different elements of IPART's methodology for calculating infrastructure contribution prices.

2.1 Reintroducing infrastructure contributions

Between 1964 and 2008, each new development in our area of operations contributed to the cost of infrastructure needed to serve that growth.

From January 2009, water, wastewater and stormwater infrastructure contributions were set to zero by the NSW Government, and the cost of providing new development with these services has instead been recovered from our customers.

The zero-charge policy has reduced the affordability of our services for all customers, already adding up to $200 a year to customer bills with the potential for a further annual increase of $200 or more over the coming years as we invest to serve new development.

The zero-charge policy was not only at odds with how development is funded in the surrounding region (eg, Central Coast Council), but with other jurisdictions throughout Australia and much of the developed world. Following a review by the NSW Productivity Commission[5], the NSW Government accepted a recommendation to reintroduce infrastructure contributions for Sydney Water (and Hunter Water, which had also been set to zero).

Any development completed after 1 July 2024 will need to contribute to the cost of providing infrastructure to meet their service needs.

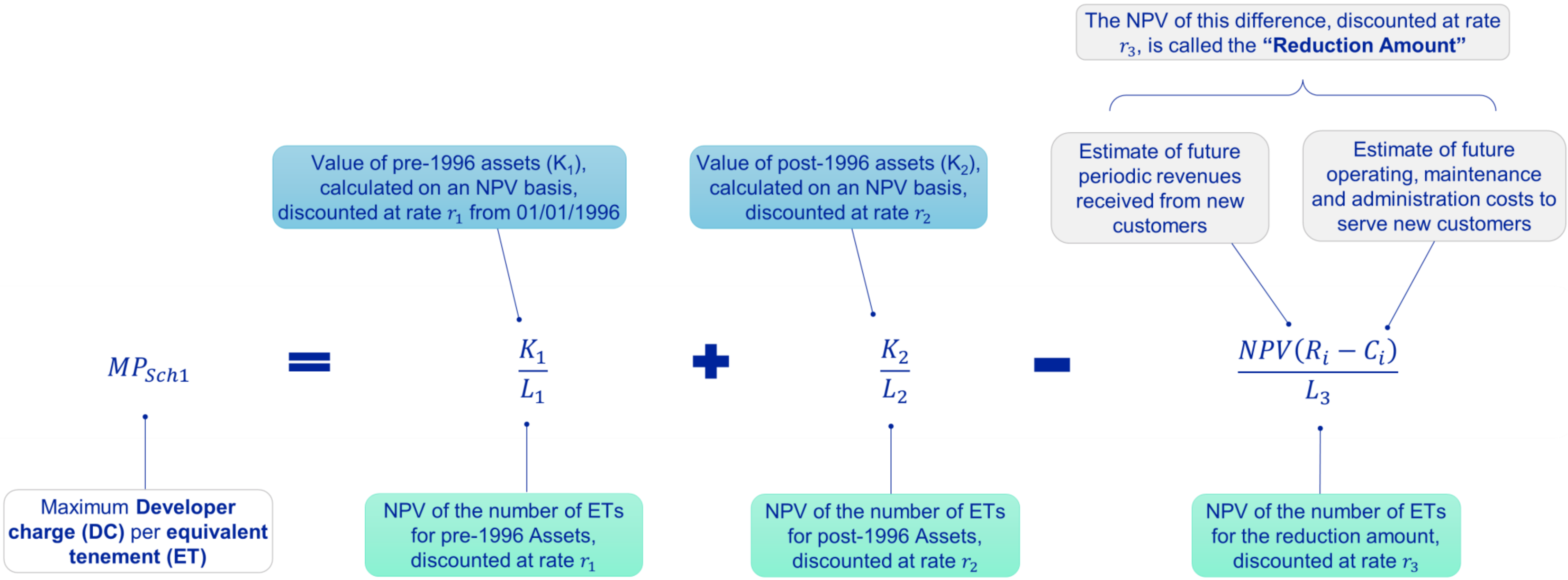
2.2 IPART's infrastructure contribution price methodology

The method we use for setting infrastructure contribution prices has been regulated since 1995[6], and has been reviewed and updated by IPART several times. The most recent review was completed in 2018 when IPART issued a new determination[7] for calculating infrastructure contribution prices for water, wastewater and stormwater services.

The main elements of IPART's pricing method are shown in **Figure 2-1**.

[5] NSW Productivity Commission (2020) *Review of infrastructure contributions in New South Wales – Final Report*.
[6] Government Pricing Tribunal (1995) *Sydney Water Corporation Prices of Developer Charges for Water, Sewerage and Drainage Services*.
[7] IPART (2018) *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system.*

Figure 2-1 IPART's infrastructure contribution pricing method



Some of the key features of IPART's method include:

- Both past and future assets are included, as past assets can provide capacity to serve development for many years into the future.
- Because we are dealing with past and future quantities, all inputs are converted to a common base year using a process known as discounting. Discounting converts past or future values into their equivalent value today.
- Discounting means that, everything else held constant, all developments pay the same (real) price regardless of when they occur.
- Costs are shared based on demand for services. The unit of demand is an 'equivalent tenement', which is defined as the total annual demand of a single, detached residential dwelling.
- Credit is given for the future revenue we will receive from new connections over the next 30 years, less O&M costs.
- If development can be served at a low cost, the infrastructure contribution price in some locations may be zero.

2.3 We are not able to implement other pricing methods at this time

From time to time, stakeholders have proposed we use other pricing methods and/or have made suggestions about how we might implement IPART's method. For example, the NSW Branch of the Urban Development Institute of Australia (UDIA) has recommended an implementation approach they refer to as 'spread the base' (see Box 1 for a summary of this approach).

Sydney Water aims to be easy to deal with and provide value for money for all customers, including developers. Our approach to the reintroduction of infrastructure contributions has considered the principles outlined by the NSW Productivity Commission in their review of infrastructure contributions, such as transparency, simplicity, and cost-reflectivity.

While we think there are aspects of IPART's method that could be improved, a full review of the method was completed in 2018, and stakeholders had an opportunity to suggest changes at that time.

Under our Operating Licence, we must set the level of fees and charges in accordance with any relevant IPART price determination, which includes the 2018 Determination.

Box 1: UDIA's 'Spread the Base' pricing method

In September 2022, UDIA NSW wrote to Sydney Water with a set of recommendations regarding the reintroduction of infrastructure contributions. Recommendation 3 was that we should investigate a 'Spread the Base' approach to setting contribution prices, as a means of improving on IPART's methodology and achieving a broader base of funding support.

The suggested pricing model consists of three distinct layers, each of which would set a different price payable by developers:

- Layer 1 – a flat charge applying to all development in all locations
- Layer 2 – a charge that varies by catchment and/or treatment plant servicing area, payable by all development in the relevant catchment
- Layer 3 – a charge that is specific to greenfield precincts but may also vary between precincts.

The layers are intended to be cumulative, such that the total amount payable by any given development would depend on how many individual layers were 'triggered'.

UDIA suggests the Layer 1 charge would provide a more regular funding stream that would help 'seed fund' the delivery of infrastructure across our area of operations.

Layer 2 provides a cost-reflective locational price signal that largely focusses on the impact of development on existing assets, which is enhanced by a third layer that recognises the higher costs often needed for new assets to serve greenfield areas.

Some comments on UDIA's 'Spread the Base' method

While there are positive features of the UDIA's method, after careful consideration we have concluded that it can't be implemented within the bounds of IPART's current determination and may have unintended consequences. In particular:

- Seeking to levy a flat charge in all locations may result in developers being asked to pay a price that is above the maximum price calculated using IPART's method, which is not permitted under legislation[8]. This is a threshold issue that can't be readily resolved under the current determination.
- UDIA suggests the Layer 1 price will result in additional (or at least more certain) revenue than IPART's method. However, a flat charge will only provide additional revenue compared to IPART's method if it is not cost-reflective and operates more like a tax. This is inconsistent with the intent of IPART's method.
- If, instead, we assume that the combination of all three layers must be cost-reflective in aggregate, a flat charge for Layer 1:
  - could create a material cross-subsidy that reduces the amount paid by developers in high-cost locations. The final impact of the cross-subsidy would be borne by retail customers, who would otherwise see downward pressure on their bills from development in low-cost areas.
  - could have a similar effect to removing the 'reduction amount' parameter from IPART's method which is, in part, designed to prevent 'cherry picking' by private water utilities in low-cost areas. A flat charge, set high enough above the efficient price, may encourage private water utilities to provide services in the area even though they are higher cost. In these situations, the cross-subsidy would instead benefit private water utilities, with no benefit to developers and increased costs for retail customers.

In many other respects the UDIA proposal is very similar to IPART's method, including higher contribution prices that vary by location based on underlying costs. Consistent with the spirit of UDIA's submissions, we have attempted to develop a proposal that reduces some of the complexity that existed in our previous implementation of IPART's determination.

[8] See section 18(1A) of the *Independent Pricing and Regulatory Tribunal Act 1992*

3 Standards of service we must meet

This chapter sets out the standards of service provided to customers and the design parameters for our assets. This information is required under Schedule 4, Clause 1(f) of the 2018 Determination.

3.1 Sydney Water Operating Licence

Sydney Water is a statutory state-owned corporation (SOC), wholly owned by the NSW Government, established under the *Sydney Water Act 1994* to provide the following principal functions[9]:

- Storing or supplying water
- Providing sewerage services
- Providing stormwater drainage systems
- Disposing of wastewater.

Sydney Water can only carry out these functions under the authority of an operating licence inside a defined area of operations. Our Operating Licence[10] contains terms and conditions that we must meet when performing our principal functions, including quality and performance standards. Sydney Water is also required to maintain various management systems, including an asset management system that is consistent with AS ISO 55001:2014.

Our performance against the Operating Licence is audited each year, and non-compliance can result in enforcement action.

New connections to our systems could adversely affect performance against the Operating Licence, and this may trigger a need for investment in new or upgraded assets to ensure compliance. Investment triggered by the (actual or forecast) impact of new connections is eligible to be recovered in our infrastructure contribution prices, provided there is a clear nexus between the proposed investment and the effects of new connections.

The quality and performance standards that can be affected by the cumulative impact of new connections are summarised in **Table 3-1**. See section 3.3 for more information on how we assess the need for new assets.

[9] Sydney Water Act, s 12
[10] https://www.sydneywater.com.au/content/dam/sydneywater/documents/operating-licence.pdf

Table 3-1 Operating Licence standards that may be affected by new connections

2019-2023 Licence standard	Effect of new connections	Example costs
Water pressure		
9,999 properties per 10,000 experience fewer than 12 water pressure failures each financial year (pressure < 15m head for a continuous period of one hour or more)	Additional demand may reduce water pressure in a system, leading to water pressure failures in some conditions	Booster pumps Pipe amplification System re-configuration New reservoirs
Dry weather wastewater overflows		
9,928 properties per 10,000 are unaffected by an uncontrolled wastewater overflow each financial year 9,999 properties per 10,000 are affected by fewer than three uncontrolled wastewater overflows each financial year	Additional flow in our wastewater mains, leaving less capacity to offset the impact of sewer chokes or other operational incidents	Pipe amplification Additional emergency relief structures Source control
Drinking water		
Maintain a Drinking Water Quality Management System consistent with Australian Drinking Water Guidelines and any requirements specified by NSW Health	Additional demand may reduce the effectiveness of existing measures for meeting water quality requirements	Additional treatment and/or dosing capacity Storage
Water continuity		
9,800 properties per 10,000 are unaffected by an Unplanned Water Interruption each financial year (no water supply for more than five continuous hours)	Geographical expansion of the water supply network may lead to longer response times	Additional repair crews in new locations (on-going operational expense)

3.2 Environment Protection Licences

In addition to the Operating Licence, many of our activities fall within the scope of the *Protection of the Environment Operations Act 1997* and are controlled by conditions set out in Environment Protection Licences (EPLs) issued by the NSW Environment Protection Authority (EPA).

EPA maintains a public register of all licences, which is available on their website[11]. We also have a list of EPLs relevant to our activities. These can be found on our website[12].

Licence conditions typically vary across our area of operations to reflect the unique, local environmental conditions that may be affected by our activities. For example, some of the existing treatment plants in the catchment of the Upper Nepean River are not permitted to discharge any

[11] https://epa.nsw.gov.au/licensing-and-regulation/public-registers
[12] https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/wastewater-network/epa-reports.html

treated effluent at all in dry weather to protect local waterways. Along the coast, treatment standards can also be higher where releases occur near sensitive sites, such as swimming beaches, but other facilities may only require basic treatment (known as primary treatment).

New connections to our systems could adversely affect performance against our EPLs (eg, see **Table 3-2**), and this may trigger a need for investment in new or upgraded assets to ensure compliance.

Table 3-2 Environment Protection Licence standards that may be affected by new connections

Standard	Effect of new connections	Example costs
Concentration limits		
Limits on the concentration of substances released to the environment	Additional demand may reduce the effectiveness of existing measures for meeting concentration limits	Additional capacity Upgraded treatment Source control
Load limits		
Limits on the total quantity of substances released to the environment	Additional demand adds load to our systems, exceeding the capacity of existing measures designed to meet load limits	Additional capacity Source control
Discharge limits		
Limits on the number of times substances are released to the environment	Additional flow may exceed the capacity of our mains, leading to overflows to the environment under certain conditions (number, duration and/or volume of releases may increase)	Additional capacity – new mains, storage Source control
Process and technology limits		
Limits on when and/or whether treatment processes do or do not have to be used	Additional flow may exceed the hydraulic capacity of process units under certain conditions	Additional capacity Source control
Safeguards		
Requirements for safeguards to mitigate the impact of failures (eg, available storage at pump stations to hold the equivalent of four hours of peak dry weather flow; backup generators to allow pumps to operate in blackouts)	Additional flow may reduce the effectiveness of safeguard mechanisms (eg, reduced response time increases risk of unauthorised releases to the environment)	Additional equipment or capacity

Investment triggered by the (actual or forecast) impact of new connections is eligible to be recovered in our infrastructure contribution prices, provided there is a nexus between the proposed investment and the effects of new connections.

For some issues, establishing a nexus between new connections and the need for investment is not straightforward (eg, see section 3.2.2, which discusses investment to address wet weather sewage overflows).

3.2.1 EPA's zonal licensing approach for discharges to inland waterways

In 2019, the EPA finalised details of a new licensing framework to regulate nutrients in the Hawkesbury-Nepean River catchment to avoid increased risks of algal blooms and aquatic week outbreaks associated with significant population growth predicted for the catchment (see Box 2).

The new framework divides the catchment into different zones and subzones, with nutrient caps applying in each area.

Table 3-3 Sydney Water treatment plants by Hawkesbury Nepean EPL zones and subzones

Yarramundi Zone	Sackville Zone	Berowra Zone
Subzone 1: Bingara Gorge / Wilton Picton Upper Nepean West Camden	Subzone 1: Richmond North Richmond	Hornsby Heights West Hornsby
Subzone 2: Penrith Upper South Creek Wallacia Winmalee	Subzone 2 Quakers Hill Riverstone St Marys	
	Subzone 3: Castle Hill Rouse Hill	

Adapted from EPA (2019) *Regulating nutrients from sewage treatment plants in the Lower Hawkesbury Nepean River catchment*

Box 2: Managing nutrients in the Hawkesbury-Nepean River

Improved catchment practices and wastewater treatment plant upgrades have significantly improved water quality, but nutrients still contribute to algal blooms and aquatic weed outbreaks in parts of the Hawkesbury-Nepean River system.

The new regulatory framework was developed to manage the risk of current licence caps not being suitable for the predicted increase of effluent discharges and nutrient loads due to population growth. The new regulatory framework will:

- set concentration limits for nutrients from treatment plants, having regard to plant age
- cap nutrient loads discharged to the river at 2019 levels
- allow load-trading between treatment plants and offsetting treated sewage loads with other types of load, for example diffuse run-off capture from agricultural premises.

The framework will be reviewed every four years, but loads are expected to continue to be reduced over time.

Source: NSW EPA (2019) *Regulatory Assurance Statement 2018-19*

3.2.2 Our approach to wet weather overflow investments and DSPs

Background

In Sydney, modern wastewater and stormwater systems are intended to be separate. The wastewater system was designed to collect used water from homes and businesses and transport it to wastewater treatment plants. However, stormwater can still enter the wastewater system from various sources including:

- illegal connections of stormwater pipes to the wastewater network;
- faults in Sydney Water's wastewater pipes, such as ineffective seals; and
- faults in privately-owned wastewater pipes.

Plumbing standards[13] recommend that wastewater pipes be designed with capacity to cater for incidental entry of stormwater (generally up to four times average dry weather flow). Despite this, in many parts of our area of operations the combined flow following heavy rainfall events may exceed the capacity of the system.

To prevent the wastewater system backing up into people's properties during periods of higher flows, our networks are designed with emergency relief structures that allow the excess wastewater to overflow in locations that minimise the risk to public health and the environment.

[13] Eg, *Sewerage Code of Australia – Sydney Water Edition – Version 4*

We may also construct storage tanks at some emergency relief structures to temporarily hold excess volumes rather than discharge to the environment. Once the rain event has passed and flows have begun to return to normal, the volume held in storage drains back to the wastewater network for transport to a treatment facility.

Excess flow arriving at our wastewater treatment plants may also exceed the capacity of the treatment process, which could result in the release of partially treated (but fully disinfected) wastewater to the environment. The release of partially treated disinfected wastewater is defined as a wet weather overflow for licensing purposes.

EPL requirements for wet weather overflows

Wet weather overflows are regulated via limits on the number of overflow events that may occur in a 10-year period. The licence limits differ for each of our wastewater systems (and sometimes at a sub-system level), and for each of our wastewater treatment plants. Further detail is contained in Appendix 8.5.

For the Bondi, Cronulla, Malabar and North Head wastewater networks, the frequency of overflows must not increase over time compared to a baseline level set in 2016-17. In all other networks (except Picton and Brooklyn), Sydney Water must not allow the frequency of overflows to exceed the long-term target set in the early 2000s based on our Sewerage Overflow Licensing Project (SOLP) (see Appendix 8.5).

Similarly, the frequency of wet weather overflows (partially treated discharges) at the Bondi, Cronulla, Malabar and North Head wastewater treatment plants must not exceed a set number of events per 10 years. At all other wastewater treatment plants (except Picton), Sydney Water must not allow the frequency of overflows to increase over time compared to a defined baseline.

Investment to manage overflows and the nexus to growth

As outlined above, wet weather sewage overflows can occur when rainwater finds its way into the wastewater system (including via faulty private plumbing), leading to high flows that exceed the capacity of our wastewater assets. If the underlying causes are left unresolved, the volume of rainwater entering the wastewater system may increase over time leading to an increase in the number and/or duration of overflow events.

New connections can also contribute to an increase in overflows over time. This can occur because each new connection adds to the base flow in the wastewater system, reducing the amount of air space in our pipes. When a rain event does occur, pipes will reach capacity sooner, leading to more frequent and/or longer duration overflow events. Investment in overflow abatement measures to offset the impact of new connections would be eligible for inclusion in IPART’s infrastructure contribution pricing method.

In practice, however, both drivers may be relevant in the same wastewater system, creating a need to apportion the cost of overflow abatement between the growth and non-growth drivers. Our approach is summarised in **Table 3-4**.

Table 3-4 Apportionment of overflow abatement between growth and non-growth drivers

Outcomes of planning investigations	Share of costs allocated to the DSP
1. Sydney Water has completed source control works in the catchment to reduce inflow and infiltration, meaning any forecast increase in overflows is highly likely due to growth	
a. System breaches the EPL now and gets worse over time	a. 0%
b. System does not breach EPL now but is forecast to breach in future	b. Up to 100% of costs recoverable in the DSP
2. Sydney Water has not completed source control works in the catchment, meaning overflows are mainly driven by existing faults and not due to growth	0% (all investment excluded and not recoverable in the DSP)

Sydney Water aims to deliver solutions that achieve the desired outcome(s) at the least cost and with an acceptable level of risk. Investing in 'source control' measures to reduce the amount of rainwater that can enter the wastewater system is often the most cost-effective solution, helping to avoid discharges to the environment and/or the need for costly 'end-of-pipe' solutions such as storage. As such, the projects recovered in the infrastructure contribution price may include work on rectifying existing pipes (or other assets) even if they are privately owned.

3.3 Design parameters for assets

In addition to regulatory instruments such as the Operating Licence, the design of water, wastewater and stormwater systems occurs in the context of what might be termed 'quasi-regulatory' documents such as Australian Standards and Industry Codes of Practice.

The rest of this section outlines some of the major considerations that influence the design of our systems, and which may result in recommendations for the construction of new assets to cater for the impact of new connections.

3.3.1 Design of drinking water systems

Water system assets are generally sized for a specific demand type (see **Table 3-5**). Understanding the potential variability of demand over the years, months, weeks and days is crucial to selecting fit for purpose assets. If new connections will add to water demand in an area, we need to understand whether existing assets can provide a reliable level of service and, if not, what changes may be required.

Estimates of future demand are a combination of the number and type of new properties expected in an area (eg, residential, non-residential) and anticipated water use by each type of property. Our approach to forecasting growth in properties is described in section 5.3. In relation to anticipated water use per property, we may use site-specific information where this is available, or we may apply default assumptions to provide an indicative estimate of potential demand (see **Table 8-10** in Appendix 8.6).

Table 3-5 Demand design types for water system planning

System component	Asset type	Demand Type		
		Max Week or Design Period#	Max Day	Max Hour
Bulk water	Raw water supply	x	x	
	Water filtration plat	x	x	
Delivery system	Water pumping station	x	x	
	Reservoir	x	x	
	Trunk transfer main	x	x	x
Local supply system	Pumping station – surface	x	x	
	Reservoir – surface	x	x	
	Pumping station – elevated			x
	Reservoir – elevated			x
	Outlet main (single zone)			x
	Outlet main (zones with recycled water)	x	x	x
	Reticulation mains			x

a design period of eight consecutive high demand days is sometimes used to assess the impact of greenfield development if demand (volume out) could exceed input capacity (volume in).

In general, longer term asset planning will reflect default demand assumptions, and this will be refined as we prepare individual business cases for the delivery of assets.

3.3.2 Design of wastewater systems

Similar to our planning for drinking water systems, when we expect more wastewater volumes in an area, we need to understand whether existing assets can provide a reliable level of service and, if not, what changes may be required. The planning process includes:

- Confirmation of existing wastewater flows
- Estimation of base, average (ADWF) and peak (PDWF) dry weather flows with new connections, plus any allowance for wet weather flows (see **Table 3-6**)
- Using calibrated software models of sewer catchments, assess capacity and performance against relevant criteria (see **Table 3-7**) over time (2026, 2031, 2041, and 2051)
- Identify options for addressing identified issues

Table 3-6 Design criteria for estimating wastewater flows

Flow type	Approach to estimating flows
System wide base flow	10% of total dry weather flow
Average dry weather flow	
Residential	150 litres / person / day
Commercial	Number of employees x 0.225 or 75 EP per net hectare
Industrial	30-50 EP per net hectare for light industrial, 150 for heavy industry
Peak dry weather flow	Derived from diurnal flow curves
Wet weather flows	If source control has been undertaken, use current inflow/infiltration rates If no source control, determine inflow/infiltration trend over past 10 years If inflow/infiltration is increasing, assume it continues for 20 years, with no change after 20 years 2% inflow / infiltration rate for growth areas with low infiltration sewer 1% inflow / infiltration rate for growth areas with low pressure sewer

Table 3-7 Criteria for assessing wastewater system performance

Performance criteria for wastewater systems#
No dry weather overflows in the network
No dry weather by-pass at wastewater treatment plants
Peak dry weather flow is less than 60% of pipe capacity^
At pumping stations, there is capacity to store four hours of peak dry weather flow in emergencies
At pumping stations, detention time at average dry weather flow is two hours or less
At pumping stations, pump capacity is at least 2.5 times peak dry weather flow
Compliance with EPL limits for wet weather overflows
For systems without an EPL limit, wet weather overflow frequency does not exceed 10 events in 10 years
No customer experiences a repeat surcharge inside their home
No customer experiences manhole surcharges within their property boundary at a frequency more than 5 times in 10 years

system performance is assessed for (1) a 7 day period of no rain, and (2) wet weather performance over a 10-year time-series of historical rainfall (1985 – 1994)

^ not considered for automatic augmentation unless wet weather performance issues are also present

4 Choosing Development Servicing Plan areas

While IPART's infrastructure contribution method involves the calculation of prices for a discrete DSP area, the 2018 Determination does not prescribe how to set DSP areas. The Final Report accompanying the 2018 Determination included the following guidance:

> Developer charges should signal the location-specific costs of development. If DSP areas are too small, the administrative costs … may be too high and there may be undue price variations between areas and even, over time, within an area. On the other hand, if DSP areas are too large, costs could be averaged across disparate areas, lowering administrative costs but nullifying the price signal. Our current approach is to not prescribe how to set DSP areas; therefore, utilities can balance cost-reflectivity and administrative costs.

IPART | Final report – maximum prices to connect, extend or upgrade a service, p 63

We would also note that costs not recovered via infrastructure contributions must be recovered via normal retail bills across our entire customer base, and this can also be an important consideration when defining DSP areas due to certain features of IPART's methodology.

This chapter sets out our approach to defining DSP areas. This information is required under Schedule 4, Clause 1(c)(2) of the 2018 Determination.

4.1 How our systems are organised

4.1.1 Drinking water

Every day, we supply about 1.5 billion litres of drinking water to over 5.3 million people in their homes and businesses.

Our water network is flexible and many of our water delivery systems are interconnected. This means we can divert water between systems to meet demand in different areas or shut down areas for maintenance or repairs. However, all systems must meet the same stringent standards for drinking water quality.

We supply water from 11 major dams through 13 water delivery systems, with:

- 22,600 kilometres of pipes
- 247 reservoirs
- 152 drinking water pumping stations
- 9 water filtration plants (four of these are privately owned and operated)
- Sydney Desalination Plant (privately owned and operated).

4.1.2 Wastewater

Wastewater, also known as sewage, is the used water that goes down sinks, toilets and drains all over Greater Sydney. We keep it moving while protecting the health of our customers and minimising the impact on the environment. To do this, we collect and process wastewater through a complex, coordinated combination of carefully monitored facilities and a network of pipes.

We have 24 separate systems, with around:

- 27,000 km of wastewater pipes
- 695 sewage pumping stations
- 29 resource recovery facilities (some of which only receive flow in wet weather)

Treating wastewater is about removing or breaking down what people have added to the water that leaves their home or business. We use different processes to remove impurities from wastewater at our facilities. The type of treatment needed depends on:

- the facility's location
- where the treated water will be discharged or reused
- the nature of the facility's catchment area, including wastewater quality.

4.1.3 Stormwater

Urban environments are packed with hard surfaces such as roofs, roads and footpaths that prevent rain from soaking into the ground. Stormwater is the water that flows on those surfaces after rain. Often it flows from property drains to street gutters operated by local councils, and these may connect to our large channels, pipes and creeks. This is what forms the stormwater drainage system.

Our stormwater network currently provides services to about 634,530 properties. It consists of:

- 73 catchments
- 457 kilometres of channels and pipes
- over 70 stormwater quality improvement devices

On 25 March 2022, the NSW Government announced the appointment of Sydney Water as the trunk drainage authority for stormwater in the Western Sydney Aerotropolis, including the Mamre Road Precinct. This means we will be responsible for delivering, managing and maintaining the regional stormwater network along with our drinking water, wastewater and recycled water networks.

Our plan in the Aerotropolis region is for stormwater to flow into natural water channels and wetlands instead of relying on buried concrete pipes or drains. The stormwater will then be collected in wetlands where it can then be harvested, treated and reused as recycled water for irrigation of parks, flushing toilets and creating a cooler, greener, Western Parkland City.

4.2 Options for selecting DSP areas

When infrastructure contributions last applied, we had more than 70 individual DSP areas. Consistent with the recommendations of the Productivity Commission, we considered whether we could simplify the DSP areas this time around. We identified several different DSP concepts, which are summarised in **Table 4-1**.

Table 4-1 Long-list of concepts for defining DSP areas

Name	Concept for defining DSP areas	Screening assessment
1. System hydraulics	DSPs set based on hydraulically discrete parts of the network, such as reservoir zones (water) or pump station catchments (wastewater)	Very strong locational price signals. Very high complexity, 300+ DSP areas Not taken forward.
2. Common assets	Each DSP is a collection of discrete areas served by a common major asset, such as a treatment plant	Good locational price signals Medium to high complexity Carried forward for more assessment
3. Common standards	Group major assets that face the same or similar standards into a common DSP, such as multiple treatment plants in the same region with common licence requirements	Potential for good locational price signals, may involve some cross-subsidies Low to medium complexity Carried forward for more assessment
4. Administrative boundaries	Group assets that fall within the same administrative boundaries, such as Local Government Area boundaries or the 'Cities' model used by the Greater Cities Commission	Potential for good locational price signals, depending on which boundaries are chosen Medium to high complexity as boundaries may not align with underlying system hydraulics Carried forward for more assessment
5. Broad-based charge	A common charge that applies to all development in all locations	Limited to no locational price signal, many cross-subsidies Very low complexity Carried forward for more assessment

It is possible to 'mix-and-match' from these broad concepts between our different services.

For example, we might prefer a broad-based charge for drinking water, recognising the homogenous nature of the product and the interconnected supply system, while choosing to send locational price signals for wastewater or stormwater where standards and costs are more likely to vary between areas.

4.2.1 Pre-exhibition engagement on DSP concepts

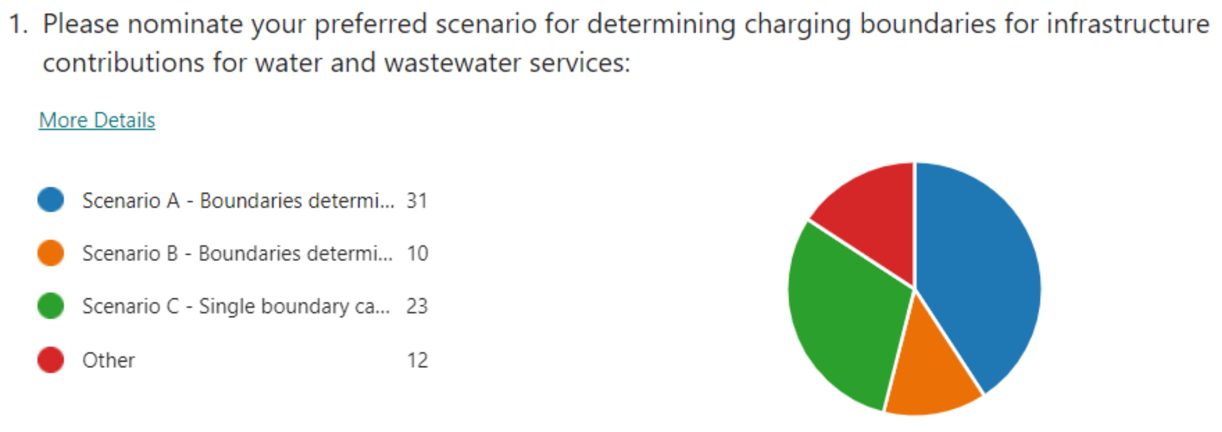
Between 15 August and 9 September 2022, we sought feedback on three of the short-listed DSP concepts with a campaign targeted to developers.

The concepts covered in our engagement included concept 2 and concept 5 from **Table 4-1** as these represent feasible 'bookends' on a spectrum of cost-reflectivity vs simplicity. The goal of the engagement was to try and determine where stakeholders landed on this spectrum. Concept 4 was added as a possible middle-ground, with some degree of locational price signal while minimizing the number of DSP areas.

Our engagement included an online survey about the DSP concepts, with an opportunity for free text responses for respondents to explain their choice. We also invited comments on infrastructure contributions more generally and held in-person briefings for some of the peak developer groups such as the UDIA and the Urban Taskforce.

Of the 77 responses survey received, around 40% preferred a granular approach (concept 2), 30% a simplified / single DSP (concept 5), and the remainder (30%) almost evenly split between a 'middle ground' or 'none of the above' (**Figure 4-1**). Of the concepts presented, a slight majority (53%) preferred a model with at least some degree of locational price signal.

Figure 4-1 Results of our online survey on DSP concepts



Note: scenario A is equivalent to concept 2 (system-based DSPs), scenario B is equivalent to concept 4, and scenario C is equivalent to concept 5 (single, broad-area DSP)

We acknowledge that responses may have been different if the scenarios had been based on forecasts of actual charges under each model, however these were not available when engagement started. Rather, we provided a range of indicative charges and areas that were plausible and consistent with early draft modelling results at the time.

We also received three written submissions, including the 'Spread the Base' option proposed by the UDIA and discussed earlier in this document. The UDIA model is most like concept 2, but with the addition of a common minimum charge that would be payable by all development in all areas (see section 2.3).

4.3 Assessment of DSP options

Our proposed DSP areas, 13 wastewater DSPs and four drinking water DSPs, are discussed below. In combination, we consider these areas will provide a meaningful price signal to guide development in our area of operations, without being overly complex.

4.3.1 Options we eliminated

As described in section 4.2.1, previous stakeholder engagement showed that concept 4, defining DSP areas to align with administrative boundaries, was the least preferred model.

While aligning DSP areas to Local Government Areas (LGAs) may have received more stakeholder support, a key limitation of concept 4 is that system boundaries and assets typically do not align very well with LGAs or other types of administrative boundaries.

There are also 37 LGAs within our area of operations, which is larger than the number of systems we operate. Conversely, there are only 4 areas under the Greater Cities Commission framework, far less than the number of systems. Implementation of this concept would therefore require many assumptions to allocate shared assets to the correct DSP area, significantly increasing complexity. The boundaries themselves are also typically not a strong driver of service standards or infrastructure costs, so any cost allocation method would be highly arbitrary. As a result, concept 4 was ultimately eliminated as a viable option.

4.3.2 Comparing DSP options and prices

Sending effective price signals about the cost of developing in different locations is a core aim of IPART's pricing method. We are obliged to implement IPART's method, including having regard to IPART's stated objectives (and any relevant objectives in our Operating Licence, such as not hindering competition).

While price signals are important, IPART has also noted that the infrastructure contribution framework should be simple to administer and applied consistently and transparently. We used several criteria (see also Appendix to help guide decisions about whether to amend any DSP areas, including:

- The scale of future development
- The magnitude of future investment
- The impact of merging on locational price signals
- The impact of merging on cost recovery.

In general, if the proposed merger of systems is assessed as having a low impact against these criteria, it is more likely to be acceptable. A proposed DSP combination may perform well on some criteria but not others, or impacts may all be clustered at one end of the spectrum (low impact, or high impact). In general, if impacts are towards the 'high impact' end of the scale then merging those systems would not produce good outcomes.

Drawing specific DSP boundaries is an iterative process, with a degree of trial and error needed in order to arrive at a final recommendation that achieves a reasonable outcome.

4.3.3 Drinking water DSP areas

While we operate 13 water delivery systems, more than 80% of drinking water is sourced via the Prospect Water Filtration Plant (WFP). New infrastructure is also being constructed to allow the Macarthur system to be served from Prospect if needed. We estimate that around 95% of development over the next 10 years will occur in this greater Prospect-Macarthur area.

In addition, most of the relevant service standards are common across systems, and planning for major supply augmentations is focussed on balancing demand and supply across the entire network.

As such, a broad-based charge is likely to be a suitable option for drinking water. We therefore compared a broad-based charge against the charges that might apply if we adopted 13 DSP areas to align with the 13 water delivery systems (see **Table 8-1** in Appendix 8.1). This analysis shows:

- Three water delivery systems do not require an infrastructure contribution, with new connections (around one-third of future growth) automatically providing sufficient revenue from normal retail prices to recover infrastructure costs
- Six delivery systems have a very similar infrastructure charge ($4,000 to $7,000 per ET), covering nearly 60% of anticipated development
- Four delivery systems would require a much higher contribution ($12,000 to $24,000 per ET) but cover less than 2% of future development (about 450 lots a year on average).

This analysis suggests limited benefit in creating many different drinking water DSP areas, particularly as the higher cost areas represent a tiny fraction of expected development. Indeed, while the level of investment is relatively material in some systems, the infrastructure contribution price does not vary to the same degree. When combined into a larger DSP area, the weighted average price change is less than $200 per ET, suggesting minimal distortions to the locational price signal if these systems were merged into a larger DSP.

Our final DSP model for drinking water therefore consists of four DSPs: three DSPs representing the zero charge water delivery systems, and a single DSP that combines all remaining delivery systems.

Table 4-2 Final Drinking Water Infrastructure Contribution Prices, $2022-23

Development Servicing Plan	1 July 2024 to 30 June 2025	1 July 2025 to 30 June 2026	From 1 July 2026
Greater Sydney Drinking Water	$820.46	$1,640.93	$3,281.85
Potts Hill Drinking Water	$0	$0	$0
Prospect East Drinking Water	$0	$0	$0
Illawarra Drinking Water	$0	$0	$0

Source: Sydney Water calculations. Prices are indexed each financial year by the Consumer Price Index

Final drinking water development servicing plan areas

4.3.4 Wastewater DSP areas

Unlike the drinking water network, wastewater performance standards vary considerably across our area of operations (see, for example, section 3.2), and this can drive very material differences in costs (both up-front capital and on-going operating costs).

A single wastewater DSP would have a price of $4,322 per ET. Although such a price is likely be seen as affordable and acceptable to most developers, it removes any regional difference in price despite underlying differences in cost. Importantly, the impact on locational price signals is rated as 'high' (>$10,000 per ET) for seven wastewater systems and three of our exhibited DSP areas, indicating that the change in price signal under a common wastewater charge would represent a significant distortion of the market. We have therefore discarded a broad-based DSP area as an option for wastewater.

In a previous implementation of IPART's method, each wastewater treatment plant (and its associated catchment) was a separate DSP area, and some larger catchments were also split into sub-catchments that each formed a separate DSP area. However, in hindsight, the creation of numerous DSPs (more than 40 in total) did not always enhance the locational price signal (most sub-catchments had a zero price) and only added to the perceived complexity of the framework.

For the current implementation, we have sought to achieve a better balance of simplicity vs price signals. Our preferred model is to group systems with similar environmental standards into the same DSP areas (ie, concept 3), which resulted in 10 wastewater DSP areas for the purposes of public exhibition.

Specifically, we grouped individual wastewater systems into the same DSP area where:

- each system discharges to the same reach of the Hawkesbury Nepean River and the EPA has set licence limits that apply collectively to those systems (see **Table 3-3**);
- for systems that ultimately discharge to the ocean, group areas if the level of treatment is the same (eg, all primary treatment plants), and/or the discharge environment is similar (eg, ocean-based plants in the Illawarra vs plants in Sydney).

In some cases, the amalgamation of systems has already begun, with investments planned or underway to link and/or rationalise wastewater treatment at:

- Richmond and North Richmond, by decommissioning the latter treatment centre;
- Castle Hill and Rouse Hill (as part of the North West Hub program); and
- Picton, Wilton and Upper Nepean (in the Greater Macarthur area).

Proposal submitted to IPART on 31 August 2023

Our final proposal departed from the standards-based approach in three key areas:

1. We removed the West Camden sewerage treatment system from the scope of the Greater Macarthur Wastewater DSP to create a standalone DSP for the West Camden system. Retaining the DSP as exhibited the DSP would significantly dilute and distort the locational price signal for a very substantial level of planned investment.
2. We decided to change the Sydney Coastal Wastewater DSP compared to the exhibited materials, which was a combination of the Bondi, Malabar and North Head wastewater systems. Using the revised set of development forecasts and ET calculation, the overall DSP price dropped to zero despite significant investment occurring in both the North Head and Malabar systems. On a standalone basis, however, both North Head and Malabar would have a non-zero price, indicating that investment costs are above average and a contribution is needed from developers. We proposed to create separate DSPs for each of these systems.
3. We are expecting material greenfield development and significant investment in parts of the Illawarra, including growth precincts that will connect to the existing Wollongong wastewater catchment. To provide cost-reflective prices that align with IPART's method, we have split the Wollongong system into:
    a. greenfield-focussed areas to the south and west of Wollongong, such as West Dapto, and
    b. predominantly infill areas to the north where, due to negative demand, the infrastructure contribution price for new wastewater connections will be zero.

Changes to the DSP design approach made after our submission of 31 August 2023

For the past few years, Sydney Water has facilitated the early release of land in the Greater Macarthur (and elsewhere in Sydney) by allowing development to use spare capacity in adjacent networks. This is a form of interim servicing we often allow, particularly in situations where the long-term servicing strategy for an area has either not been developed and/or where the assets needed under that long-term strategy have not been commissioned.

While we have followed this practice for many years, IPART's 2018 determination did not explicitly address the issue of how to correctly set infrastructure contribution prices in these situations. The method we adopted for the exhibition period was to place land inside the DSP that contained the long-term wastewater treatment solution for that area. In other words, development pays for the assets needed under the long-term servicing strategy, even if they are temporarily served by assets in another system for several years.

However, this approach may overstate the cost of allowing development to connect to our network in situations where the servicing strategy makes use of unused capacity.

The alternative we have adopted is to allocate land to the DSP that will provide that land with wastewater treatment services over the full five-year life of the DSP. However, developers will also be required to make a contribution towards the cost of infrastructure that is needed to activate the long-term servicing strategy for the surrounding region, given their development does influence the timing of that future investment. Our methodology for determining this contribution is set out in section 6.4.2.

Sydney Water has adopted this revised approach to the design of DSP areas, as it should send a more appropriate price signal in situations involving interim servicing between different wastewater systems.

Final wastewater DSP areas

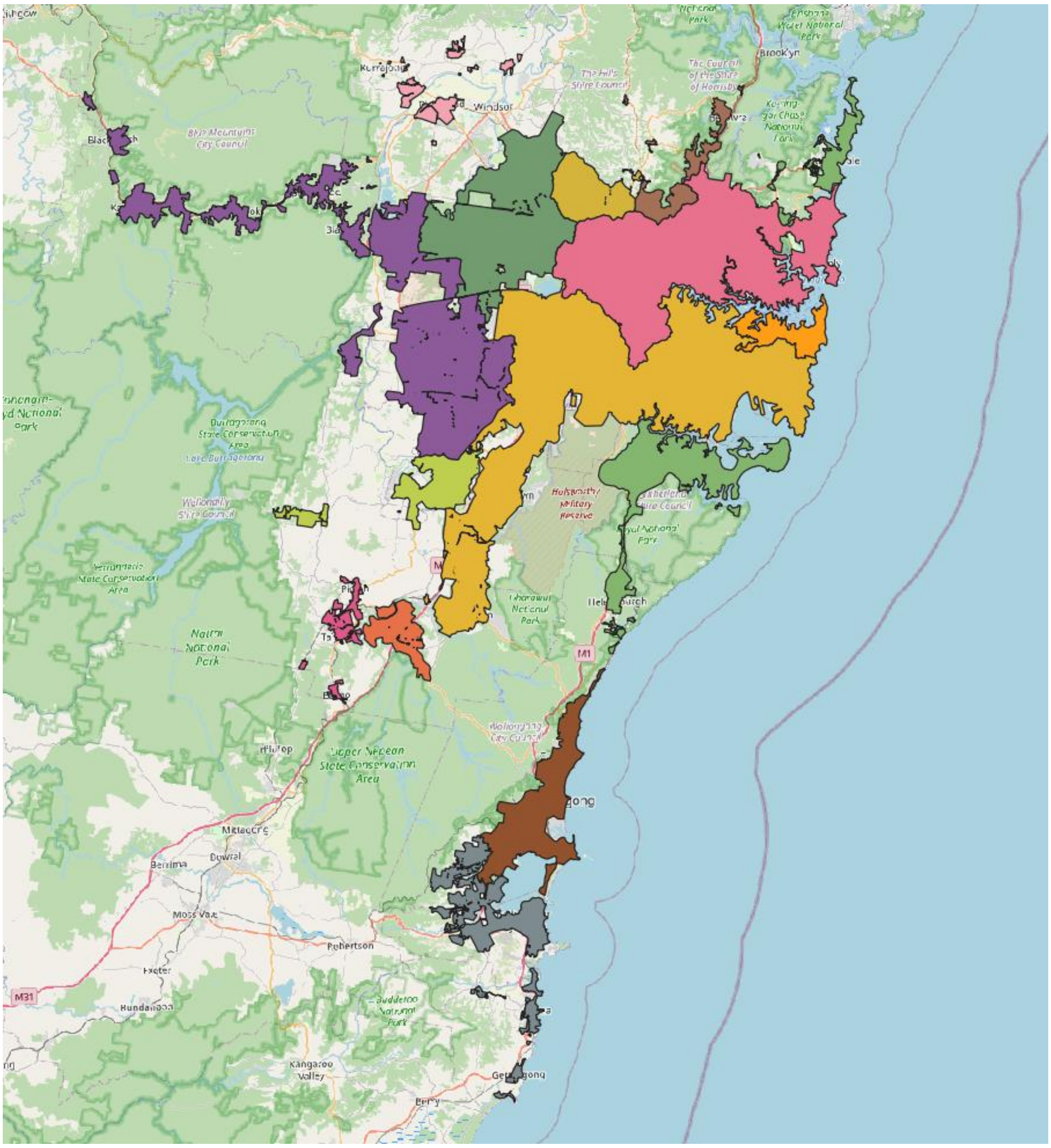
The list of final DSP areas and associated prices is shown in **Table 4-3**. The table is sorted based on our forecasts of future development over the next 10 years, such that areas with the highest forecasts are listed first and areas with the lowest forecast of development are listed at the bottom.

Table 4-3 Proposed Wastewater Infrastructure Contribution Prices, $2022-23

Development Servicing Plan	1 July 2024 to 30 June 2025	1 July 2025 to 30 June 2026	From 1 July 2026
Picton Wastewater	$10,182.22	$20,364.43	$40,728.87
West Camden Wastewater	$1,198.88	$2,397.75	$4,795.50
Wilton Wastewater	$5,541.74	$11,083.49	$22,166.97
Nepean River Wastewater	$4,005.10	$8,010.20	$16,020.40
Richmond Wastewater	$5,344.51	$10,693.52	$21,387.03
Lower South Creek Wastewater	$1,545.83	$3,091.66	$6,183.32
Norwest Wastewater	$990.40	$1,980.79	$3,961.58
Berowra Creek Wastewater	$1,620.53	$3,241.06	$6,482.12
Bondi Wastewater	$0	$0	$0
Malabar Wastewater	$201.18	$402.36	$804.72
North Head Wastewater	$146.95	$293.90	$587.79
Outer Sydney Coastal Wastewater	$595.43	$1,190.85	$2,381.70
Southern Illawarra Wastewater	$3,358.50	$6,716.99	$13,433.98
Northern Illawarra Wastewater	$0	$0	$0

Source: Sydney Water calculations. Prices are indexed each financial year by the Consumer Price Index

Table 8-2 in section 8.2 compares our proposed areas and prices against a more detailed or system-based approach.



Final wastewater development servicing plan areas (November 2023)

DSPs are reviewed every five years, and the design of areas can be updated based on new circumstances that may arise in the future.

4.4 Combined water and wastewater infrastructure charges

In combination, we consider our final wastewater DSP areas will provide a meaningful price signal to guide development in our area of operations, without being overly complex.

Most developments will require drinking water and wastewater and will therefore be required to pay an infrastructure contribution for each of these services. **Table 4-4** shows indicative total charges based on feasible combinations of overlapping wastewater and drinking water DSP areas. For example, the total amount payable by a development in the Malabar Wastewater DSP area depends on whether drinking water is sourced from Potts Hill, Prospect East or a different water delivery system.

Table 4-4 Indicative Combined Infrastructure Contribution Prices from 2026-27, $2022-23

Wastewater DSP	Matching Water DSP(s)	Combined Price# ($ / ET)
Malabar Wastewater	Potts Hill Prospect East Greater Sydney	$805 $805 $4,087
North Head Wastewater	Potts Hill Prospect East Greater Sydney	$588 $588 $3,870
Lower South Creek Wastewater	Greater Sydney	$9,465
Nepean River Wastewater	Greater Sydney	$19,302
Bondi Wastewater	Potts Hill	$0
Norwest Wastewater	Greater Sydney	$7,244
Southern Illawarra Wastewater	Illawarra Greater Sydney	$13,434 $16,716
Outer Sydney Coastal Wastewater	Potts Hill Greater Sydney	$2,382 $5,664
West Camden Wastewater	Greater Sydney	$8,077
Berowra Creek Wastewater	Greater Sydney	$9,764
Wilton Wastewater	Greater Sydney	$25,449
Picton Wastewater	Greater Sydney	$44,011
Richmond Wastewater	Greater Sydney	$24,669
Northern Illawarra Wastewater	Illawarra	$0

Around 77% of housing development over the next 10 years will pay a total contribution of less than $10,000 per ET. Prices ranges from $0 to $5,600 in areas dominated by infill development and where investment costs are lower. Charges are higher in greenfield areas and more remote parts of the networks, mainly reflecting the extensive infrastructure typically required for greenfield development as well as higher treatment standards in sensitive inland waterways.

4.5 Developing land outside DSP areas

Our DSP boundaries reflect anticipated medium-term growth in the demand for our services and infrastructure that will be delivered in accordance with our *Growth Servicing Plan* (GSP)[14]. As noted above, this can mean some land will have a drinking water DSP in place, but no corresponding wastewater DSP.

The absence of a DSP does not necessarily preclude that land being developed and being provided with a connection to our networks.

A developer can opt to independently fund infrastructure to accelerate planning and construction and can apply to the NSW Government to bring forward the release of precincts for development. If the government approves the proposal, we'll work with the proponent to establish a commercial agreement. This will outline financial arrangements and determine the best way to plan and deliver services.

Our *Funding Infrastructure to Service Growth* policy provides more information about funding of accelerated development and conditions for reimbursement[15].

In most cases, it is likely the infrastructure contribution required will be the price that applies in the DSP area where drinking water will be sourced for the development, and the charge in the DSP area that will accept wastewater from the development.

[14] https://www.sydneywater.com.au/plumbing-building-developing/developing/growth-servicing-plan.html
[15] https://www.sydneywater.com.au/content/dam/sydneywater/documents/funding-infrastructure-to-service-growth.pdf

5 Equivalent Tenements

The infrastructure contribution price is the amount that must be paid by one equivalent tenement (ET). IPART's 2018 determination defines one ET as being equal to the annual total demand of an average detached, single residential dwelling, but provides no further definition of 'demand'.

IPART also decided not to specify any values for an ET in our 2020 price determination, essentially leaving this as something to be calculated if needed in the future.

The intent of IPART's method is that costs are shared based on the relative demand for our services from each new connection. We have adopted a volume-based approach to defining demand for our services:

- Demand for drinking water is measured in kilolitres of drinking water taken per year;
- Demand for wastewater is measured in kilolitres of wastewater discharged per year; and
- Demand for stormwater is measured as kilolitres of stormwater discharged per year, which is a function of land area (gross property area, in hectares) regardless of specific land use (ie, residential vs non-residential).

To calculate an infrastructure contribution price, the total number of ETs each year is the sum of:

1. The number of new single residential dwellings, where one dwelling is one ET (by definition); and
2. The number of new dwellings in multi-unit residential lots (eg, apartments), converted to ETs based on the difference in annual volume compared to a single residential dwelling; and
3. The total annual volume of new non-residential lots, converted to ETs based on the difference in annual volume compared to a single residential dwelling.

The 2018 Determination requires that we use location specific data where available[16], as opposed to Sydney-wide averages.

5.1 Historical ETs

Where our historical data series shows negative values for certain inputs, we have set the number of incremental ET's for that period to zero.

In almost every system, our historical data shows a reduction in non-residential demand over time, which may reflect a range of different factors. For example, it is possible that demand has simply fallen in line with more water-efficient technology. Alternatively, the change may reflect changes in land use, with the departure of heavy industry and other large water-users, and their replacement with light industrial, commercial or residential development.

In a smaller number of cases, our historical data also shows net decreases in the number of connected properties.

[16] See, for example, Schedule 5, clause 5(b)

5.1.1 Drinking water ETs 1996 to 2022

By definition, a single residential dwelling is one ET. For the single residential category, the number of growth ETs each year is therefore just the change in the total number of single residential properties at the end of each financial year compared with the total number connected as at the end of the previous year[17].

For dwellings in multi-unit properties, we calculate the change in dwellings in the same way – that is, the number of properties at the end of a year, minus the number at the end of the previous year. However, we must then convert the number of multi-unit dwellings to the equivalent number of single dwellings. We do this by comparing average annual water use between the two types of properties.

We have selected the five-year period between 2011-12 and 2016-17 as being representative of historical 'normal' water use, as this was a period less affected by extreme climate variances (ie, drought or high rainfall). We use the ratio of single to multi-unit residential average water use to convert multi-unit properties to ETs. For example, if apartments use 70% of the water of a single house, then one new apartment is 0.7 ET. If there were 10,000 new multi-unit connections in this DSP area, the infrastructure price would use 7,000 ETs as an input.

Table 5-1 shows historical average water use for each drinking water DSP area, which are a weighted average of the equivalent figures for the individual drinking water delivery systems forming each DSP area. These figures represent a simple average across all properties, and therefore do not distinguish between developments of different densities. When it comes time to pay an infrastructure contribution price during the Section 73 process, a site specific density will be applied and this will likely differ from the average figures noted in the table below.

Table 5-1 Average annual water consumption by DSP area (kilolitres), 2011-12 to 2016-17

Drinking water DSP	Single residential	Multi-unit residential	Multi:Single
Greater Sydney	156.8	90.7	0.58
Illawarra (established areas)	180.9	117.5	0.65
Potts Hill	214.9	141.2	0.66
Prospect East	221.4	170.5	0.77

Source: Sydney Water analysis of metered water consumption

In the case of non-residential development, growth is measured as the change in total annual water consumption across all non-residential property types, not the change in the number of properties. We divide the total non-residential volume in each DSP area by the average volume of a single residential dwelling as per **Table 5-1** to convert non-residential volume to ETs.

5.1.2 Wastewater ETs 1996 to 2022

Like drinking water, one wastewater ET is, by definition, equal to the annual volume of wastewater discharged by a single, detached residential dwelling. The number of growth ETs each year is

[17] As per the 2018 Determination, we measure growth ET's from 1 January 1996. The number of growth ETs for 1995-96 is therefore equal to 50% of the change in properties compared to 1994-95.

therefore just the change in the total number of single residential properties with a wastewater connection at the end of each financial year compared with the total number connected as at the end of the previous year.

For dwellings in multi-unit properties, we calculate the change in dwellings in the same way – that is, the number of properties with a wastewater connection at the end of a year, minus the number at the end of the previous year.

However, we must then convert the number of multi-unit dwellings to the equivalent number of single dwellings. We do this by comparing average annual water use between the two types of properties, and assuming 75% of drinking water used is discharged to a wastewater system (see **Table 5-2**). As noted above, when it comes time to pay an infrastructure contribution price during the Section 73 process, a site specific density will be applied and this will likely differ from the average figures noted in the table below.

The 75% wastewater discharge factor is currently used when IPART sets retail water prices for both single and multi-unit residential properties, even though most water use in apartments is indoors and it is likely that a greater share of water would be discharged to the wastewater system. Given IPART's intention that infrastructure contributions work in tandem with the setting of retail prices, we have adopted the default wastewater discharge factor when calculating infrastructure contribution prices.

For non-residential development, growth is measured as the change in total annual wastewater discharge volume across all non-residential property types, not the change in the number of properties. While we directly measure wastewater volumes for larger non-residential properties, this is not the case for smaller non-residential connections.

The annual volume of non-residential wastewater discharge is calculated as total non-residential drinking water use multiplied by an average wastewater discharge factor of 80.5%. The wastewater discharge factor is an average across all non-residential property types, as it was considered impractical to use actual discharge factors for each non-residential property.

Once we have calculated non-residential wastewater volume in each DSP area, we divide by the average discharge volume of a single residential dwelling as per **Table 5-2** to convert non-residential volume to ETs.

Table 5-2 Average annual wastewater discharge by DSP area (kilolitres), 2011-12 to 2016-17

Wastewater DSP	Single residential	Multi-unit residential	Multi:Single
Picton Wastewater	144.1	86.7	0.60
West Camden Wastewater	157.7	115.5	0.73
Wilton Wastewater#	144.1	86.7	0.60
Nepean River Wastewater	145.3	93.7	0.64
Richmond Wastewater	150.8	85.1	0.56
Lower South Creek Wastewater	162.5	126.1	0.78
Norwest Wastewater	186.8	149.7	0.80
Berowra Creek Wastewater	160.7	120.0	0.75
Bondi Wastewater	157.2	130.7	0.83
Malabar Wastewater	169.2	126.9	0.75
North Head Wastewater	176.2	121.5	0.69
Outer Sydney Coastal Wastewater	166.1	104.8	0.63
Southern Illawarra Wastewater	132.9	84.2	0.63
Northern Illawarra Wastewater	137.2	88.9	0.65

Source: Sydney Water analysis of metered water consumption

Wilton demand assumed equal to historical Picton demand, as there is limited historical data for this system

5.1.3 Historical stormwater ETs

There are no stormwater DSPs at this time.

However, previously, we defined stormwater ETs as being proportional to the net developable area of a property. This is a consistent with how other stormwater infrastructure contributions are levied (eg. Council s7.11 contributions). We anticipate our new greenfield stormwater DSPs will continue to use a net developable area-based definition for ETs.

5.2 Forecasting future demand for new connections

Forecasts of new demand for our services reflect intelligence known to Sydney Water, which is sourced from:

- published government data (eg, the Housing Supply Forecast Monitor or HSFM),
- Section 78 development referrals[18],
- precinct-specific forecasts provided by the Department of Planning and/or local councils,
- development- or site-specific information obtained directly from our developer customers.

Our forecasts cover both residential and non-residential development.

Given the variety of data sources we use, the consolidated forecast is very dynamic. A snapshot of the data was taken in early December 2022, and this has been used as the basis of our infrastructure contribution prices. In terms of major inputs, the forecast we have adopted to calculate infrastructure contribution prices reflects:

- Sydney Housing Supply Forecast 2021 (issued by DPE in 2022)
- Transport for NSW employment forecasts published in 2019.

5.2.1 Residential vs non-residential forecasts

Forecasts of residential development show the expected number of dwellings.

Unlike the residential sector, however, the number of new non-residential properties is not necessarily a good predictor of the underlying demand for our services. For example, a large commercial building may have several hundred employees, and industrial properties may use production processes that require large volumes of water. In each case the total demand for our services would be many times that of a single residential dwelling, but the property itself may only have one or two physical connections to our systems.

The non-residential sector is also highly diverse, with many different types of potential land uses and different levels of demand for our services. While land zoning can sometimes provide a guide to future land uses, in most cases Sydney Water will not know actual land use until we receive an application for a new connection (and, even then, this can change in the future). However, we must still make forecasts of future demand to support infrastructure planning and infrastructure contribution pricing.

Our forecasts of non-residential demand are based on employment forecasts prepared by Transport for NSW, who use location-specific information to help plan the demand for different transport modes across Greater Sydney. As noted above, we may also supplement employment forecasts with estimates of demand from known development proposals.

[18] Under Section 78 of the Sydney Water Act, consent authorities such as the Department of Planning and local councils must refer impactful development applications to Sydney Water. These referrals alert Sydney Water to upcoming development and any potential impacts to our assets.

5.3 Future ETs

5.3.1 Future drinking water ETs

By definition, a single residential dwelling is one ET. For the single residential category, the number of growth ETs each year is therefore equal to the total number of new single dwellings in each financial year.

For dwellings in multi-unit properties, our forecast also includes the number of additional dwellings each financial year. We must then convert the number of multi-unit dwellings to the equivalent number of single dwellings. We do this by comparing average annual water use between the two types of properties. Unlike historical ETs, which converted dwellings to ETs based on historical water use, for forecast ETs we use estimates of future water demand.

Sydney Water uses a demand forecasting approach endorsed by IPART and industry experts, which employs sophisticated panel data econometric techniques. Our demand forecast assumes that all new dwellings must meet BASIX requirements for the installation of water saving measures. We also assume average weather conditions; however, our models do account for the long-term impact of climate change on average conditions into the future (derived from NARCLIM regional climate change projections).

Table 5-3 shows historical average water use for each drinking water DSP area, which are a weighted average of the equivalent figures for the individual drinking water delivery systems forming each DSP area.

Table 5-3 Forecast average annual water consumption by DSP area (kilolitres)

Drinking water DSP	Single residential	Multi-unit residential	Multi:Single
Greater Sydney	156.8	90.7	0.58
Illawarra (established areas)	180.9	117.5	0.65
Potts Hill	214.9	141.2	0.66
Prospect East	221.4	170.5	0.77

Source: Sydney Water analysis

In the case of non-residential development, growth is measured as the change in total annual water consumption across all non-residential property types, not the change in the number of properties. To forecast non-residential drinking water use, we use the forecast of additional employment and assume that each new employee will use an average of 65 litres of water per day. We then divide the total non-residential volume in each DSP area by the average volume of a single residential dwelling as per **Table 5-3** to convert non-residential volume to ETs.

5.3.2 Future wastewater ETs

Like drinking water, one wastewater ET is, by definition, equal to the annual volume of wastewater discharged by a single, detached residential dwelling. The number of growth ETs each year is therefore the total number of new single residential properties with a wastewater connection each financial year.

For dwellings in multi-unit properties, we calculate the change in dwellings in the same way – that is, the number of new properties with a wastewater connection each year. However, we must then convert the number of multi-unit dwellings to the equivalent number of single dwellings. We do this by comparing average annual water use between the two types of properties, and assuming 75% of drinking water used is discharged to a wastewater system (see **Table 5-4**).

The 75% wastewater discharge factor is currently used when IPART sets retail water prices for both single and multi-unit residential properties, even though most water use in apartments is indoors and it is likely that a greater share of water would be discharged to the wastewater system. Given IPART's intention that infrastructure contributions work in tandem with the setting of retail prices, we have adopted the default wastewater discharge factor when calculating infrastructure contribution prices.

For non-residential development, growth is measured as the change in total annual wastewater discharge volume across all non-residential property types, not the change in the number of properties. While we directly measure wastewater volumes for larger non-residential properties, this is not the case for smaller non-residential connections.

The annual volume of non-residential wastewater discharge is calculated as total non-residential drinking water use multiplied by an average wastewater discharge factor of 80.5%. The wastewater discharge factor is an average across all non-residential property types, as it was considered impractical to use actual discharge factors for each non-residential property.

Once we have calculated non-residential wastewater volume in each DSP area, we divide by the average discharge volume of a single residential dwelling as per **Table 5-4** to convert non-residential volume to ETs.

Table 5-4 Forecast annual wastewater discharge by DSP area (kilolitres)

Wastewater DSP	Single residential	Multi-unit residential	Multi:Single
Picton Wastewater	121.9	66.2	0.54
West Camden Wastewater	128.1	88.1	0.69
Wilton Wastewater	121.9	66.2	0.54
Nepean River Wastewater	137.5	92.7	0.67
Richmond Wastewater	129.6	73.2	0.56
Lower South Creek Wastewater	130.5	91.0	0.70
Norwest Wastewater	154.2	116.9	0.76
Berowra Creek Wastewater	132.6	92.3	0.70
Bondi Wastewater	130.0	105.0	0.81
Malabar Wastewater	139.5	101.7	0.73
North Head Wastewater	145.7	97.6	0.67
Outer Sydney Coastal Wastewater	113.9	83.3	0.60
Southern Illawarra Wastewater	116.1	71.1	0.62
Northern Illawarra Wastewater	116.1	73.8	0.64

Source: Sydney Water analysis of metered water consumption

6 Assets

IPART's pricing method only allows Sydney Water to recover the costs of infrastructure where there is a nexus to development. That is, the need for investment is due to an increase in demand for our services – in other words, but for the increase in demand we would not need to invest.

6.1 Excluded assets

IPART's 2018 Determination requires[19] that the following assets must be excluded from a DSP area:

a) that part of an asset provided for a reason other than to service a growth area;

b) that part of an asset that services other DSP Areas;

c) the capacity of an asset that was made available by changes in land use patterns, or by changes in average demand;

d) any asset or part of an asset that was unreasonably oversized relative to system and capacity requirements, based on available demographic data at the time it was commissioned;

e) any Pre-1970 Assets; and

f) any asset or part of an asset funded by Developers and transferred free of charge to the Agency.

In addition, IPART has specified several principles that apply when deciding what assets are included in the price calculation. For example, Schedule 5, clause 2.4(d) provides that:

> *Where:*
>
> *(1) an Agency temporarily supplies services to a Development from an existing Asset; and*
>
> *(2) the Agency transfers the supply of services to the Development from the existing Asset to the new Asset that has just been commissioned;*
>
> *then only the costs of the new Asset may be included in calculating maximum prices under this determination.*

We have reviewed our asset information to ensure we have excluded all assets that must be excluded. For example, we intend to decommission certain assets in the North Richmond Wastewater system and transfer flows to a new facility. While the existing North Richmond assets will continue to provide services for a short period of time, we have excluded assets that will be decommissioned from the infrastructure contribution calculations in line with the capital charge principles set by IPART.

Table 6-1 shows various other asset types that have been excluded because they do not have a clear nexus to development.

[19] Schedule 7, definition of Excluded Assets.

Table 6-1: Example of certain excluded water assets

Asset description	Reason for Exclusion
Fire service	Not a service standard Sydney Water is required to meet, no nexus to growth
Bypass	Unclear nexus to growth
Cross-connection	Unclear nexus to growth Negligible length (constitutes 4.5 km out of 3,500 km)

6.1.1 Sydney Desalination Plant

In the report[20] accompanying IPART's 2018 Determination, IPART noted that it had decided that all Sydney Desalination Plant (SDP) assets must be excluded for the purposes of calculating an infrastructure contribution. IPART considered that the SDP assets would not meet the 'nexus to development' test, given the plant was conceived and operated as a drought response measure.

IPART's report also noted that SDP may need to be treated as a 'headworks' asset, and therefore be eligible for inclusion in an infrastructure contribution price, if the operating rules were altered and the plant became a permanent source of water supply.

As set out in the 2022 Greater Sydney Water Strategy (GSWS), SDP's licence arrangements will be amended so that SDP can operate on a full-time, flexible basis. Once the new licence comes into effect, which is expected to occur from 1 July 2023, the volume of water that SDP must produce each year will be determined by Sydney Water using a Decision Framework approved by our Portfolio Minister.

The decision to operate SDP in a more flexible way occurred in the context of a material reduction in the sustainable yield[21] of the drinking water system, which was revised down from 570 GL in 2017 to 535 GL in mid-2020 based on analysis of updated hydrological data following the 2017-2020 drought.

The updated yield estimate was lower than actual demand in 2016-17 (557 GL), 2017-18 (598 GL) and 2018-19 (567 GL), and only marginally above demand in 2019-20 (533 GL).

The move to full-time, flexible operation provides an overall improvement in system yield of around 20GL, partly offsetting the gap that became evident following the 2017-2020 drought. Although SDP will now operate on a 'full-time' basis, the new decision framework retains a strong focus on

[20] IPART (2018) *Final report – maximum prices to connect, extend or upgrade a service for metropolitan water agencies,* p 33.
[21] The yield of the water supply system is the maximum amount of water that can be supplied annually on a sustainable basis. WaterNSW uses the Water Headworks Network (WATHNET5) software package to simulate the operation of the water supply system and assess system yield, a function conferred on them by the *Water NSW Act*.

managing the impact of drought on dam storage levels and avoiding dam spills when water is more plentiful.

Given this context, Sydney Water considers that SDP would still not pass the nexus to development test and has therefore decided to continue excluding SDP's assets from the calculation of infrastructure contributions.

6.1.2 Potential supply augmentation investments under the GSWS

As noted above, the 2017-2020 drought led to a material revision to the sustainable yield of the drinking water supply system. The GSWS took an 'all options on the table' approach to water planning, and committed to a range of actions including:

- investing in water conservation and efficiency programs,
- optimising the operation of SDP, and
- planning for new rainfall-independent supply (RFIS) options.

Although total demand has been within system yield over the past two financial years, Sydney Water has continued to investigate various supply augmentation portfolios to align with, and respond to, the water security and resilience risks and priorities identified in the GSWS.

A final recommendation regarding a preferred portfolio is yet to be considered by the NSW Government. Given uncertainty regarding the nature, timing and magnitude of future investments, we have not included the costs of any water supply augmentation measures when calculating infrastructure contribution prices for this round of DSPs. This can be revisited once a business case has been considered and approved by Government, at which point we can update our drinking water DSP prices to reflect any approved investments with a nexus to development.

6.2 Commissioned assets

IPART's infrastructure contribution pricing method requires[22] that all commissioned assets must be valued using a valuation method known as the Modern Engineering Equivalent Replacement Asset (MEERA), with values taken from an asset register or some other source acceptable to IPART.

Importantly, the use of MEERA values means the price is not based on the amount originally invested by Sydney Water, (although there should often be a good correlation, particularly for more recent assets). Instead, we must develop a cost estimate for a notional asset that replicates the service already provided by us but instead uses the most efficient solution available given today's technology. The development of MEERA values is therefore an engineering process, and Sydney Water would have typically completed a new MEERA valuation for discrete asset classes on a rolling five-year basis. In the past, MEERA values were used for statutory accounting purposes as a proxy for the total value of our asset base. However, accounting standards now use alternative concepts such as the Cash Generating Unit Test (CGUT), which values assets based on their ability to earn revenue – in Sydney Water's case, the amount of revenue we can recover through regulated prices.

[22] See Schedule 5, clause 2.1(a).

The change in accounting standards, combined with the decision to set infrastructure contribution prices to zero in 2008, means there hasn't been a compelling need to continue with periodic MEERA updates at the asset class level. While some MEERA-style assessments have been completed for specific assets, there has not been a general asset-class MEERA valuation update since 2016.

For the current round of DSPs, we have relied on any existing MEERA valuations and applied indexation adjustments to convert these historical values to $2022-23 compared to the applicable base year.

The reintroduction of infrastructure contributions will prompt a restart of rolling MEERA reviews, and we expect most asset values will be updated prior to the five-yearly review of DSPs required by IPART's 2018 Determination.

6.2.1 1970 – 2006 commissioned assets

The most recent set of DSPs was published in 2006 and included details of commissioned assets in each DSP area. As this information had been the subject of public exhibition and accepted by IPART, we have retained the list of assets from the 2006 DSP documents and applied indexation adjustments to convert values to $2022-23.

6.2.2 Post-2006 commissioned assets

Data was sourced from the Fixed Asset Register to generate a list of assets with an acquisition date on or after 1 December 2005, which was the cut-off used in the previous DSPs.

The data was interrogated and verified against other available data (eg, business cases) to ensure we only capture assets with a nexus to development and removed any other assets that fall within the definition of excluded assets set by IPART. Key data verification activities included:

- Cross-referencing data in the fixed asset register against the original business case or relevant planning documents
- Reviewing financial reports to confirm Sydney Water funding for developer-delivered reticulation
- Sense checking of values (eg, understanding negative values)
- Developing a decision process for investments with multiple drivers (eg, wet weather overflows)

Indexation adjustments were applied to convert values to $2022-23.

6.3 Uncommissioned assets

IPART's infrastructure contribution pricing method requires[23] that uncommissioned assets must be valued at their efficient cost, which IPART notes is essentially equivalent to MEERA values[24].

[23] See Schedule 5, clause 2.1(a).

Section 3 of this report describes the service standards we are required to meet, and the performance criteria we typically use to assess whether our existing assets can cater for current and project demand.

Our planning process (see **Figure 6-1**) proceeds with an increasing level of detail as we gain more information about the size, location and staging of new development. Although we aim to identify the most efficient solution at each stage, the final solution that we ultimately deliver may differ from the solution identified in an earlier stage of planning.

Cost estimates will also be reviewed and updated at each stage, with increasing levels of confidence as we move towards physical delivery of assets (or other solutions).

6.3.1 Data sources for this round of DSPs

We have used the following data sources to identify future capital expenditure needed to meet new demand due to growth:

- Individual project or program business cases
- Growth Servicing Investment Plans (GSIPs)
- Long-Term Capital and Operating Plan (LTCOP)

Investments within the next five years will have some form of business case, with details such as the total cost and the anticipated year of asset commissioning – information needed as an input IPART's pricing method. For information about investments beyond the next five years, we must turn to other sources such as GSIPs and/or the LTCOP.

Our GSIPs represent a strategic assessment of our ability to cater for current and projected future demand. We identify gaps based on the latest growth projections and determine strategic solutions to meet performance criteria. However, we do not complete a detailed assessment[25] of options as part of the GSIP process.

As a result, our GSIP outputs have a degree of uncertainty about the value and timing of asset delivery. This is an important consideration for infrastructure contribution pricing, as asset values are supposed to be included in IPART's formula based on the year of commissioning. In most GSIPs, however, we are only able to identify timing in very broad terms – eg, asset 'x' won't be needed before 2031, but will be needed no later than 2041. For large value assets, a 10-year change in assumed timing could make a material difference to final prices.

For this round of DSPs, we have adopted the mid-point of the relevant range to represent the anticipated date of asset commissioning. If delivery of an asset started in an earlier year but is not yet commissioned, it was assumed the asset would be commissioned in 2022.

Because our GSIPs are based on more granular data about assets and forecast development, they are the primary data source for this round of DSPs.

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[24] IPART (2018) *Final Report – Maximum prices to connect, extend or upgrade a service for Metropolitan water agencies*, p 35

[25] That is, we do not consider more technical factors, such as the ideal location, route, staging or size of potential solutions. More detailed planning occurs as part of subsequent planning stages, such as options planning and concept design.

All GSIPs were reviewed in 2021 to see if there were any were material variances in the underlying assumptions compared to the previous round of GSIPs in 2016 and 2017. Each GSIP was only updated if there were material changes in key inputs, in particular key demographic data around future growth and therefore the magnitude and timing of future flows. As such, the modelling of infrastructure contribution prices uses a mix of 2017 and 2021 GSIPs.

Costs are assumed to be in equivalent dollars between GSIP versions, as the base unit costs in the cost estimating tool used by our asset planners had not been updated. This may ultimately lead to material differences in costs once we move into asset delivery, as the actual delivery cost will reflect construction costs at the time the asset goes to market for procurement. However, as noted elsewhere, future DSP prices for commissioned assets will reflect MEERA values rather than actual investment costs.

6.4 Apportionment of asset values to the right development

6.4.1 Past and historical development

On 23 September 2022, issued a clarification note regarding the calculation of the capital charge component in their 2018 infrastructure contribution pricing methodology (see Box 3 below).

Box 3: IPART clarification of approach to cost apportionment

A key objective of the developer charge method is to ensure that developers pay the full costs of capital works that are for the exclusive benefit of their development, and partially pay the costs of capital works already undertaken that benefit both their development and existing customers of the public water utility.

The capital charges in the pricing formula involve an apportionment of capital costs to a DSP. The portion assigned to each DSP will be based on expected utilisation (the number of ETs in the DSP as a proportion of the total number of ETs served by an asset).

The apportionment of costs will likely be different for each asset, and will certainly be different for assets of different categories (eg, pre-1996, 1996-present, future).

Utilities subject to the 2018 determination should not apply the same apportionment ratio to the different asset categories.

Source: IPART (2022) *Calculation spreadsheet example – developer charge clarification*

In effect, there are multiple levels of cost apportionment: (1) where an asset services multiple DSP areas, and (2) where an asset provides services to both past and future development, or only to future development.

For uncommissioned assets, we have applied a 100% cost apportionment factor. For example, if a $1 million asset will provide services to the Nepean River Wastewater DSP area, the full $1 million is used as an input to the infrastructure contribution price calculation.

If the uncommissioned asset is shared across more than one DSP area (known as headworks), costs have been apportioned to each relevant DSP based on their share of capacity used (as per

IPART's method, we measure capacity used based on ultimate or final demand). There were no wastewater headwork assets, but there are some drinking water headworks.

For commissioned assets, we must have regard to whether the existing asset provides a service to new development. To the extent that an asset services both existing customers and new development, we are required to exclude the portion that relates to existing customers. In our 2006 round of DSPs, this was implemented by calculating a 'capacity utilisation factor'.

For pre-1996 commissioned assets, the capacity utilisation factor was calculated as the total number of new ETs between 1970 and 1996, divided by the total number of ETs at the end of the forecast period (ie, both past and future ETs). For example, if there 30,000 ETs connected to our system between 1970 and 1996, and we forecast 60,000 total ETs by 2052, then 50% of capacity had already been utilised as at 1996. In this example, we would only count 50% of the value of a $1 million asset in our infrastructure contribution price calculation.

In our current implementation of IPART's methodology, we have taken the following approach:

- Pre-1996 commissioned assets: the apportionment factor is calculated as the total number of ETs between 1970 and 2022, divided by the total number of ETs in 2052.
- Post-1996 commissioned assets: the apportionment factor is calculated as the total number of ETs between 1996 and 2022, divided by the total number of ETs in 2052.
- Uncommissioned assets: 100% of asset values are included.

The apportionment of costs has been calculated for each category of assets (ie, pre-1996, 1996-2022, and future) for the entire DSP area, as it is not practical to apply an apportionment factor for each individual asset.

All else being equal, the proportion of commissioned assets included in infrastructure contribution prices should trend downwards over time as an area becomes more developed.

6.4.2 Interim servicing

For the past few years, Sydney Water has facilitated the early release of land in the Greater Macarthur (and elsewhere in Sydney) by allowing development to use spare capacity in adjacent networks. This is a form of interim servicing we often allow, particularly in situations where the long-term servicing strategy for an area has either not been developed and/or where the assets needed under that long-term strategy have not been commissioned.

While we have followed this practice for many years, IPART's 2018 determination did not explicitly address the issue of how to correctly set infrastructure contribution prices in these situations. The method we adopted for the exhibition period was to place land inside the DSP that contained the long-term wastewater treatment solution for that area. In other words, development pays for the assets needed under the long-term servicing strategy, even if they are temporarily served by assets in another system for several years.

However, this approach may overstate the cost of allowing development to connect to our network in situations where the servicing strategy makes use of unused capacity. The alternative we have adopted is to allocate land to the DSP that will provide that land with wastewater treatment services over the full five-year life of the DSP.

Under an interim servicing approach, we essentially create three groups of developers:

Group (1): Connect to system A (eg, Malabar) but transfer to system B (eg, Greater Macarthur) when system B is commissioned;

Group (2): Connect to system A and remain in system A permanently; and

Group (3): Connect to system B (in future) and remain in system B permanently.

The exhibited DSPs instead focussed on the long-term servicing solution. In other words, any lot that would eventually be served by system B was placed in the same DSP regardless of how they were served at the time of connection.

However, in practice, groups (1) and (2) are competing for the available spare capacity and, depending on the overall rate of new connections, both can therefore influence the timing of our investment. In other words, there is a clear nexus between their development and a resulting need for investment in new assets.

An economically efficient approach would be to send both groups the same price signal, recognising that they collectively determine the need and timing of investment even if only one group will ever actually use those assets permanently.

In the Greater Macarthur example, the least cost investment is our long-term servicing strategy which involves 'disconnecting' the region from the coastal wastewater system and instead treating and re-using wastewater locally. A price based on the full value of assets needed for the long-term servicing strategy would not be appropriate since, once such an asset has been commissioned, group (2) no longer influences the size or use of that asset. From that point, costs should only be shared between groups (1) and (3).

Importantly, the trigger for investing in the long-term asset is that demand has exceeded the level of spare capacity in the system. We can therefore apportion the cost of assets needed under the long-term servicing strategy based on the number of connected ET's at the date we expect the asset will need to have been commissioned given our development forecast. This means that developers in the short-term pay for two groups of assets: (1) assets needed to facilitate their connection; (2) their share of assets needed to activate the permanent servicing strategy.

For example, assume an asset worth $100m will be commissioned in 2032 to serve 100,000 ET's by 2052, and is needed to 'activate' the long-term servicing solution for the region. The commissioning date is the year we expect capacity in the interim servicing strategy will have been exhausted, equivalent to 30,000 ET's worth of demand. Therefore, we can say that 30,000 / 100,000 ET's x $100m = $30m is the asset value that should be used to help set an infrastructure contribution price in the short-term. As spare capacity can be taken up by either group (1) or group (2), both should face the same price signal using this asset value.

If there are multiple DSP areas that potentially influence the timing or value of assets under a long-term servicing strategy, then each of those DSPs should bear an allocation of the apportioned asset values. For example, in the case of Greater Macarthur, we know that the rate of growth in Wilton influences the date of commissioning of a new advanced water treatment facility in the region, which means developers in that area should face an appropriate price signal. Similarly, growth in Picton will have an influence on the decision to activate the long-term Greater Macarthur regional servicing strategy, and it is appropriate that developers in this system face a price signal.

Sydney Water has adopted this revised approach to the design of DSP areas, as it should send a more appropriate price signal in situations involving interim servicing between different wastewater systems.

Figure 6-1 Planning and delivery of new infrastructure to serve growth

Sydney Water process	Planning stages and timing of infrastructure	
Regional Planning	**Regional Planning** sets the long-term, high-level direction of Sydney Water's infrastructure plans including how they support the NSW Government's vision of three productive, liveable and sustainable cities. There are no timeframes for delivery and precinct asset needs are unknown. **Option to accelerate:** Developers can bring forward the Strategic Planning stage through a commercial agreement.	Low certainty
Strategic Planning	**Strategic Planning** identifies options for delivering integrated water and wastewater services to precincts, including recycled water, decentralised systems and potential connections to Sydney Water's existing network. There is a high-level pathway for delivering infrastructure but low certainty around delivery timeframes, asset locations and size. **Option to accelerate:** Broad timeframes for delivering infrastructure are provided on the maps (overleaf). Please contact us to discuss the commercial options available for guaranteeing a specific delivery timeframe.	
Options Planning	**Options Planning** identifies the preferred high-level servicing option and considers the ideal location, route, staging and size. Catchment boundaries are available once the options planning report is complete. Planning progresses to Concept Design when the land is rezoned. **Option to accelerate:** Broad timeframes for delivering infrastructure are provided on the maps (overleaf). Please contact us to discuss the commercial options available for guaranteeing a specific delivery timeframe.	
Concept Design	**Concept Design** determines asset locations, size, sequencing and specific delivery timeframes. There is high certainty of delivery timeframes and proposed asset maps are available when this stage is complete. **Option to accelerate:** The major factor influencing delivery timeframes is the time taken to build infrastructure. There is limited ability to accelerate delivery timeframes.	
Design and Deliver	**Design and Deliver** is when the infrastructure is built. There is very high certainty of timeframes. The proposed asset maps including sequencing, size and asset locations are available. **Option to accelerate:** The major factor influencing delivery timeframes is the time taken to build infrastructure. There is very limited ability to accelerate delivery timeframes.	High certainty

Source: *Sydney Water Growth Servicing Plan 2022 – 2027*

6.4.3 Choice of investment horizon

IPART's 2018 Determination requires[26] us to maintain enough DSPs, covering a large enough geographic area, to ensure we capture all current demand and expected medium-term growth in the demand for our services.

The phrase 'medium-term' is not defined, leaving some flexibility to decide how much future investment will be included in our infrastructure contribution prices. For example, if future development plans beyond 20 years are uncertain, we might choose a shorter time horizon to calculate infrastructure contribution prices for the relevant DSP area.

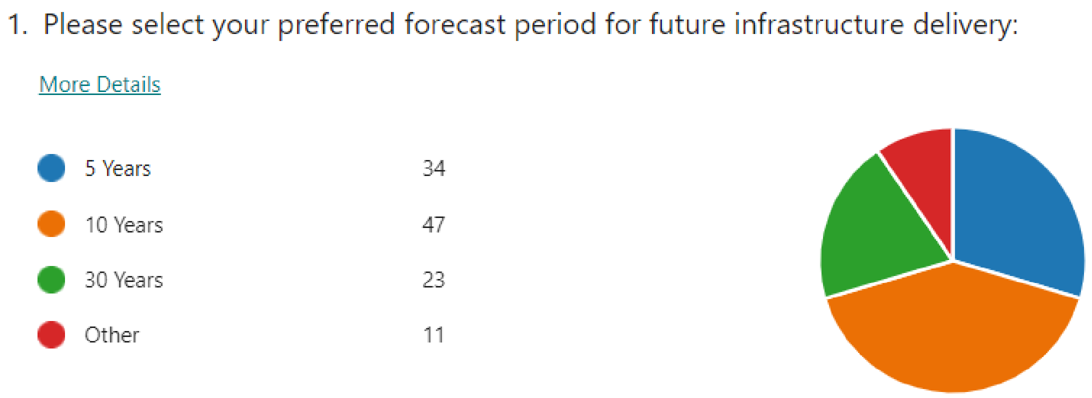
Whatever time horizon is chosen, the IPART methodology will calculate the correct price needed to achieve full recovery of eligible costs by the end of that horizon. Investment that occurs after the chosen investment horizon will be captured in a future iteration of our DSPs (which may or may not use the same DSP boundaries).

We sought feedback on the choice of investment horizon as part of our early engagement on the reintroduction of infrastructure contributions (see also section 4.2.1). Between 15 August and 9 September 2022, we published an online survey about the choice of investment horizon, with an opportunity for free text responses for respondents to explain their choice. We also held in-person briefings for some of the peak developer groups such as the UDIA and the Urban Taskforce.

Of the 115 responses survey received, the overwhelming majority preferred a 5 or 10-year investment horizon (71% in total), with only 20% selecting a 30-year horizon (see **Figure 6-2**).

Many respondents felt that 10 years was a good match to the typical timeframe for development precincts, and plans beyond 20 years were too uncertain.

Figure 6-2 Results of our online survey on DSP investment horizon



In our previous implementation of DSPs, in 2006, we generally adopted a five-year investment horizon. Consistent with the results of stakeholder engagement, and also the inherent extra uncertainty regarding the timing and value of future asset delivery, we have generally opted for a 10-year investment horizon for the current round of DSPs.

[26] See Schedule 4, Clause 1.

Once we have selected the investment horizon for pricing purposes, we must also check to ensure our forecast of future development (ETs) aligns with the service potential of those new assets (including any available capacity in existing assets).

For example, in some locations an investment within the next 10 years can continue to enable new connections for 20 years or more. In these systems, we would therefore recognise 20 years of future ETs when calculating the infrastructure contribution price. In other systems, however, the incremental service potential may be much smaller and our forecast of new ETs must be trimmed accordingly.

7 Net operating result

Each new connection to a network results in:

- Additional revenue from regulated retail prices; and
- Additional operating costs as end-use customers make use of our services.

Regulated retail prices are designed to allow Sydney Water to recover the efficient cost of providing services using IPART's Building Block Method (BBM) and are set in such a way that each type (or class) of customer pays the same price no matter where they are located (an approach known as postage stamp pricing).

In other words, regulated retail prices are a measure of the average cost of providing a customer with a service, considering the cost of building, operating and maintaining existing and future assets.

IPART's infrastructure contribution pricing methodology takes incremental revenue into account as part of setting a price for a specific DSP area.

If servicing costs in a DSP area are very low, the normal ongoing revenue from each new customer can be enough to cover the cost of providing them with services. It is possible that no infrastructure contribution will be payable in these low-cost areas.

In areas with higher costs, the developer must contribute because revenue from new customers is not sufficient to fully recover costs. If we did not collect a contribution from the new connections enabled by developers, bills for all other customers would have to increase.

Without a framework for infrastructure contributions, the additional costs of new growth are recovered through water and wastewater service contributions from existing customers, placing additional pressure on general water and wastewater prices.

7.1 Revenue from new connections

Revenue from new connections is a function of the number and type of new connections, and the level of structure of our regulated prices.

7.1.1 Regulated prices

IPART has set regulated prices for the period 1 July 2020 to 30 June 2024, as set out in their 2020 Determination. IPART intends to make a new price determination for Sydney Water in mid-2025, with new prices to apply from 1 July 2025.

As IPART will not have issued a new determination by 1 July 2024, the prices in the last year of the 2020 determination period continue to apply but without any adjustment for inflation. This means that prices from 2024-25 onwards will be lower in real terms, due to the deferral of the retail price determination. Table 7-1 sets out the assumed regulated retail prices we have used to help calculate infrastructure contribution prices. We have removed any temporary adjustments (cost pass-throughs) to water service charges relating to the use of SDP.

Table 7-1: Regulated prices for infrastructure contribution modelling, $2022-23

Price	2022-23	2023-24	2024-25#	2025-26+
Water usage price ($ / kL)	$2.50	$2.50	$2.43	$2.43
Water service charge ($ / year)				
20 mm meter	$42.41	$42.41	$41.27	$41.27
25 mm meter	$66.27	$66.27	$64.48	$64.48
32 mm meter	$108.57	$108.57	$105.65	$105.65
40 mm meter	$169.64	$169.64	$165.08	$165.08
50 mm meter	$265.06	$265.06	$257.94	$257.94
80 mm meter	$678.56	$678.56	$660.32	$660.32
100 mm meter	$1,060.25	$1,060.25	$1,031.75	$1,031.75
Wastewater usage price ($ / kL)	$1.28	$1.28	$1.25	$1.25
Residential wastewater service charge ($ / year)	$579.49	$579.49	$563.98	$563.98
Wastewater service charge ($ / year)				
20 mm meter	$516.65	$516.65	$502.82	$502.82
25 mm meter	$807.27	$807.27	$785.66	$785.66
32 mm meter	$1,322.62	$1,322.62	$1,287.22	$1,287.22
40 mm meter	$2,066.61	$2,066.61	$2,011.30	$2,011.30
50 mm meter	$3,229.08	$3,229.08	$3,142.66	$3,142.66
80 mm meter	$8,266.43	$8,266.43	$8,045.19	$8,045.19
100 mm meter	$12,916.29	$12,916.29	$12,570.06	$12,570.06

assumes inflation of 2.8% in 2024-25

7.1.2 New connections

Our approach to forecasting new connections is discussed in section 5.2 of this report.

When calculating revenue from new non-residential connections, we use forecasts of the number of new properties by different meter sizes (ie, not ETs).

7.2 Operating costs

The forecast of future operating expenditure reflects the draft 2023-24 Statement of Corporate Intent (SCI). The SCI is an annual agreement between Sydney Water and the Government (via its Shareholder Ministers), with a proposed budget and commitments to deliver against customer service, environmental, public health, commercial and staff performance objectives and targets.

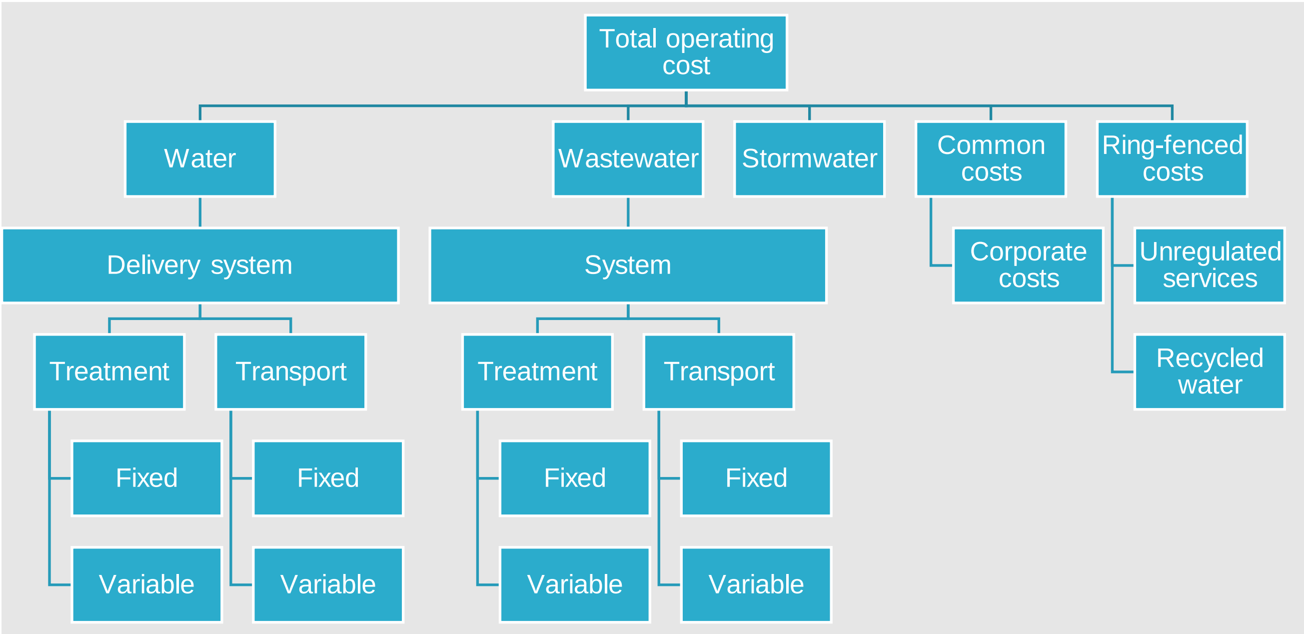
The SCI operating expenditure forecast reflects anticipated growth in the number of connected properties as well as forecast volumes (beginning with drinking water demand, and then wastewater volumes based on assumed discharge factors) (see also section 5.2).

7.2.1 Cost allocation approach

When setting regulated retail prices, IPART already requires us to record and allocate costs to our core products: water, wastewater and stormwater services. The allocation process includes common costs, such as our customer billing system, which are used across multiple products.

Other costs, such as for recycled water schemes, are generally kept separate (ring-fenced) unless IPART has decided that part of those costs can be recovered via the other products.

To calculate infrastructure contribution prices by DSP area, we must further allocate our product-based costs to specific geographic areas.



Actual expenditure from 2018-19 was used to identify expenditure by individual systems, consistent with the method described in Sydney Water's Cost Allocation Manual. The system-based costs were then converted to appropriate units (per connection, or per kilolitre) to allow derivation of opex forecasts on a system-by-system basis.

Where historical information was not available (eg, for proposed new systems like Upper South Creek), operating cost forecasts were sourced from relevant planning reports and/r business cases. In general, operating costs for these new systems has been estimated as a percentage of the proposed capital expenditure (eg, 1% of capex).

8 Appendices

8.1 Water systems and their proposed DSP areas

Our proposed DSP model for drinking water combines most water delivery systems into a single, Greater Sydney Drinking Water DSP. The systems that make up the combined Greater Sydney Drinking Water DSP are shown in the following table.

The table below also shows the individual infrastructure contribution price that could have applied in each water delivery system had we decided on a more detailed DSP model. For the avoidance of doubt, we are not proposing to levy the prices in the third column of the table below. The system-based charges are presented for information, to allow a comparison of our proposed DSP model against a potential alternative.

Table 8-1 Drinking water delivery systems by DSP area and system-based prices

Development Servicing Plan and their water delivery systems	Proposed price ($ / ET) we would charge	Price if each system was a separate DSP area ($ / ET) (not proposed)
Greater Sydney Drinking Water DSP	$3,282	
Cascade		$5,019
Illawarra (growth precincts)		$3,378
Macarthur		$4,693
Nepean		$10,012
North Richmond		$4,537
Orchard Hills		$3,049
Prospect North		$2,355
Prospect South		$3,570
Ryde#		$0
Warragamba		$9,323
Woronora		$3,624
Potts Hill Drinking Water DSP	$0	
Potts Hill		$0
Prospect East Drinking Water DSP	$0	
Prospect East		$0
Illawarra Drinking Water	$0	
Illawarra (infill areas)		$0

Ryde delivery system was only marginally below $0, and marginally above $0 when using 30-year investment forecasts. Minor changes in assumptions result in a non-zero charge in most scenarios, and it has therefore been included in the wider DSP for Greater Sydney.

8.2 Wastewater systems and DSP areas

The systems that make up each of our wastewater DSP areas are shown in **Table 8-2**.

The table also shows the individual infrastructure contribution price that could have applied in each wastewater system had we decided on a more detailed DSP model.

In some cases, the individual or system-based DSP price may not reflect our intended servicing strategies and therefore may be a true reflection of the standalone system price.

For the avoidance of doubt, we are not proposing to levy the prices in the third column of the table below. The system-based charges are presented for information, to allow a comparison of our DSP model against a potential alternative.

Table 8-2 Wastewater systems by DSP area and system-based prices

Development Servicing Plan and their wastewater systems	Proposed price ($ / ET) we would charge	Price if each system was a separate DSP area ($ / ET) (not proposed)
Picton Wastewater DSP	$40,728	$40,728
West Camden Wastewater DSP	$4,795	$4,795
Wilton Wastewater DSP	$22,167	$22,167
Nepean River Wastewater DSP	$16,020	
Penrith		$13,879
Wallacia		$18,479
Winmalee		$9,910
Upper South Creek		$18,484
Richmond Wastewater	$21,387	$21,387
Lower South Creek Wastewater DSP	$6,183	
Quakers Hill		$2,011
Rivestone		$11,129
St Marys		$5,045
Norwest Wastewater DSP	$3,961	
Castle Hill		$3,358
Rouse Hill		$3,600
Berowra Creek Wastewater DSP	$6,482	
Hornsby Heights		$1,389
West Hornsby		$10,776
Bondi Wastewater DSP	$0	$0
Malabar Wastewater DSP	$805	$805
North Head Wastewater DSP	$588	$588
Outer Sydney Coastal Wastewater DSP	$2,382	
Cronulla		$508
Warriewood		$10,206
Southern Illawarra Wastewater DSP	$13,434	
Bombo		$5,588
Gerringong Gerroa		$11,857
Shellharbour		$10,655
Wollongong Growth Precincts		$20,566
Northern Illawarra Wastewater DSP	$0	
Wollongong (infill areas)		$0

8.3 Criteria for assessing potential DSP boundaries

The following criteria were used as a guide to understand the impacts of merging different systems (or parts of systems) together in the same DSP boundary. A proposed DSP combination may perform well on some criteria but not others, or impacts may all be clustered at one end of the spectrum (low impact, or high impact). In general, if impacts are towards the 'high impact' end of the scale then merging those systems is potentially not a desirable outcome.

Criteria	Small	Medium	Large
Scale of development (ET's / year)	<600 (0-1 eDev# case / month)	600 – 1,200 (2 eDev cases / month)	>1,200 (>2 eDev cases / month)
Scale of investment ($m next 10 years)	<$100m	$100 – 300m	>$300m
Weighted average change in price (effect on price signal) ($ / ET)	<$3,500	$3,500 – $10,000	>$10,000
Change in cost recovery ($m / year) (transfer to customer bills)	<$2m	$2 – 10m	>$10m
Interpretation of ratings	Low impact Negligible impact of merging	Medium impact Assess impacts of merging	High impact Avoid merging with other areas

#eDev refers to Sydney Water's eDeveloper workflow software, which is used to manage individual applications for Section 73 Compliance Certificates. The number of cases is therefore a proxy for administrative burden from a larger or smaller number of DSPs.

8.4 MEERA Unit Rates

This section presents various MEERA unit rates used to establish a value for commissioned assets. All figures are subject to indexation adjustments to ensure final infrastructure contribution prices are expressed in today's dollars.

Table 8-3 Unit rates ($ / meter) for wastewater gravity mains commissioned prior to 1 January 1996, by pipe size and depth, 2005-06$

Depth: Diameter	1-2m	2-3m	3-4m	4-5m	5-6m	6-7m	7-8m	8-9m	9-10m	11m+
150	167	194	270	311	353	404	404	404	404	404
200	220	248	310	347	385	429	429	429	429	429
225	220	248	310	347	385	429	429	429	429	429
280	276	303	348	383	420	461	461	461	461	461
300	276	303	348	383	420	461	461	461	461	461
355	260	287	319	356	392	435	435	435	435	435
375	260	287	319	356	392	435	435	435	435	435
450		511	511	544	583	628	672	672	672	672
500		580	580	618	659	705	751	751	751	751
525		580	580	618	659	705	751	751	751	751
600		722	722	757	801	850	893	893	893	893
675		937	937	968	1022	1082	1141	1141	1141	1141
750		937	937	968	1022	1082	1141	1141	1141	1141
900		1257	1257	1300	1355	1408	1458	1515	1570	1633

Depth: Diameter	1-2m	2-3m	3-4m	4-5m	5-6m	6-7m	7-8m	8-9m	9-10m	11m+
1000		1445	1445	1504	1561	1621	1678	1737	1794	1859
1050		1445	1445	1504	1561	1621	1678	1737	1794	1859
1200		1662	1662	1711	1772	1839	1901	1960	2019	2094
1350				2016	2082	2161	2230	2299	2359	2424
1500				2360	2417	2497	2572	2645	2706	2772
1650					3041	3136	3219	3304	3389	3466
1800					3041	3136	3219	3304	3389	3466
2100						3941	4047	4144	4244	4339

Source: Sydney Water Development Servicing Plans published in 2006

Table 8-4 Unit rates ($ / meter) for wastewater pressure mains commissioned prior to 1 January 1996, by pipe size and depth, 2005-06$

Depth: Diameter	1-2m	2-3m	3-4m	4-5m	5-6m	6-7m
100	113	133	133	133	133	133
150	175	194	194	194	194	194
200	214	233	233	233	233	233
225	214	233	233	233	233	233
280	245	264	264	264	264	264
300	245	264	264	264	264	264
355	295	313	313	313	313	313
375	295	313	313	313	313	313
450		335	335	335	335	335
500		443	443	443	443	443
525			443	443	443	443
600			533	533	533	533
675			650	650	650	650
750			650	650	650	650
900			928	928	928	928

Table 8-5 Unit rates ($ / meter) for wastewater gravity mains commissioned between 1 January 1996 and 30 June 2006, by pipe size and depth, 2005-06$

Depth: Diameter	1-2m	2-3m	3-4m	4-5m	5-6m	6-7m	7-8m	8-9m	9-10m	11m+
100	298	345	473	530	589	658	658	658	658	658
150	309	350	479	537	596	665	665	665	665	665
200	351	394	514	575	637	707	707	707	707	707
225	351	394	514	575	637	707	707	707	707	707
280	416	458	555	603	662	716	716	716	716	716
300	416	458	555	603	662	716	716	716	716	716
355	502	547	672	742	813	881	881	881	881	881
375	502	547	672	742	813	881	881	881	881	881
450			914	1006	1097	1192	1286	1286	1286	1286
500			1022	1120	1220	1321	1422	1422	1422	1422
525			1022	1120	1220	1321	1422	1422	1422	1422
600			1190	1302	1416	1525	1640	1640	1640	1640
675			1469	1599	1730	1856	1987	1987	1987	1987
750			1469	1599	1730	1856	1987	1987	1987	1987
900			1965	2130	2286	2458	2631	2780	2930	3126
1000			2397	2568	2746	2918	3116	3286	3463	3639

Depth: Diameter	1-2m	2-3m	3-4m	4-5m	5-6m	6-7m	7-8m	8-9m	9-10m	11m+
1050			2397	2568	2746	2918	3116	3286	3463	3639
1200			2828	3078	3314	3573	3820	4034	4256	4489
1350				3486	3704	3923	4167	4374	4591	4806
1500				3937	4195	4430	4677	4924	5143	5376
1650					5237	5537	5814	6122	6380	6636
1800					5237	5537	5814	6122	6380	6636
2100						6990	7352	7754	8097	8436

Source: Sydney Water Development Servicing Plans published in 2006

Table 8-6 Unit rates ($ / meter) for drinking water gravity mains commissioned between 1 January 1996 and 30 June 2006, by pipe size, location and installation method, 2005-06$

Modern pipe Material and dia	Open trench CBD	Open trench non-CBD	Above ground CBD	Above ground non-CBD	Pipe-bursting CBD	Pipe-bursting non-CBD	Original pipe types
Copper							
20mm	$150.57	$147.94					SCL, SS
25mm	$174.77	$171.40					SCL, SS
32mm	$198.21	$188.89					SCL, SS
40mm	$228.93	$212.67					SCL, SS
50mm	$253.91	$236.90					SCL, SS
80mm	$288.83	$265.38					SCL, SS
DICL							
375mm	$1,748.86	$1,100.72	$1,373.20	$1,373.20	$1,841.02	$1,290.96	SCL
400mm	$1,748.86	$1,100.72	$1,373.20	$1,373.20	$1,841.02	$1,290.96	VC, PE
450mm	$1,748.86	$1,100.72	$1,373.20	$1,373.20	$1,841.02	$1,290.96	CICL, GRP, HDPE, mPVC, oPVC, RC, uPVC, PE
500mm	$2,107.69	$1,325.83	$1,530.91	$1,530.91	$2,288.51	$1,409.22	CICL, RC, PE
560mm	$2,107.69	$1,325.83	$1,530.91	$1,530.91	$2,288.51	$1,409.22	PE
600mm	$2,398.97	$1,909.38	$1,949.63	$1,949.63	$2,493.78	$1,903.20	CICL, GRP, RC, WI
750mm	$3,079.54	$2,496.85	$2,545.17	$2,545.17	$3,183.82	$2,500.15	CICL, GRP, RC, PE
mPVC							

Modern pipe Material and dia	Open trench CBD	Open trench non-CBD	Above ground CBD	Above ground non-CBD	Pipe-bursting CBD	Pipe-bursting non-CBD	Original pipe types
355mm	$1,506.80	$872.71	$1,294.35	$1,294.35	$1,707.79	$1,185.49	PE, AC
375mm	$1,506.80	$872.71	$1,294.35	$1,294.35	$1,707.79	$1,185.49	CICL, GRP, mPVC, oPVC, RC, PE
MSCL							
100mm	$900.59	$698.59	$426.94	$426.94	$900.59	$698.59	SCL, SS
150mm	$967.00	$744.00	$584.65	$584.65	$967.00	$744.00	SCL, SS
200mm	$1,112.22	$854.03	$742.36	$742.36	$1,112.22	$854.03	SCL, SS
250mm	$1,237.45	$934.62	$900.07	$900.07	$1,237.45	$934.62	SCL, SS
300mm	$1,425.96	$1,051.75	$1,057.78	$1,057.78	$1,425.96	$1,051.75	RC, SCL, SS
350-400mm	$1,707.79	$1,185.49	$1,373.20	$1,373.20	1707.79	1185.49	SCL, SS
450mm	$1,841.02	$1,290.96	$1,530.91	$1,530.91	$1,841.02	$1,290.96	SCL, SS
500mm	$2,288.51	$1,409.22	1530.91	1530.91	$2,288.51	$1,409.22	CL IBL, SS, SCL
600-660mm	$2,493.78	$1,903.20	$1,949.63	$1,949.63	$2,493.78	$1,903.20	HDPE, SCL, SS
750-800mm	$3,183.82	$2,500.15	$2,545.17	$2,545.17	$3,183.82	$2,500.15	FL BAR, SCL, SS, CICL
900mm	$3,641.45	$2,889.36	$2,762.03	$2,762.03	$3,641.45	$2,889.36	CICL, DICL, FL BAR, RC, SCL, SS
1050mm	$4,077.92	$3,362.70	$3,120.76	$3,120.76	$4,077.92	$3,362.70	CICL, HDPE,

Modern pipe Material and dia	Open trench CBD	Open trench non-CBD	Above ground CBD	Above ground non-CBD	Pipe-bursting CBD	Pipe-bursting non-CBD	Original pipe types
							SCL, SS, WI
1250mm	$4,533.04	$3,732.36	$3,185.32	$3,185.32	$4,533.04	$3,732.36	SCL
1350mm	$5,331.96	$3,876.02	$3,856.41	$3,856.41	$5,331.96	$3,876.02	SCL
1500mm	$6,111.24	$4,604.64	$4,539.21	$4,539.21	$6,111.24	$4,604.64	SCL, SCL IBL
1650mm	$6,854.84	$5,271.98	$5,404.82	$5,404.82	$6,854.84	$5,271.98	SCL
1800mm	$8,099.89	$5,934.15	$5,696.55	$5,696.55	$8,099.89	$5,934.15	SCL, WI
2100mm	$9,065.56	$6,820.99	$6,427.35	$6,427.35	$9,065.56	$6,820.99	SCL
2450mm	$11,053.68	$7,747.77			$11,053.68	$7,747.77	SCL
3000mm	$15,029.08	$11,330.78	$9,437.96	$9,437.96	$15,029.08	$11,330.78	RC, SCL
oPVC							
100-125mm	$652.84	$438.65	426.94	426.94	$900.59	$698.59	Various
150mm	$719.05	$479.13	$584.65	$584.65	$967.00	$744.00	Various
180mm	$868.20	$579.56	$742.36	$742.36	$1,112.22	$854.03	Various
200mm	$868.20	$579.56	$742.36	$742.36	$1,112.22	$854.03	Various
250mm	$975.99	$649.15	$900.07	$900.07	$1,237.45	$934.62	Various
300mm	$1,115.28	$719.03	$1,057.78	$1,057.78	$1,425.96	$1,051.75	Various

Table 8-7 Unit rates ($ / meter) for drinking water pressure mains commissioned prior to 1 January 1996, by pipe size and material, 2005-06$

Diameter	Ductile Iron	Steel
100	166	248
150	193	288
200	248	350
250	295	383
300	324	501
375	384	542
400	484	599
500	549	633
600	788	836
750	1077	1004
900		1472
1050		1785
1200		2181
1400		2062
1600		2863
1800		3201
2100		4032

Table 8-8 Unit rates ($ / meter) for drinking water pressure mains commissioned between 1 January 1996 and 30 June 2006, by pipe size and material, 2005-06$

Diameter	Ductile Iron	Steel
100	230	357
150	285	398
200	327	453
250	382	507
300	443	595
375	566	803
400	785	948
500	915	1081
600	1334	1452
750	1711	1799
900		2394
1050		2783
1200		3555
1400		3578
1600		4716
1800		5158
2100		6273

8.5 EPL licence limits for wet weather overflows

Table 8-9 EPL limits for wet weather sewage overflows

System / sub-system	Number of events per 10 years	
	Network overflows	Exceedance of treatment plant disinfection capacity
Bondi	154	5
Cronulla	73	0
Malabar	238	-
Malabar WWTP	-	58
Liverpool WWTP	-	0
Glenfield WWTP	-	0
North Head	228	1
Bombo	40	17
Castle Hill	20	116
Hornsby Heights	27	48
North Richmond	10	20
Penrith	36	198
Glenbrook	10	-
Quakers Hill	48	134
Richmond	19	32
Riverstone	14	11
Rouse Hill	12	69
Shellharbour	45	52
St Marys	35	153
Wallacia	25	74
Warriewood	31	92
West Camden	18	65
West Hornsby	27	46
Winmalee	10	32
Wollongong	40	-
Wollongong WWTP	-	11
Bellambi SSTP	-	114
Port Kembla SSTP	-	99

8.6 Design demands for drinking water asset planning

Table 8-10 Design water demands by property type (BASIX compliant)

Property type	Demand criteria	Units	Design volume
Single residential dwelling	Average day	kL / dwelling / day	0.75#
	Maximum day	kL / dwelling / day	2.2
	Maximum hour	kL / dwelling / day	5.5
Town house (< 30 units / net ha)	Average day	kL / unit / day	0.7
	Maximum day	kL / unit / day	1.6
	Maximum hour	kL / unit / day	3.52
Multi-units (30-60 units / net ha)	Average day	kL / unit / day	0.63
	Maximum day	kL / unit / day	1.35
	Maximum hour	kL / unit / day	2.7
Multi-units (61-100 units / net ha)	Average day	kL / unit / day	0.53
	Maximum day	kL / unit / day	1.09
	Maximum hour	kL / unit / day	2.18
Multi-units (101-140 units / net ha)	Average day	kL / unit / day	0.44
	Maximum day	kL / unit / day	0.88
	Maximum hour	kL / unit / day	1.76
Multi-units (>140 units / net ha)	Average day	kL / unit / day	0.42
	Maximum day	kL / unit / day	0.8
	Maximum hour	kL / unit / day	1.6
Light industrial	Maximum day	kL / Net Ha / day	40
	Maximum hour	kL / Net Ha / day	64
Medium industrial	Maximum day	kL / Net Ha / day	66
	Maximum hour	kL / Net Ha / day	1.6 x max day
Heavy industrial	Demands	kL / Net Ha / day	Site assessment
Suburban commercial	Maximum day	kL / Net Ha / day	41
	Maximum hour	kL / Net Ha / day	2 x max day
Large retail	Maximum day	kL / Net Ha / day	63
	Maximum hour	kL / Net Ha / day	2 x max day
High rise commercial	Maximum day	kL / Floor Ha / day	63
	Maximum hour	kL / Floor Ha / day	2 x max day

includes 0.55 kilolitres per day of drinking water plus 0.2 kilolitres per day of water sourced from non-potable sources (eg, rainwater tanks)

8.7 Version control

This document will be updated from time-to-time if we change the way we implement IPART's pricing methodologies, including if / when IPART review and update their methodology.

Version number	Date published	Section(s) updated
1.0	28 April 2023	New document for public exhibition
1.1	June 2023	Updated document to reflect feedback received during the public exhibition period.
1.2	6 September 2023	Updated document to reflect the final set of Development Servicing Plans submitted to IPART for registration.
1.3	22 November 2023	Updated document to reflect changes to the methodology for allocating land to DSP areas, which results in changes to the Greater Macarthur DSP area, and updated prices for two DSP areas to correct previously unidentified calculation errors.

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