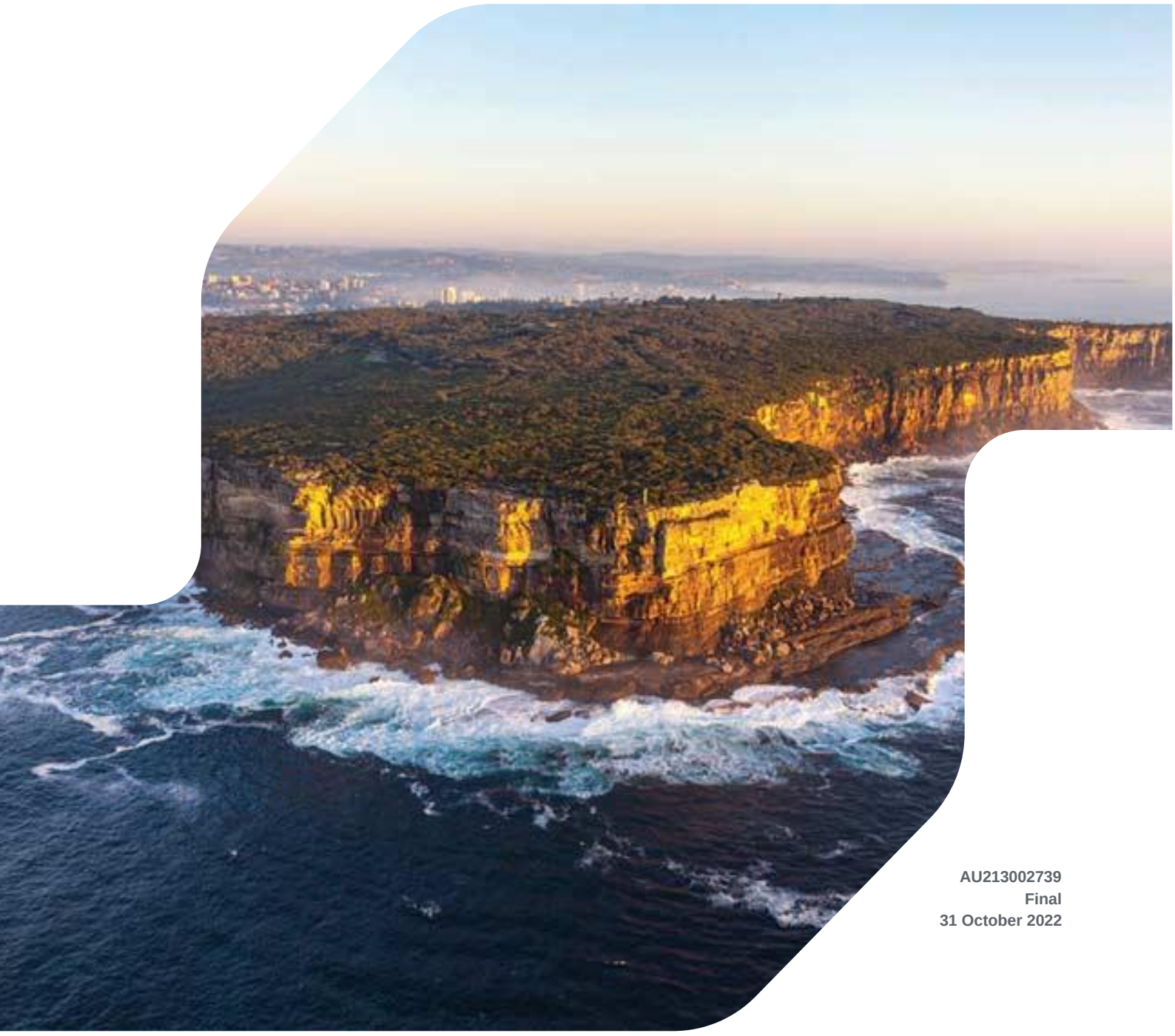
TOWARDS IMPROVED GOVERNANCE AND FUNDING FOR GREATER SYDNEY HARBOUR WATERWAY HEALTH



AU213002739
Final
31 October 2022

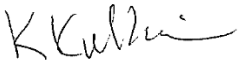
Image attribution: Harbour Trust

rpsgroup.com

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
Draft 1	First draft	Jamie Bennetts, Kapil Kulkarni	Kapil Kulkarni		11/08/2022
Draft 2	Second draft	Jamie Bennetts, Kapil Kulkarni	Ana Terrazas, Erin Sellers, Lyndall Pickering		25/08/2022
Draft 3	Third draft	Jamie Bennetts, Kapil Kulkarni	Ana Terrazas, Erin Sellers, Lyndall Pickering, Martina Doblin		21/10/2022
Final Draft	Final draft	Jamie Bennetts, Kapil Kulkarni	Sarah Joyce		
Final	Final document	Jamie Bennetts, Kapil Kulkarni	Kapil Kulkarni	Kapil Kulkarni	31/10/2022

Approval for issue

Kapil Kulkarni		31 October 2022

Prepared by:

RPS

Kapil Kulkarni
Director

Level 13, 420 George Street
Sydney NSW 2000

T +61 2 8099 3200
E kapil.kulkarni@rpsgroup.com.au

Prepared for:

Sydney Coastal Councils Group

Sarah Joyce
Executive Officer

30 Frances Street, Randwick
NSW 203

T 0407733075
E executiveofficer@sydneycoastalcouncils.com.au

EXECUTIVE SUMMARY

Greater Sydney Harbour and the impact of stormwater discharge

The waterways of the Greater Sydney Harbour (GSH) catchment have a significant environmental, recreational, scenic and economic value to Australians. The GSH area covers Sydney Harbour, as well as the freshwater and estuarine environments of the rivers and tributaries that ultimately drain into the harbour.

Figure 1 shows the boundary of the area defined as the GSH.

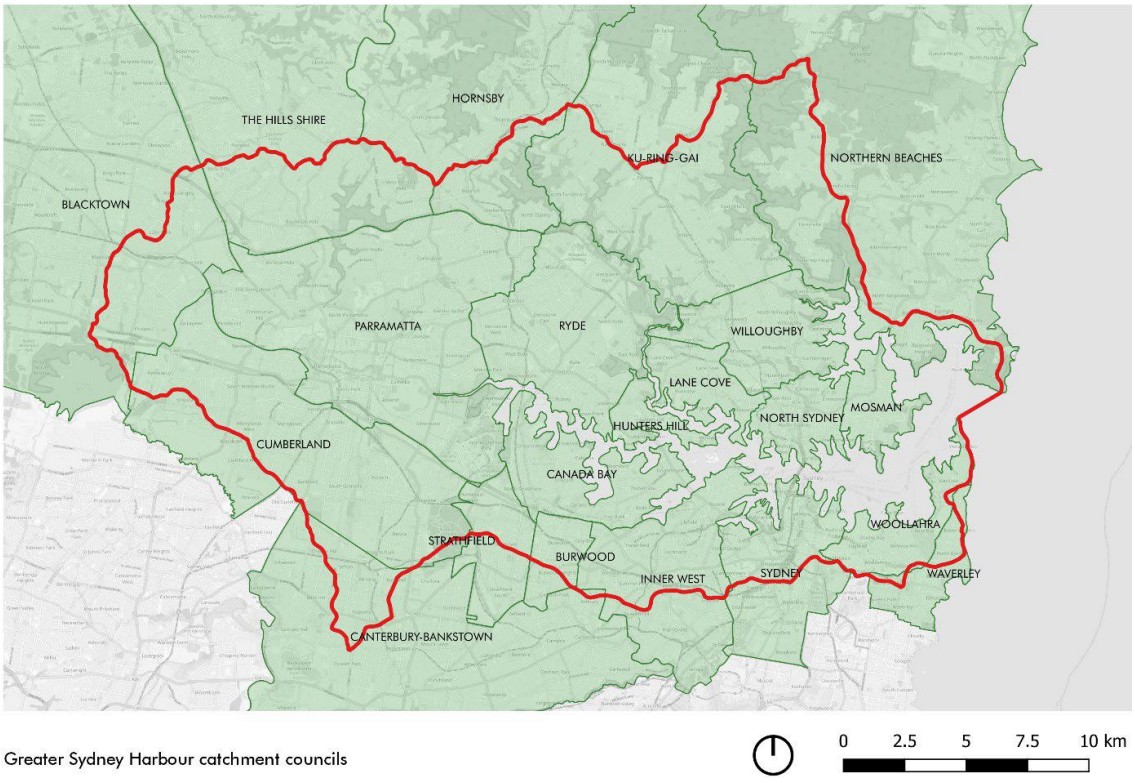


Figure 1 Greater Sydney Harbour catchment

Despite being recognised as such an iconic and valuable asset in NSW's marine estate, thousands of tons of pollutants continue to enter the harbour through the stormwater discharge system and sewage overflows. Stormwater is the major threat to the ecological integrity of Sydney Harbour and its tributaries, threatening the wide social, environmental and economic benefits the waterway provides.

Coastal Management Program to address stormwater

As shown in Figure 1, the GSH catchment spans 21 council areas. As such, the health of the GSH waterways is a responsibility shared by these councils, Sydney Water and state and federal Government, among others.

Recognising this shared responsibility, the Sydney Coastal Councils Group (SCCG) and the Parramatta River Catchment Group (PRCG) are preparing a Coastal Management Program (CMP) for the GSH, which seeks to improve waterway health through improved coordination, consistency and leadership..

CMPs, which are prepared under the *NSW Coastal Management Act 2018*, help local councils manage their coastal assets over the long-term by identifying key threats and outlining the actions required to address these threats. CMPs follow an integrated approach to coastal zone management, balancing and incorporating viewpoints from diverse fields, including coastal science, public finance and governance theory, in order to achieve optimal public policy outcomes.

The CMP follows a staged process as shown in Figure 2. Stage 1 identified stormwater as one of the key threats to the health of the harbour.

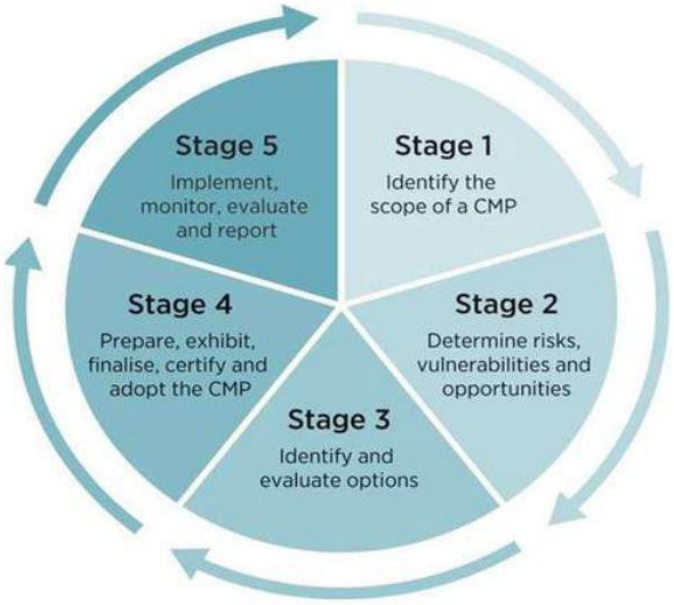


Figure 2 CMP Stages

Purpose of this study

Stage 2 of a CMP involves determining risks, vulnerabilities and opportunities. For the GSH CMP, Stage 2 has included three studies of which this is the third. These studies are:

- Study 1, which has been completed by Civille (2022), to obtain information on different ways the 20 participating councils and state agencies are managing and funding stormwater activities within the GSH region, and the impediments to effective coordination.[1]
- Study 2 has investigated and recommended actions to improve the management of Greater Sydney Harbour.
- Study 3 (this study) has developed and proposed a funding and governance framework for stormwater management in the GSH (the Study).

The SCCG commissioned RPS to complete Study 3.

The approach to recommending an optimal governance and funding framework for the CMP, included three main phases:

- **Phase 1:** Framing and background review, including framing the problem and review of prior studies about the problem.
- **Phase 2:** Research of relevant governance and funding mechanisms, including desktop research and discussions with stakeholders.
- **Phase 3:** Testing and refinement of options with stakeholders, through two workshops where alternative options for improved governance and funding were presented and feedback was sought from participants.

[1] Since the time of that study, an additional Council (Strathfield) has joined the PRCG but their participation on the CMP process is yet to be confirmed.

Limitations in existing governance and funding approaches

This Study identified three inter-related problems that lead to the lack of clear and effective governance, and the inadequate funding for GSH waterway health. These are as follows:

1. The entities that are able to deliver solutions lack the direct incentives/responsibility to deliver them.
2. Existing funding frameworks have targeted focuses or limitations.
3. The entities that are able to deliver solutions lack the organisational capacity to deliver them.

These problems provided the rationale for a revised governance and funding framework and the development of the following problem statement:

> "The responsibilities for managing stormwater quality and its impacts on the GSH are spread across various levels of government, developers and utilities, and are funded through a range of sources. Each organisation addresses discrete issues and while there is some inter-organisation collaboration, this is limited to selected projects. The current model does not provide for a long-term and sustainable funding mechanism with clear responsibility for catchment wide issues that affect the health of GSH waterways."

This characterisation of the problem aligns with prior fundings such as those of the Productivity Commission (2020), who outlined the problems in the context of Integrated Urban Water Management being:

- There are barriers to effective collaboration
- Roles and responsibilities for providing enhanced amenity are unclear
- There is a lack of clear objectives for water-related aspects of enhanced urban amenity.

Review of case studies

The options for improved governance and funding were developed through a case study review of example governance and funding frameworks, which focused on those that were in place to manage water quality impacts in urban estuarine environments, and included:

- Melbourne
- Southeast Queensland (SEQ)
- The River Thames, London, United Kingdom
- Chesapeake Bay, which near Washington DC, United States
- San Francisco Bay, United States
- The Hudson River Keeper, New York, United States
- The Derwent Estuary Program, in Tasmania
- The Georges River Keeper
- Council partnerships / council groups (SCCG, PRCG, Rous County Council, Northern Rivers Joint Organisation of Councils (JOC))
- Management of river basins in Denmark.

To provide some structure to the study, and to assist with the development and assessment of potential options for the GSH, the study team found it useful to summarise the types of case studies along two main dimensions:

- **Top-down vs bottom-up:** Whether the delivery of actions is coordinated primarily by directives from government or regulatory institutions, or whether it involves a more interactive bottom-up approach
- **Organic vs statutory backing:** Whether the governance and funding structures have developed without the need for legislative and/or regulatory backing, or is largely due to such backing.

Figure 6 presents the various case studies review along these dimensions.

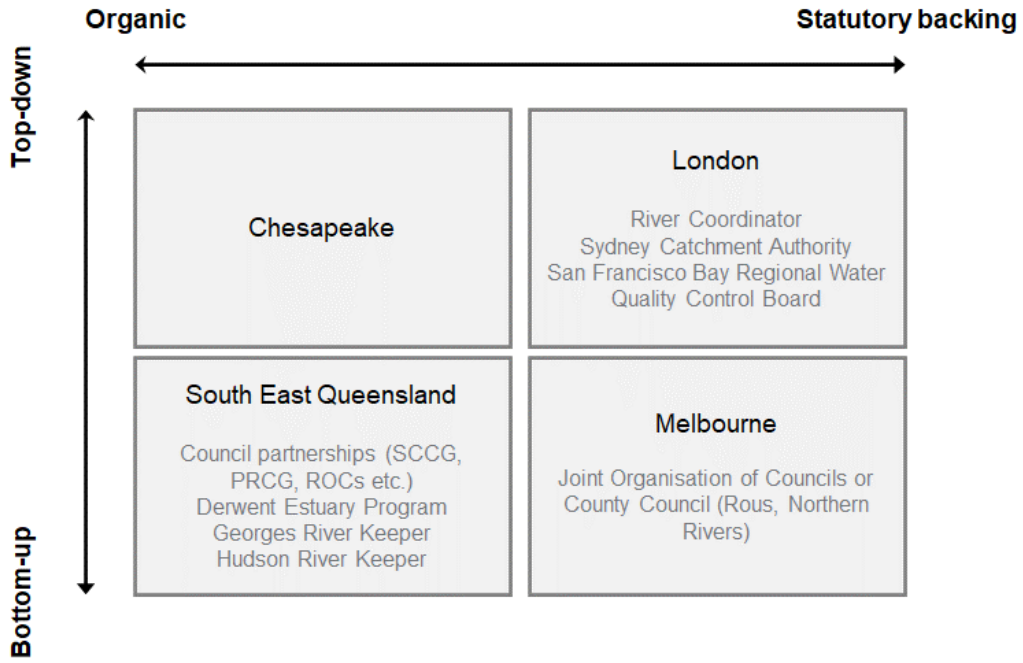


Figure 3 Summary of case studies

Options for improved governance and funding

Some of the observed key success factors of these case studies were that:

- Where the waterways were of recognised national importance, there were key roles played by national bodies. This includes the role of the:
  - United States Government and the US EPA in the case of Chesapeake
  - House of Commons in the UK.
- The mostly voluntary nature of the collaboration in the case of SEQ has likely been easier because fewer groups were involved, noting that Council areas in SEQ are much larger compared to GSH.
- In terms of council groups, the county council structures can own and operate infrastructure assets but JOCs or ROCs do not.
- Major capital investment has required funding contributions from the federal and/or state governments, such as the investments require to transform the Thames and invest in Waster Sensitivity Urban Design (WSUD) and capacity building in the Yarra River catchments.

By considering these success factors and the context of the GSH, Study 3 developed the following high level ('straw-person') options, which were presented to stakeholders and iteratively refined to arrive at a preferred option.

- **Option 1 – Legislated financial instrument:** Implementing a levy for catchment management similar to Environmental Contributions, which is used to fund Catchment Management Authorities (CMAs) in Victoria, which would fund a CMA and would be recoverable through water bills.
- **Option 2 – Whole-of-government approach:** Signing of a partnership between the three levels of government to fund and invest in actions for GSH waterway health.
- **Option 3 – Formation of a catchment authority:** Creating a statutory authority to monitor and manage the health of GSH waterways.
- **Option 4 – Joint Organisation of Councils:** Establishing a Joint Organisation (JO) of Councils under the Local Government Act 1993 to monitor and manage the health of GSH waterways.

Recommended option

Through iterative feedback from stakeholders and RPS' independent assessment, Study 3 recommended the following governance and funding approach, which was ultimately a hybrid of various options considered earlier on in the study:

- The establishment of a partnership of the three levels of Government, First Australians and Sydney Water, and the signing of a partnership agreement
- The agreement would include a commitment to establish a coordinating entity that will coordinate and implement projects in GSH waterway health
- That entity would not be the investor nor asset owner of those projects, but identify appropriate delivery partners, funding pathways and asset owners for those investments
- By being agnostic to asset ownership, the model also retains flexibility to utilise the wide range of potential funding sources, including funding individual projects through:
  - Sydney Water customers for investments where Sydney Water is likely to be the natural asset owner
  - Rate payers where investments are strongly aligned with Council mandates, and through a relaxation of the cap on the Stormwater Service Charge (SMSC)
  - Existing NSW Government programs such as the NSW Coastal and Estuary Grants Program, for projects contained in a certified CMP
  - Federal Government funding for projects demonstrated to be of national significance.

Importantly, some sources that have not been used in the past for GSH waterway health merit further investigation. For example, The Federal Government provides funding for selected major infrastructure projects and environmental programs. The Department of Infrastructure, Transport, Regional Development, Communities and the Arts (DITRCA) co-funds infrastructure projects of national significance, which in theory could include nationally significant initiatives to manage stormwater impacts. The Department receives advice on the suitability of projects for federal funding from Infrastructure Australia, which is an independent agency that provides advice to the Department.

The establishment costs and ongoing operating costs would be met through contributions from government through consolidated revenue, with ongoing operating costs estimated to be up to $10 million per year. The partnership would also investigate alternative funding sources, such as the potential for a cruise passenger environment levy, to fund these costs. Such has proven to be implementable in other jurisdictions, such as New Zealand and Venice, where the funds raised from the levy are hypothecated to expenditure on environmental management actions.

Table 7 summarises the recommended governance and funding approach.

Table 1: Summary of governance and funding recommendation

	Summary of recommendation
Type of model	• Partnership between all levels of government, First Australians and Sydney Water • Establishment of an entity to develop an implementation plan and coordinate investments, and track and report progress
Partners	• NSW DPE • NSW EPA • TfNSW • NSW Treasury • First Australians advisory body • Sydney Water • Councils, through either a formal structure such as a JO or otherwise • Federal Government
Funding for entity establishment	• State and Federal Government funding contributions, from consolidated revenue

	Summary of recommendation
Funding for ongoing operation (excluding specific investments)	• State and Federal Government funding contributions • Investigate alternative funding sources, such as the potential for a cruise passenger environment levy
Funding for Water quality monitoring program (including analysis, modelling and decision support)	• Should be investigated as part of business plan/case • Sydney Water regulated revenue likely to be an appropriate funding pathway
Funding for investments in water quality initiatives	• Entity should investigate the appropriate asset owner for each investments and therefore the appropriate funding pathway that corresponds to that ownership, e.g.: – Sydney Water customers for investments where Sydney Water is likely to be the natural asset owner – Rate payers where investments are strongly aligned with Council mandates, and through a relaxation of the cap on the Stormwater Service Charge (SMSC) – Existing NSW Government programs such as the NSW Coastal and Estuary Grants Program, for projects contained in a certified CMP – Federal Government funding for projects demonstrated to be of national significance. • Funding complemented by NSW Government where investments within a certified CMP (i.e. through the NSW Coastal and Estuary Grants Program) or in alignment with state government policy and verified through a NSW Government business case • Funding complemented by Federal Government where demonstrated to be of national significance
Operation of water quality initiatives	• Sydney Water regulated revenue • Local Government through an increased SMSC

This recommended hybrid approach aims to utilise the strengths of various options considering during the study, while addressing some of their limitations. Elements of this approach have proven effective in other similar urbanised estuarine environments, while also catering to the specific context of the GSH.

An improved governance and funding approach for the GSH presents an opportunity to deliver investments that would not otherwise have been identified nor delivered, to address threats to the waterway health of what is widely recognised as an iconic and highly significant catchment to Australia.

Contents

Tables

Figures

Appendices

1 INTRODUCTION

1.1 Background

Sydney Coastal Councils Group (SCCG) in collaboration with Parramatta River Catchment Group (PRCG) is preparing a Coastal Management Program (CMP) for the Greater Sydney Harbour (GSH).

CMPs help local councils manage their coastal assets over the long-term by identifying key threats and outlining the actions required to address these threats. CMPs follow an integrated approach to coastal zone management, balancing and incorporating viewpoints from diverse fields, including coastal science, public finance and governance theory, in order to achieve optimal public policy outcomes. Importantly, CMPs allow councils to apply for funding from the NSW Government for coastal management actions contained in a certified CMP.

The GSH CMP vision is *"Improving and sustaining waterway health through improved coordination, consistency and leadership."* (BMT, 2018). It aims to tackle significant, complex challenges to improve the management of the harbour and its catchment. To meet this aim, the CMP will identify priorities for the management of the GSH environment and identify options to improve the health of the harbour.

The GSH CMP process is staged (refer to Figure 4). Stage 1 established the scope of the CMP and was developed by BMT (2018). Stage 1 identified stormwater as one of the key threats to the health of the harbour.

Previous research has identified stormwater as a major threat to waterway health. For example, the University of Melbourne's Waterway Ecosystem Research Group identified that stormwater *'is the primary driver of the degradation of streams, estuaries and embayments in Australia's cities, and indeed in cities around the world'* (Parliament of Australia, 2015). Also, the Cooperative Research Centre for Water Sensitive Cities highlighted the central role of stormwater management in affecting the three principles (pillars) of a Water Sensitive City being a supplier of:

4. Water resources
5. Ecosystem services
6. Social and institutional capital (Wong et al, 2013).

Stage 2, which is currently underway, will determine risks, vulnerabilities and opportunities, and at this time comprises the following studies:

- Study 1, which has been completed by Civille (2022), obtained information on different ways the 20 participating councils and state agencies are managing and funding stormwater activities within the GSH region, and the impediments to effective coordination.[2]
- Study 2 has investigated and recommended actions to improve the management of Greater Sydney Harbour.
- Study 3 (this study) has developed and proposed a funding and governance framework for stormwater management in the GSH (the Study).

[2] Since the time of that study, an additional Council (Strathfield) has joined the PRCG but their participation on the CMP process is yet to be confirmed.

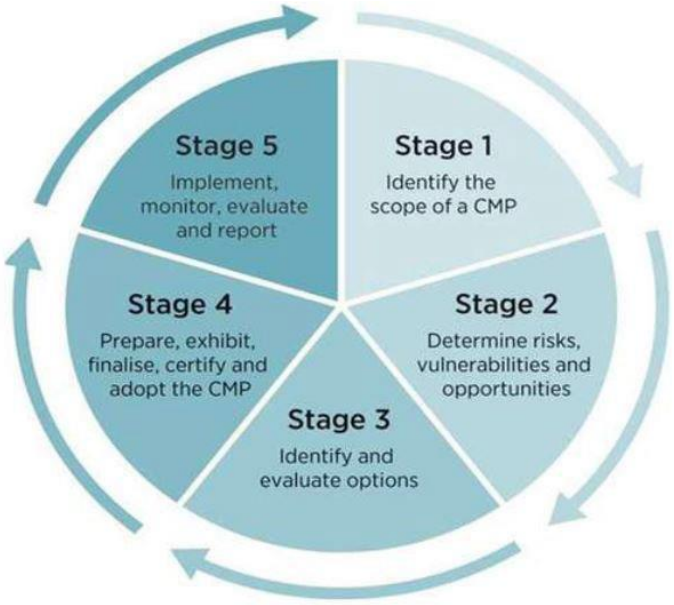


Figure 4 CMP Stages

SCCG engaged RPS Group to deliver Study 3 and this report summarises the results of that work.

1.2 Purpose of this study

Consistent with the recommendations of Stage 1, this study will focus on optimal governance and funding arrangements that are relevant in addressing stormwater runoff and its effects on Sydney Harbour. This is in the context of there being no apparent coordinating mechanism to support the efficient management of waterways and the potential harmful impacts of stormwater discharge.

Study 3 consists of three components:

1. A review of national and international experiences on governance and funding arrangements.
2. An appreciation of the theory on efficient investment, funding options and priority sources for the councils in the GSH catchment.
3. Future governance and funding options to improve waterway health on the GSH catchment.

Our review of governance and funding mechanisms has incorporated the findings of Stage 2 – Study 1 and any relevant findings from– Study 2 that have emerged, noting that Study 2 is still in progress.

On governance, Study 1 concluded that while the goals are clear, there is not a coordinated effort towards the management of diffuse stormwater pollution. One of the main contributors to this outcome is the fact that the responsibility for managing this issue is split across multiple councils and state agencies.

In terms of funding, Study 1 concluded that the funding is generally constrained, reliant on disparate approaches, prioritised towards stormwater drainage.

Table 2: Study 1 conclusions on governance and funding

Study 1 conclusions [a]	
Governance (Section 4)	**Funding (Section 5)**
1. Goals are clear. There is a clear message from the community identifying waterway health as a priority. Relevant objectives need to follow through in strategic and operational plans. 2. Vertical integration is lacking. Diffuse stormwater pollution by nature is a shared responsibly between levels of government. Accountability to strategies via actions between levels of government needs to be explicit, coordinated and tied to a standardised reporting framework. 3. Horizontal coordination is lacking. Without clearly defined coordination and assignment of responsibilities, each organisation is tending to pursue their own priorities. It is the sum of parts that will determine if the big picture goal of a healthy, swimmable and liveable Sydney Harbour can be achieved. This will require the coordination of actions working towards (scaffolding) catchment wide priorities. 4. The examination of existing local government policies and plans revealed an embedded gap between what they are doing and have prioritised and what could be described as an illusionary goal to achieve a healthy and in part swimmable Sydney Harbour. 5. While accountabilities for actions are often assigned to a lead agency/ies or to local government (generally), diffuse stormwater pollution by nature is a shared responsibly between levels of government. The absence of a coordinated monitoring and evaluation framework that is integrated between levels of government limits the capacity of catchment managers to understand what is actually being achieved.	1. Across all organisations and for all purposes, funding is constrained. Catchment managers have been forced to find and then rely on funding sources such as special rate variations, stormwater management charges and development agreements. Despite these sources of funding, stormwater quality largely remains underfunded relative to the community aspirations for clean waterways. 2. When stormwater quality competes with stormwater drainage for funding (as occurs with the SMSC), stormwater drainage tends to be prioritised. Managing the infrastructure backlog means prioritising renewals of ageing drainage infrastructure prior to investing in new projects. Furthermore, investment in stormwater quality is seen as discretionary, while investment in drainage is strongly embedded as a core function of local councils and Sydney Water. 3. Environmental special rates seem to be a better vehicle to raise revenue for stormwater quality outcomes, however this revenue pathway is used by less than half of the catchment councils. There are significant hurdles to implementing a new special rate variation, not least a need to demonstrate community willingness and ability to pay. Furthermore, these rates do not guarantee funding to address diffuse stormwater pollution – they can be allocated to other priorities. 4. When viewed at catchment scale, funding streams for stormwater and environmental purposes lack consistency. There does not seem to be any coordination between councils (horizontal) and local and state government with respect to strategic and operational funding for stormwater quality outcomes. There is an opportunity for IPART to play a more active and strategic role. 5. There is a lack of transparency in how funding is allocated and where it is being spent. Because stormwater quality (in most cases) lacks a dedicated funding stream, it is difficult to see how much is being spent in this area.

[a] Extracted from Civille (2022)

The ultimate outcome of Study 3 is a recommended governance and funding framework for the GSH catchment, following a consideration of potential candidate options informed by desktop review and consultation with stakeholders.

The recommendations aim to provide a pathway towards a collaborative model for both the governance and the suitable sustainable funding of the GSH catchment and estuary.

1.3 Greater Sydney Harbour context

The GSH area covers Sydney Harbour, as well as the freshwater and estuarine environments of the rivers and tributaries that ultimately drain into the harbour. The waterways in the area (refer to Figure 5 below) have highly significant recreational, scenic and economic values for Sydney, NSW and Australia.

The Parramatta River is the main tributary to Sydney Harbour. Land-use around the river has been heavily developed and has a long history of industrial activity, which has contributed to water quality issues into the harbour.

The catchment includes the current economic centre of the Sydney, being the Sydney Central Business District (CBD), as well as the emerging Parramatta CBD. As such, the catchment includes two of the three centres defined by the Greater Sydney Commission (GSC) - Greater Parramatta (the 'Central City') and the Harbour CBD. The GSC visions include an increasingly important role for Greater Parramatta has a social and economic hub.

Figure 5 shows the boundary of the area defined as the GSH.

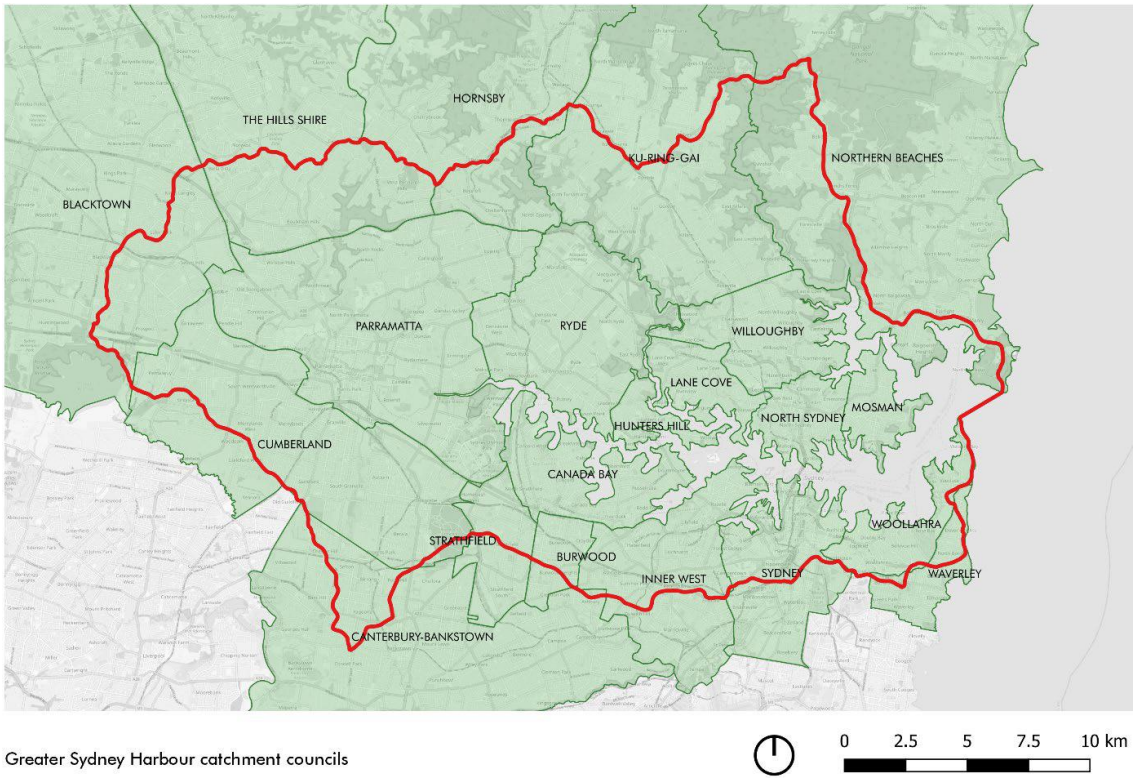


Figure 5 Greater Sydney Harbour catchment

The catchment contains parts of 21 Local Government Areas (LGAs), 20 of whom are participating in Stage 2 of the CMP process.

Sydney Harbour is recognised as an iconic and valuable part of the NSW marine estate.[3] However, the Sydney Harbour Water Quality Improvement Plan identified that (Freewater & Kelly, 2015):

- Sediments in the harbour contain dioxins that led to a complete ban on all commercial fishing, as well as advice to recreational fishers to not eat fish or crustaceans caught west of the Sydney Harbour Bridge, and significantly limit the consumption of fish caught east of the bridge to no more than 150 grams per month
- Thousands of tons of pollutants continue to enter the harbour through the stormwater discharge system and sewage overflows
- Stormwater is the major threat to the ecological integrity of the Sydney Harbour, threatening the wide social, environmental and economic benefits the waterway provides.

1.4 Study Approach

Our approach to recommending an optimal governance and funding framework for the CMP, included three main phases:

[3] https://www.marine.nsw.gov.au/marine-estate-programs/sydney-harbour

- **Phase 1:** Framing and background review
- **Phase 2:** Research of relevant governance and funding mechanisms
- **Phase 3:** Testing and refinement of options with stakeholders.

Phase 1: Framing and background review

The Study commenced with an inception meeting and detailed workplan, which was approved by members of the Project Control Group (PCG) and the Project Management Committee (PMC).

The phase concluded with a review of studies 1 and 2, and any other relevant background identified at the inception meeting, to ensure the team has a full appreciation of the context and the findings of the project to date. These prior studies provided important context on the GSH catchment and the current approaches to stormwater management applied by councils within the catchment.

Phase 2: Research of relevant governance and funding mechanisms

In Phase 2, RPS completed a desktop review of relevant case studies relating to governance and funding for Natural Resource Management (NRM), with a focus on how stakeholders from those catchments have developed governance and funding arrangements that successfully deal with the issue of water quality.

Phase 3: Testing and refinement of options with stakeholders

We have arrived at a recommended governance and funding framework after discussing the options with the Project Control Group (PCG), Project Management Committee (PMC) and other relevant stakeholders.

We facilitated this testing by conducting two approximately 2-hour workshop with relevant attendees.

The first workshop was an options workshop and included:

- Presentation of high-level template (straw-person) options to the PCG and PMC
- Obtaining feedback on those options from the workshop participants.

At the second workshop, RPS presented a Proposed Option based on further analysis and feedback on the straw-person options, for testing with the PMC. The PMC provided further feedback on this option at the workshop. This further feedback was considered in the development of a final recommendation option by RPS.

2 PROBLEM DEFINITION

To guide the identification of a suitable/recommended governance and funding framework, the RPS team first developed a problem definition that summarises the issues with existing arrangements.

This Study identified three inter-related problems that lead to the lack of clear and effective governance, and the inadequate funding for the GSH catchment. These are as follows:

4. The entities that are able to deliver solutions lack the direct incentives/responsibility to deliver them.
5. Existing funding frameworks have targeted focuses or limitations.
6. The entities that are able to deliver solutions lack the organisational capacity to deliver them.

2.1 Problem 1: Incentives

Currently, some entities that deliver solutions (e.g. Local Government) lack the direct market-based incentives for investment.[4] This issue can be characterised using the concept of market failures, which refer to the situation where there are opportunities to invest in actions that provide a net benefit to the community, however certain barriers prevent stakeholders from delivering those actions

Stormwater management, or diffuse source water pollution management, can be characterised as a market failure, as with most forms of water pollution. Economic studies have identified that addressing the market failure is likely to be in the public interest and justify intervention by government, as the benefits outweigh the costs (e.g. Frontier Economics & Alluvium, 2019).

Local governments have the ability to deliver and are delivering, contingent on funding, stormwater management solutions, however:

- The benefits of efficient stormwater investment accrue to both those within and outside of the council area, which is a market failure referred to as an externality (positive externalities)
- The community may not understand the importance of effective stormwater management and how it affects their quality of life, which is a market failure referred to as an information problem
- Local governments cannot always justify raising the revenue to collect.

Moreover, State Government does not have a dedicated program for funding stormwater management.[5] That said, the NSW Coastal and Estuary Grants Program, which is the program supporting this CMP process, does provide grant funding and knowledge for coastal management activities, albeit it has a much broader scope. It should be noted that the program generally requires one Council to take the lead on a CMP, however recent changes to the guidelines allow for a Regional Organisation of Councils (ROC) to submit a CMP.

Sydney Water's primary role has been to manage parts of the trunk drainage system. However, the organisation has played a broader role in integrated water management at times. Example of this include the Waterway Health Improvement Program (WHIP), as well as the installation of more than 70 stormwater quality improvement devices (SQIDs).[6]

In performing these roles, Sydney Water has largely operated with its regulatory frameworks, in terms of both economic and environmental regulation. In terms of economic regulation, the organisation is incentivised to deliver water and wastewater services to its customers as efficiently as possible. In terms of environmental

[4] Examples in some jurisdictions have included market based instruments (MBI), which involve the creation of a market for an environmental good (e.g. water quality) by placing an obligation to purchase MBIs on those who impact the environment and/or a mechanism to generate and sell MBIs for those how benefit the environment. A range of MBIs have been used to incentivise positive environmental outcomes in a range of sectors. Carbon trading schemes and renewable energy certificates are well known examples. An example in the water sector is the Hunter Salinity Trading Scheme (https://www.epa.nsw.gov.au/licensing-and-regulation/licensing/environment-protection-licences/emissions-trading/hunter-river-salinity-trading-scheme).

[5] This was a deliberate decision by the NSW Govt when it introduced the stormwater levy in 2006, in the expectation that this would provide councils with a secure, dedicated source of funding.

[6] https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/stormwater-network.html

regulation, Sydney Water must comply with the requirements of its Environmental Protection Licence (EPL). Moreover, wastewater management regulation aims to reduce pollution of stormwater to receiving waters. Both regulatory frameworks do not necessarily require addressing broader stormwater quality issues and their impacts on the GSH.

More broadly, there do not appear to be other entities that have the combination of incentives and access to funding for stormwater management. Some entities (e.g. Environment groups, NGOs, private sector, Federal Government etc.) either currently have the motivation or the capacity, but not both. That said, the national significance of the GSH is likely to be of importance to the Federal Government.

This lack of incentive for investment, and absence of coordination to achieve investment, has been identified in other jurisdictions such as New Zealand (Severinsen, 2020), which has led to calls for the development of a dedicated authority (e.g. an Urban Development Authority).

2.2 Problem 2: Limitations in current funding

There is currently a wide range of funding sources for stormwater management, including at the Federal, State and Local Government levels. However, the funding approach is piecemeal and each source of funding addresses selected issue(s).

The Federal Government provides funding for selected major infrastructure projects and environmental programs. The Department of Infrastructure, Transport, Regional Development, Communities and the Arts (DITRCA) co-funds infrastructure projects of national significance, which in theory could include nationally significant initiatives to manage stormwater impacts. The Department receives advice on the suitability of projects for federal funding from Infrastructure Australia, which is an independent agency that provides advice to the Department.

More broadly, Australian Government initiatives have included the:

- National Landcare Program (NLP), which provides funding for Natural Resource Management (NRM) projects around Australia. For example, the NLP provides funding support to Local Land Services (LLS) in NSW, as well as to the Healthy Land and Water program in Southeast Queensland.
- Caring for our Country program, which funded the Botany Bay & Catchment Water Quality Improvement Plan (to meet Federal Government responsibility for RAMSAR listed wetlands at Towra Point).
- Environment Restoration Fund, which provides funding for a broad range of environmental priorities including water quality, and has funded the management of gross pollutants in the Georges River.

One of the limitations of the infrastructure funding is that the federal funding sources tend to fund capital expenditure but not ongoing operating expenditure, leaving a gap to be funded through other sources. This is also the case with NSW Government sources such as the NSW Coastal and Estuary Grants Program, where funding is available to be put towards capital expenditures only.

In general, higher levels of government implicitly or explicitly rely on local governments, including through developers, to fund stormwater measures. The NSW Coastal and Estuary Grants Program requires local governments to fund between a third to half of capital expenditure.[7]

Other than federal or state funding, available funding sources include:[8]

- **Stormwater Management Service Charge (SMSC):** The size of the SMSC has been fixed in nominal terms at $25 per property since 2006. As such, the real (i.e. inflation-adjusted) value of the funding has decreased significantly in real (inflation-adjusted terms) over the last 16 years. The cap for this charge is defined within NSW legislation (*Local Government Act 1993*) and there do not appear to be explicit plans underway to lift this cap.
- **Environment or Sustainability Levy:** Civille (2022) found that 8 Councils within the GSH region charge some form of environmental levy, raising a per capita revenue ranging from $1.48 to $81.12 per capita. One of the main challenges with this form of funding is its need for acceptance by the community and that if the dominant purpose of the levy is stormwater management, councils are unable to also

[7] $2 state contribution for $1 local government (2 for 1) or $1 state contribution for $1 (1 for 1)

[8] Refer to Civillie (2022) for a more detailed explanation and discussion of each mechanism.

charge the SMSC to avoid duplicating the cost impact to residents. As these levies are applied in addition to ordinary rates, they are not always supported by council residents.

- **Developer contributions:** A proportion of the contributions from developers are channelled towards stormwater drainage projects but are also able to fund stormwater quality improvement projects. These contributions are made in accordance with the *NSW Environmental Planning and Assessment Act 1979*, or as Voluntary Planning Agreements (VPAs).
- **Sydney Water Stormwater Service Charge:** Sydney Water has stormwater drainage responsibility from a proportion of catchment areas within Greater Sydney.[9] Sydney Water charges properties within these catchments a Stormwater Service Charge (for 2022-23 this is $20.78 and $ 6.64 per quarter for houses and units respectively). However, most of the funding from this charge, which is regulated by NSW Independent Pricing and Regulatory Tribunal (IPART), is focused on asset renewal including naturalising channelised waterways, and not stormwater quality.
- **Waterway Health Improvement Program (WHIP):** From 1 July 2022, Sydney Water also commenced charging customers within its stormwater catchment an additional 90 cents a year on top of the SMSC rate above, approved by IPART, to fund Water Sensitive Urban Design (WSUD) and other water quality improvement projects.

The range of funding mechanisms described above have different focuses, and are charged or collected from different households in Sydney, or from NSW or Australian Government consolidated revenue as the case may be. In some cases, neighbouring households that span Council or stormwater catchment boundaries can pay widely different contributions for a similar level of service. Moreover, Civille (2022) reported Councils' perspectives to be that overall, the funding for stormwater management is highly constrained. Finally, while stormwater drainage appears to be adequately funded, although further analysis would be required to confirm this, there is a shortfall in funding for stormwater quality management. This can be evidenced by reference to Council's asset management plans, although the underlying data and assumptions regarding asset lifecycle and need for asset upgrades or new assets, needs to be continually improved.

2.3 Problem 3: Lack of organisational capacity

Effective governance frameworks include parties that have both the authority and the resources to perform their functions, or if they do not have the resources, they have the means to acquire them (Alluvium & NCE, 2019). That is, the parties have the capacity to fulfil their functions within the framework.

Van de Meene (2010) provides a useful overview of the types of capacity inherent in the context of sustainable urban water government. Capacity, in the context, can refer to the individual, intra-organisational, inter-organisational and/or administrative & regulatory capacity (van de Meene, 2010, p.50).

Individual capacity includes the knowledge, skills and motivation of the individuals within the organisation. Intra-organisational capacity includes the culture, management practices and procedures. Inter-organisational capacity comprises organisational relationships, their structure and operation. Finally, the administrative & regulatory capacity is characterised by the formal rules and incentives, as well as the legal and policy instruments.

The Study 1 report provides many reasons why councils are capacity constrained with respect to stormwater management, including (Civille, 2022):

- **Fragmented responsibilities:** Responsibilities are spread across different parts of the organisation. While this is appropriate because stormwater is a complex problem, the means that each team struggles to dedicate adequate resourcing to stormwater issues because of the other responsibilities each team has.
- **Organisational change:** The issue of insufficient resourcing has been compounded by the organisational changes triggered as result of the NSW council amalgamation process in 2016.

[9] https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/stormwater-network/stormwater-catchment-map.html

- **Inter-organisational collaboration:** Councils do occasionally work with neighbouring councils but do this in an ad-hoc manner on selected projects. Catchment scale collaboration occurs through groups like the PRCG and SCCG but councils have acknowledged that these groups have limited funding.
- **Capacity building:** Some of the better-resourced councils have been able to access resources related to new and innovative stormwater management practices, and how much funding is required to improve stormwater quality, but others have not.

Outside of the federal, state and local governments, the other entity with the capacity for stormwater management in the GSH is Sydney Water, who does have strong internal capability and technical expertise. Moreover, its legislative and regulatory obligations are evolving to also include additional environmental outcomes into pricing, there is a statement of expectations for Sydney Water, and there has been the introduction of risk-based approaches to prioritise investments to reduce wastewater overflows.

However, Sydney Water's main role, as currently defined by the relevant regulatory frameworks, is to deliver its services in a cost effective manner to consumers while meeting the requirements of the relevant environmental regulations. As such, while it has and will likely continue to play a broader role in stormwater management, Sydney Water's focus, under current settings, will be guided by its legislative and regulatory obligations.

2.4 Problem statement

The rationale for a revised governance and funding framework can be established by consolidating the above characterisations of the problem into a problem statement as follows:

> "The responsibilities for managing stormwater quality and its impacts on the GSH are spread across various levels of government, developers and utilities, and are funded through a range of sources. Each organisation addresses discrete issues and while there is some inter-organisation collaboration, this is limited to selected projects. The current model does not provide for a long-term and sustainable funding mechanism with clear responsibility for catchment wide issues that affect the health of GSH waterways."

This problem statement is strongly aligned with the characterisation of the problem in Study 1 (Civille, 2022), as well prior work. For example, the Productivity Commission (2020) outlined the problems in the context of Integrated Urban Water Management being:

- There are barriers to effective collaboration
- Roles and responsibilities for providing enhanced amenity are unclear
- There is a lack of clear objectives for water-related aspects of enhanced urban amenity.

3 REVIEW OF RELEVANT CASES

3.1 Importance of governance and sustainable funding

Establishing an appropriate governance and funding framework is fundamental to achieving desired outcomes associated with any environmental policy objectives. Without the right framework, the responsibilities are not clear and/or sufficient funding required to fulfill those responsibilities is not available.

Van de Meene and Brown (2009) stress the importance of governance and 'socio-institutional systems' in achieving the goals of sustainable urban water management, and that it is the co-evolution of socio-institutional systems with technical systems that enable a system-wide transition. The authors note that the traditional top-down and command and control management approaches have progressively been evolving to include more market-based approaches.

The historical governance approach in NSW has generally been hierarchical in nature, with the establishment and then dissolution of the CMAs, the work of Local Land Services (LLS) and the ROCs.

Organic development vs externally imposed structures

Governance structures in the various jurisdictions reviewed appear to have developed organically without government intervention and through voluntary group collaboration on the one hand, or intentionally by government.

What is also apparent through the review of these case studies is that in some cases, the organically developed structures have proved to be effective while in others they have not. This suggests that there is a case for establishing more formal structures in cases where, even if structures have developed organically, they are not proving effective.

Funding approaches, efficiency and equity

There are two aspects of funding to consider. The first is the amount of funding needed to invest in measures required to meet objectives. The second is the source of the funding and the form of the funding instrument (e.g. levy, grant, user charges etc.).

This study focuses more on the latter (i.e. the source and form of the funding instrument). The amount of funding required and what this should be directed to will be further explored in Stage 3 (Identify and evaluate options), as well as through ongoing development and subsequent implementation of the CMP. However, for the funding to be sustainable, this study has concluded that it needs to be:

- Sufficient to cover both the capital and ongoing costs of measures
- Obtained from a source that has some stability (i.e. is not a temporary source of funding that risks becoming unavailable in the future).

In terms of the appropriate source and form of the funding, the review considered several potential options for the funding of waterway health programs. Each of these options have their advantages and disadvantages. Ultimately, two of the key considerations for funding instruments is that they should promote efficient investment (economic efficiency) and be perceived as equitable (equity).

Economic efficiency

An investment is considered economically efficient if it provides a net benefit to society (i.e. benefits in excess of costs). The benefits and costs can be either be valued in markets (e.g. clean drinking water) or have a so called non-market value because people don't explicitly pay a market price for the outcome (e.g. a swimmable river). Economically efficient investments improve the wellbeing of a community as a whole.[10] In

[10] In practice, a policy or project is economically efficient even if there are winners and losers, as long as the gains to winners outweigh the losses to losers. A policy that that makes at least some community members better off without making anyone worse off is called 'Pareto efficient'. Pareto efficient policies or projects are rarely possible in practice.

the context of stormwater, an economically efficient investment would be one where the monetised water quality benefits and other co-benefits exceed the cost of the investment.

The approach to funding can have a positive or a negative impact on economic efficiency. In theory, a funding instrument that aims to address an externality (e.g. a levy or permit for stormwater discharge) should be priced at the value of that externality (i.e. the economic cost of the damage created by the discharge) to be economically efficient.

Setting the price of the instrument at the right level, also provides incentives for efficient investment. For example, if mitigating discharge is more cost effective than paying the levy, the private sector will have an appropriate incentive to invest in mitigation measures.

Equity

Equity is more subjective and relates to whether stakeholders perceive a proposal to be fair. While subjective, achieving equity can be extremely important for the success of a policy because in many cases, public support and approval is required to implement the policy.

Beyond efficiency and equity

The success of a policy will be determined by further considerations beyond these two. These include the likely complexity, implementation practicality of the proposal, among other considerations. Due to the breadth of factors that determine success, the identification and recommendation of a preferred governance and funding framework has been based on assessment framework incorporating a breadth of assessment criteria (outlined in Section 4.2).

3.2 Approach to review

Case studies were identified through desktop research and input from the PCG and PMC. For example, Alluvium & NCEconomics (2019) reviewed several case studies to inform their development of options for a governance and funding framework for the Richmond River in Northern NSW.

Frontier Economics & Alluvium (2019) investigated funding options for the management of diffuse source water pollution in NSW. As part of that investigation, the authors discussed funding instruments, as well as governance structures, used in other urban estuarine environments.

Sarah Joyce, Bruce Thom and Ana Terrazas from the SCCG, and members of the PCG and PMC, suggested a number of case studies for RPS to consider.

3.3 Evolution of waterway management in GSH

Since European colonisation, the waterways of the GSH catchment experienced multiple challenges with scarcity and pollution as Sydney grew and the community gained a greater awareness of waterway health. This saw the development of various water supply and sewerage schemes, and the establishment of organisations such as The Sewerage and Health Board in 1875.[11]

The Sydney Water Board was formed in 1987 as a statutory authority and water utility for the Sydney catchment. The Managing Director and the board of directors were selected by the Minister (McClellan, 1998). The Board played both an operational and regulatory role.

The driver to reform the Water Board included the microeconomic reform agenda of the 1990s, which led to the corporatisation of the utility as Sydney Water, the establishment of a commercial framework and market prices of water services (ibid).

The Sydney Catchment Authority (SCA) was formed in 1999, following events that led to Cryptosporidium and Giardia contamination of Sydney's water supply. The SCCMA was one of 13 CMAs across NSW. The SCA was a statutory authority formed to manage and protect drinking water quality in the Sydney catchment

[11] https://www.sydneywater.com.au/content/dam/sydneywater/documents/education/sydney-water-timeline.pdf

area. It was dissolved in 2015, with some of its functions assumed by the newly formed WaterNSW, which became responsible for the bulk supply of water for the state.

WaterNSW's outlines its catchment management role in NSW as:[12]

- Science and research
- Enforcing laws
- Providing grants and incentives
- Education and training
- Land improvement work.

Today, Water NSW operates capacity building programs for Councils within the drinking water catchment and delivers WSUD projects to improve water quality.

NSW also operated 13 Catchment Management Authorities (CMAs), which were statutory bodies whose roles were to coordinate NRM in each of their respective catchments. The Sydney Metropolitan Catchment Management Authority (SMCMA) was responsible for the Sydney catchment. Its functions have been subsumed into LLS.

Catchment management in NSW has also included the occasional formation of specific entities such as The Upper Parramatta River Catchment Trust (UPRCT). The trust was funded through a charge on Sydney Water's bills for customers in the trust area, and focussed on capital works to mitigate flooding and capacity building. The legislation that established the trust was ultimately repealed.

The history and evolution of catchment management in NSW show that even with statutory backing, many organisations responsible for catchment management in the GSH have not lasted. The current approach to catchment management as outlined in the Study 1 report is a spread out over a number of different organisations (Civille, 2022).

3.4 Overview of case studies reviewed

The review of example governance and funding frameworks focused on those that were in place to manage water quality impacts in urban estuarine environments. As such, the case studies considered included:

- Melbourne
- Southeast Queensland (SEQ)
- The River Thames, London, United Kingdom
- Chesapeake Bay, which near Washington DC, United States
- San Francisco Bay, United States
- The Hudson River Keeper, New York, United States
- The Derwent Estuary Program, in Tasmania
- The Georges River Keeper
- Council partnerships / council groups (SCCG, PRCG, Rous County Council, Northern Rivers Joint Organisation of Councils (JOC))
- Management of river basins in Denmark.

Of these case studies, Melbourne, SEQ, Chesapeake Bay and the Thames were the most instructive because in the case of:

- Melbourne and SEQ, these involve Australian capital cities with major rivers draining into a bay/harbour
- Chesapeake Bay, it involves a water body of strong national significance

[12] https://www.waternsw.com.au/water-quality/education/learn/catchments-managed

- Thames, there have been interventions that have proven highly effective in transforming a waterway such that there are likely to be valuable lessons learnt.

The main body of the report discusses the above cases in somewhat greater detail. However, Appendix A provides further discussion relating to the remaining case studies.

3.5 Relevant Australian case studies

Melbourne

The Yarra River in Melbourne is 242 km long, running from Mt Baw Baw north-east of Melbourne and emptying into Port Phillip Bay. The river supplies 70 per cent of Melbourne's drinking water and also supports agriculture, as well as recreational activities such as rowing, fishing, bird watching, picnicking and walking. The river supports a wide diversity of habitats for plants and wildlife.

Responsibilities for managing water quality in the Yarra and Port Phillip Bay

Victoria has established a framework for integrated catchment management, underpinned through legislative provisions within the *Catchment and Land Protection Act 1994* (the CaLP Act). The CaLP Act enables the establishment of catchment and land protection regions, which have been defined as the following:

- Corangamite
- East Gippsland
- Glenelg Hopkins
- Goulburn Broken
- Mallee
- North Central
- North East
- Port Phillip and Westernport
- West Gippsland
- Wimmera

The primary responsibility for managing each catchment is assigned to a Catchment Management Authority (CMA). The CMAs are responsible for integrated planning, development of catchment strategies, and taking action to protect the health of the land and waterways (e.g. through Water Sensitive Urban Design (WSUD) projects).

Funding for catchment management

CMAs are funded through the (DELWP, 2016):

- Federal Government's National Landcare Program
- Victorian Department of Environment, Land, Water and Planning (DELWP)
- Victorian Landcare Program, which in turn is funded through a mix of state government and private sources.

CMAs also receive funding for specific initiatives through Environmental Contributions (EC), which are funds collected by water supply authorities. The EC funding supports sustainable water management initiatives such as WSUD, council resourcing and capacity building, research and flood resilience, among other initiatives.

Melbourne Water's appointment as CMA

In 2021, the Victorian Government made the decision to appoint Melbourne Water as the CMA for the Port Philip and Western Port region, and to integrate it with the previous Port Philip and Western Port CMA (PPWCMA).

As part of its catchment management role, Melbourne Water funds services and programs that support healthy rivers and creeks, and funds these activities through the Waterways and Drainage Charge to customers within the CMA region. The charge is approximately $110 per year for residential customers, $165 per year for non-residential customers and $60 per year for rural customers.[13] It should be noted that these charges are collected directly from customers and visible on their water bill, and are in addition to the EC that Melbourne Water would be paying as a water supply authority, which would be implicitly incorporated into the other water and wastewater service charges.

Other aspects of Victorian framework relevant for this study

Other positive aspects of the Victorian approach that were noted by stakeholders interviewed as part of the study were:

- The General Environmental Duty established in the *Environment Protection Amendment Act 2018 (Vic)*, which requires businesses and individuals to take reasonably practical steps to avoid risk to human health or the environment from pollution or waste
- Melbourne Water has historically had a significant responsibility and role in integrated water cycle management.

Southeast Queensland

Healthy Land and Water (HLW) is a long-standing catchment scale monitoring and management program, which has participation from councils, academic and research institutions, state and federal governments, non-government organisations, utilities and the private sector.

HLW has a strong focus on monitoring and reporting through its Ecosystem Health Monitoring Program (EHMP). The EHMP provides a comprehensive and scientifically robust assessment of the major SEQ catchments, river estuaries and Moreton Bay zones. The results of the monitoring are summarised and communicated through annual Report Cards, which grades/rates:

- Environmental condition
- Waterway benefits
- Recommended management actions.

Roles and responsibilities

The program has established a governing Board and the following committees, whose members are drawn from the participating organisations, including:

- Risk and Audit Committee
- Science Committee
- Indigenous Engagement Steering Committee
- Senior Executive Advisory Committee.

The organisation has a dedicated Chief Executive Officer (CEO) and the website lists the current Board Chair as Stephen Robertson, from Planet Ark Power.

[13] https://www.melbournewater.com.au/about/prices-and-charges/waterways-and-drainage-charge/waterways-and-drainage-prices

The objectives of the committee extend beyond monitoring and reporting, and include ensuring that the waterways are fit-for-purpose for a wide diversity of uses spanning from agricultural, to ecological, to recreation.

Funding

HLW is funded partially through the Federal Government NLP. The organisation's 2021 annual financial report listed its revenue sources, in order of significance, as (Healthy Land & Water, 2021):

- Federal, State and Local Government
- Membership revenue
- Income from Corporates and other sources, including state and local governments, as well as corporate utilities
- Other income and dividends.

A noteworthy feature of the model is that it appears to have evolved over decades organically from small catchment management partnerships into a much larger, multi-party and broadly funded organisation that it is today. The organisation enjoys participation from all councils in the Brisbane catchment.

3.6 Relevant international case studies

Chesapeake Bay

The Chesapeake Bay is the largest estuary in the United States. It runs north-south from the mouth of the Susquehanna River to the Atlantic Ocean. It is one of the most productive estuaries in the world, with over 3,600 species of animals and plants. The bay provides vitally important habitats for wildlife, lots of recreational opportunities for people, and is an important fishery upon which both people and wildlife depend.[14]

The protection and restoration of the Chesapeake Bay and its streams and rivers supports its regional economy. The Bay provides economic and other benefits from its fishing, tourism, real estate, and shipping industries.[15]

A congressionally funded study by the United States (US) Government in the 1970s led to the formation of the Chesapeake Bay program. Establishment of the program has subsequently led to:

- Setting of numerical pollutant goals for the health of the bay
- Signing of the 1987 Chesapeake Bay Agreement by District, State and Federal Governments
- Establishment of multi-lateral agreements, including Memoranda of Understanding (MOUs) to cement the partnerships.

This framework has led to the development of Management Strategies to achieve agreed restoration outcomes by 2025.

Responsibilities for managing water quality in Chesapeake Bay

Excess nutrients, primarily nitrogen and phosphorous, and sediment have played a major role in the impairment of the Chesapeake Bay ecosystem. These nutrients come from a variety of sources and land uses, including septic systems, municipal wastewater, storm water runoff from growing urban and suburban areas, as well as agricultural contributions from livestock, cropping and forestry operations.[16]

[14] *https://www.nwf.org/Educational-Resources/Wildlife-Guide/Wild-Places/Chesapeake-Bay*

[15] *https://www.cbf.org/issues/what-we-have-to-lose/economic-importance-of-the-bay/*

[16] https://www.chesapeakebay.net/content/publications/cbp_12614.pdf

Table 3 summarises the responsibilities of the key agencies involved in the management of Chesapeake Bay water quality.

Table 3: Chesapeake Bay responsibilities

Agency	Responsibility
The Environmental Protection Agency (EPA)	Define the next generation of tools and actions to restore water quality in the Chesapeake Bay and describe the changes to be made to regulations, programs, and policies to implement these actions
Department of Agriculture (USDA)	Target resources to better protect the Chesapeake Bay and its tributary waters, including resources under the Food Security Act of 1985 as amended, the Clean Water Act, and other laws
Department of Defence (DOD)	Strengthen storm water management practices at Federal facilities and on Federal lands within the Chesapeake Bay watershed and develop storm water best practices guidance
Department of Industry (DOI)	Expand public access to waters and open spaces of the Chesapeake Bay and its tributaries from Federal lands and conserve landscapes and ecosystems of the Chesapeake Bay watershed.
DOI and Department of Commerce (DOC)	Assess the impacts of a changing climate on the Chesapeake Bay and develop a strategy for adapting natural resource programs and public infrastructure to the impacts of a changing climate on water quality and living resources of the Chesapeake Bay watershed. Strengthen scientific support for decision-making to restore the Chesapeake Bay and its watershed, including expanded environmental research and monitoring and observing systems. Develop focused and coordinated habitat and research activities that protect and restore living resources and water quality of the Chesapeake Bay and its watershed.

Source: Chesapeake Bay Executive Order (https://obamawhitehouse.archives.gov/realitycheck/the_press_office/Executive-Order-Chesapeake-Bay-Protection-and-Restoration)

Funding sources and uses

Funding for restoration efforts comes from numerous federal agencies, state and local governments, non-governmental organisations and private interests. The state and local government funding comes from the various Chesapeake Bay Program partners from the states of Delaware, Columbia, Maryland, Pennsylvania, Virginia and West Virginia. Further funding comes from the federal level through the leadership committee for the Chesapeake Bay: EPA, department of Agriculture, Department of Commerce, Defence, Homeland Security, Interior and Transportation.

Most of the $87 million funding (around two-thirds), which is administered by the US EPA, is provided to state governments, local governments and other partners to support them in meeting the goals of the Chesapeake Bay Total Maximum Daily Load (Bay TMDL) and the Chesapeake Bay Watershed Agreement.[17]

Examples of grants provided by the program are grants provided under the *Innovative Nutrient and Sediment Reduction Grants Program*, which awards grants of $200,000 to $1 million to support innovative, sustainable and cost-effective approaches to significantly reduce nutrient and sediment pollution to the Chesapeake Bay and its local waterways.[18]

Projects supported by these grants include:[19]

- Installing streamside buffers, that reduce nutrient and sediment pollution to the Bay
- Regional collaboration to identify innovative solutions to managing nutrient and sediment pollution
- Technical assistance to help landowners develop conservation plans for their property

[17] https://www.chesapeakebay.net/who/funding_and_financing

[18] https://www.chesapeakeprogress.com/funding

[19] https://www.cbf.org/about-cbf/locations/washington-dc/legislative-priorities/the-epas-chesapeake-bay-program.html

- Promotion of community-based efforts to protect the natural resources of the Bay and its rivers and streams

Impact of the program

The program has reportedly provided a significant reduction in nutrient pollution, by reducing nitrogen to the Bay by an estimated 57 per cent and phosphorus by 75 per cent. [20] The success of the program has led to it being perceived as one of the most successful programs in the US for reducing nutrient pollution from water treatment plants.

Complementing the pollution reduction components, is The Chesapeake Bay Monitoring Program. The monitoring program commenced in 1984 and covers 19 physical, chemical and biological characteristics, monitored 20 times a year in the Bay's main stem and tributaries, including:

- Freshwater inputs
- Nutrients and sediment
- Chemical contaminants
- Plankton
- Benthos
- Finfish and shellfish
- Underwater Grass
- Water temperature, salinity and dissolved oxygen.

River Thames

The Thames River is clearly a waterway of significant importance to London, and likely the entire United Kingdom (UK). The river is 229 miles long, and runs from Kemble in Gloucestershire to Southend-on-Sea in Essex, ultimately flowing into the North Sea.[21]

The river estuaries are important for ecological, consumptive and productive reasons. It is relied on by millions of Londoners, as well as being home to several wildlife species, including:

- 115 different species of fish
- 92 species of birds.

The Thames has faced numerous pressures over its life, having historically been a repository for sewerage waste. Efforts to clean up the Thames started in 1858, through the upgrading of the sewage treatment works and installation of household toilets linked to the system.

Much of this infrastructure was largely destroyed and/or damaged as a result of World War 2. Further mismanagement of the river led to the Thames being declared 'biologically dead' by scientists at the Natural History of Museum of London in 1957, implying that the river was unable to sustain any life form and wildlife.[22]

Over the last century, a significant amount of policy effort has supported a transformation of the river. All sewage entering the Thames was required to be treated from 1976. Further legislation introduced between 1961 and 1995 progressively introduced more stringent water quality standards.[23]

[20] https://www.chesapeakebay.net/what/programs/monitoring

[21] *https://theconversation.com/from-biologically-dead-to-chart-toppingly-clean-how-the-thames-made-an-extraordinary-recovery-over-60-years-180895*

[22] *https://www.azocleantech.com/article.aspx?ArticleID=1457*

[23] *https://scroll.in/article/1022414/how-the-thames-went-from-being-biologically-dead-to-one-of-the-worlds-cleanest-rivers-in-60-years*

Responsibilities for managing water quality

Table 4 summaries the relevant agencies in the UK and their associated responsibilities in managing the water quality for the River Thames estuary.

Table 4: Responsibilities for managing water quality in the Thames

Agency	Responsibility
Office for Environmental Protection	Improve water quality in rivers
Department for Environment, Food & Rural Affairs (DEFRA)	• Establishment of environmental policies and programs • The Drinking Water Inspectorate (DWI), who acts on behalf of the Secretary of State for DEFRA, regulates the water quality of the drinking water
Environment Agency	The Environment Agency is responsible for: • Regulating major industry and waste • Treatment of contaminated land • Water quality and resources • Fisheries • Inland river, estuary and harbour navigations • Conservation and ecology
UK Centre for Ecology and Hydrology	The UK Centre for Ecology and Hydrology is responsible for the monitoring and reporting of the water quality of the river Thames.
Thames Water	Thames Water responsibility is to: • Clean water at treatment works • Deliver water to customers' homes via network of pipes • Remove wastewater from homes and businesses • Treat wastewater at sewage treatment works • Safely return clean water to the environment.

Sources: UK Government (https://www.gov.uk/government/organisations/environment-agency/about#responsibilities), Thames Water(https://www.thameswater.co.uk/media-library/home/about-us/investors/our-finances-explained-nov-19.pdf)

Of particular note for this study is the potential role of the Office of Water Protection. Prior to the UK exiting the European Union (EU), the top-down directions for water quality were provided by the European Union's (EU) Water Framework Directive (WFD), which encouraged *"cooperation and joint objective-setting across Member State borders"*.

The Office of Water Protection was formed following the exit from the EU and the development of *The Environment Act 2021* legislation. The recent House of Commons inquiry into Water Quality in Rivers in England noted that *"The new Office for Environmental Protection, established under the Environment Act 2021, is empowered to make highly significant contributions to the achievement of the Government's environmental objectives in general, and to the improvement of water quality in rivers in particular.* (House of Commons, 2022).

This highlights the top-down approach to the improvement of water quality in the Thames, although the impacts of this approach have yet to be fully realised.

Funding Sources

The Environment Agency receives funding federally from the budget of the Department for Environment, Food and Rural Affairs. Thames Water does not appear to have a specific drainage or rainwater charge. The cost of these services appears to be included wastewater services component of the water bill.[24] The average annual combined household bill was £398 in 2019/20 per year.[25]

[24] https://www.thameswater.co.uk/media-library/home/about-us/performance/customer-commitment/codes-of-practice/our-charges-your-bills-code-of-practice.pdf

[25] https://www.thameswater.co.uk/media-library/home/about-us/investors/our-finances-explained-nov-19.pdf

The Impact on the Thames

Some researchers suggest that the Thames is now considered one of the cleanest urban rivers in the world (Edmonds-Brown, 2022), transforming from its state in the 1950s where measured dissolved oxygen (DO) levels in the Thames were at just 5 per cent saturation (or 0.5 mg/l). In that state, the river could only support limited aquatic invertebrate species, such as midges and fly larvae.

Since then, through policy and the adoption of technology solutions such as oxygenators, the DO levels in the Thames have risen above 5 mg/l. This has gradually since the return of species to the river, such as: [26]

- The return of the flounder in 1967
- Followed by 19 freshwater fish and 92 marine species such as bass and eel into the estuary and lower Thames
- Salmon returning in the 1980s
- Today around 125 species of fish are regularly recorded, including seahorses.

Monitoring

The Centre for Ecology and Hydrology (CEH) is tasked with monitoring water quality in the Thames. This is through research programmes that routinely monitor water quality at weekly intervals, and provides an estimate of pollution levels and flow processes of stormwater run-off. The CEH gathers and measures, among other pollutants:

- Phosphorus
- Nitrogen
- Dissolved organic carbon
- Silicon
- Boron
- pH

The CEH also conducts biological monitoring to determine the health of the river and the level of water quality.[27]

While the Thames has seen a marked improvement in water quality, surveys frequently show a dangerous presence of coliform bacteria, and occasionally identify extremely low levels of dissolved oxygen that threaten aquatic life. Storm-water sewage pollution entering the Thames is one of the main expected contributors to these issues.

Further, of 41 Thames River waterbodies monitored for the River Basin Management Plan in 2015, three were classified as bad, five as poor and 33 as moderate. With no waterbodies being described good or very good it signifies the significant work that still needs to be completed in managing the water quality of the Thames (Mayor of London, 2016).

3.7 Summary of review

The case studies reviewed present a wide diversity of approaches to managing water quality in urban estuarine environments. To provide some structure to the study, and to assist with the development and assessment of potential options for the GSH, the study team found it useful to summarise the types of case studies along two main dimensions:

[26] https://theconversation.com/from-biologically-dead-to-chart-toppingly-clean-how-the-thames-made-an-extraordinary-recovery-over-60-years-180895

[27] https://www.ceh.ac.uk/our-science/projects/river-thames-initiative

- **Top-down vs bottom-up:** Whether the delivery of actions is coordinated primarily by directives from government or regulatory institutions, or whether it involves a more interactive bottom-up approach
- **Organic vs statutory backing:** Whether the governance and funding structures have developed without the need for legislative and/or regulatory backing, or is largely due to such backing.

Figure 6 presents the various case studies review along these dimensions.

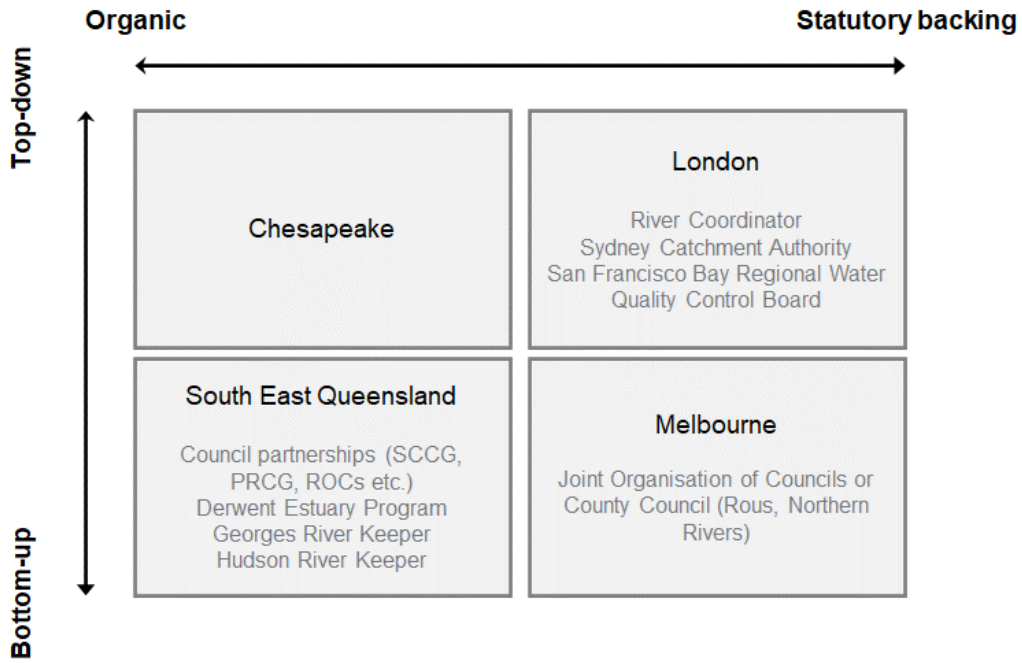


Figure 6 Summary of case studies

Some of the observed key success factors of these case studies were that:

- Where the waterways were of recognised national importance, there were key roles played by national bodies. This includes the role of the:
  - United States Government and the US EPA in the case of Chesapeake
  - House of Commons in the UK.
- The mostly voluntary nature of the collaboration in the case of SEQ has likely been easier because fewer groups were involved, noting that Council areas in SEQ are much larger compared to GSH.
- In terms of council groups, the county council structures can own and operate infrastructure assets but JOCs or ROCs do not.
- Major capital investment has required funding contributions from the federal and/or state governments, such as the investments require to transform the Thames and invest in WSUD and capacity building in the Yarra River catchments.

4 OPTIONS FOR GSH

The study team initially developed the following ‘straw-person’ options to catalyse ideas for potential GSH governance and funding approaches, which the team presented to stakeholders during an options workshop. These options were not intended to be hard proposals, but rather concept options that could be debated, refined, combined or discarded, as the case may be

The options were developed based on the above review of relevant case studies, and consideration of the GSH context in terms of its economically and socially important local, state and national importance, regarding what is potentially an appropriate and effective framework for the context.

4.1 Potential Options

Option 1: Catchment management authority funded by a legislated financial instrument

The first option is broadly based on frameworks adopted in Victoria for the management of waterways in Melbourne. The noteworthy features of Victorian frameworks include:

- A legislated funding instrument for catchment management (Environmental Contributions) and a regulatory backed instrument (Waterways and Drainage Charge)
- Funding directed to activities related to monitoring and management of waterway and coastal health
- Responsibility for catchment management assigned to authorities.

This options involves legislating a financial instrument for the specific purpose of managing stormwater in the GSH. The legislation would enable water utilities to collect a contribution from benefiting households, which would fund a GSH-wide catchment management authority (CMA).

The role of the CMA would be to monitor and manage waterway and coastal health, and invest in stormwater management in partnership with councils. A variant of this option is where the CMA role is played by Sydney Water.

In many ways, this option is similar to the previous SMCMA, aside from the funding mechanism. The scale, scope and costs of the organisation would need to consider the need for investment in the GSH, which will be further investigated as part of Stage 3 of the CMP.

Option 2: Whole-of-government approach

The second option is broadly based on frameworks adopted for managing the Chesapeake Bay environment in Virginia (East Coast of United States). The catalyst for the framework was a congressionally funded study by the United States (US) Government in the 1970s, which led to the formation of the Chesapeake Bay program.

Establishment of the program has subsequently led to:

- Setting of numerical pollutant goals for the health of the bay
- Signing of the 1987 Chesapeake Bay Agreement by District, State and Federal Governments
- Establishment of multi-lateral agreements, including Memoranda of Understanding (MOUs) to cement the partnerships.

This framework has led to the development of Management Strategies to achieve agreed restoration outcomes by 2025.

Straw-person Option 2 envisions a similar whole-of-government approach and multi-lateral agreements for the GSH, with the active involvement of the Australian Federal Government due to the recognition of GSH as a catchment of national significance. A practical example of this type of framework in a different context is

the 'City Deal', which is multi-lateral agreement between federal, state and local governments to invest in a local area considered to be of strategic importance to all levels of government.[28]

The management actions associated with the agreement would be delivered by an entity that includes representation from each layer, and be funded through contributions from each layer including funding:

- Allocated in the federal budget
- Allocated in the NSW budget
- From each of the GSH councils, recovered through a special rate.

Option 3: Catchment management authority funded by NSW consolidated revenue

This option envisions the NSW Government creating a statutory authority to monitor and manage the health of GSH waterways. The authority's roles and responsibilities would be defined in legislation, and its Board appointments and funding would be provided by the NSW Government.

The authority would adopt the following features from case studies that RPS has reviewed, including:

- The setting of tangible goals for the health of GSH waterways (as per Chesapeake), building on NSW's Water Quality Objectives[29]
- Adopting relevant recommendations from international reviews of water quality issues for nationally significant waterways, such as the *House of Commons inquiry into Water Quality in Rivers in England*, which recommended a step change in:
  - Cross-catchment collaboration
  - The strength of regulatory action
  - Investment in actions designed to improve water quality.

The contrast between this option and the previous two options is that the authority would be fully funded by the NSW Government and not through customer contributions (as per Straw-person Option 1), nor through multiple levels of government (as per Straw-person Option 2).

Option 4: Joint Organisation of Councils

The final option involves establishing a Joint Organisation (JO) of Councils under the *Local Government Act 1993*. Unlike Regional Organisations of Councils (ROCs), a JO is a formal organisation under the Act and many of the provisions of the Act apply. For example, a JO is able to levy fees and expenses, and facilitate policy in accordance with Chapter 9 – Section 252.[30]

The membership would be somewhat similar to councils groups that have already been formed for the management of waterways such as the SCCG and the Parramatta River Councils Group (PRCG). However, due to being backed by the provisions contained in Section 400 of the *Local Government Act* 1993, the JO would benefit from a more secure membership and funding base.

The functions of the JO would relate specifically to waterway health monitoring and management, but otherwise be as per Section 400R of the *Local Government Act 1993*, being:

- To establish strategic regional priorities for the joint organisation area and to establish strategies and plans for delivering those strategic regional priorities

[28] City Deals are partnerships between the three levels of government and the community to deliver productive and liveable cities. Examples include the City Deals of Townsville, Launceston, Western Sydney, Darwin, Hobart, Geelong, Adelaide, Perth and South East Queensland (https://www.infrastructure.gov.au/territories-regions-cities/cities/city-deals)

[29] https://www.environment.nsw.gov.au/ieo/

[30] Table 3.2, *Joint Organisation Implementation Guidance: Working together for regional communities*, NSW Government, 2018

- To provide regional leadership for the joint organisation area and to be an advocate for strategic regional priorities
- To identify and take up opportunities for inter-governmental co-operation on matters relating to the joint organisation area.

The actual actions of the entity would be similar to those undertaken by a River Keeper organisation, such as the Georges Riverkeeper, or in the case of the GSH, 'Coastkeeper' type actions.

It should be noted that another potential legislative pathway to establish a multi-Council organisation for water management is Part 2 of the *Water Management Act 2000*. This would involve the Minster ordering the establishment of a water management committee, which would include councils as well as other government and non-government organisations.[31]

4.2 Development of a Proposed Option

The potential options were further refined and evaluated based on a combination of feedback from stakeholders.

Stakeholder feedback

RPS conducted a workshop with members from the PMC on the potential straw-person options, with an open discussion on the implications, advantages and disadvantages of each option. Appendix B contains the workshop briefing paper. The workshop was held via Microsoft Teams on 20 July 2020.

General feedback

General points from the workshop included that:

- An effective governance framework requires clear accountabilities
- A coordinated effort to catchment management yields economies of scale and scope.

Following the workshop, additional general observations provided by participants included that:

- The funding model should consider the traditional hierarchy of:
  - Impactor/user pays first, although it should be noted that many of the impacts of development are historical, which cannot be recovered through retrospective developer charges
  - Beneficiary pays second, and that the beneficiaries are likely to be broad (e.g. city-wide as well as state-wide)
  - Taxpayer/government pays third.
- The organisation should have a stable, ongoing funding base that is transparently assessed, and it is easier to link this type of funding to organisations with an existing asset base.
- The capabilities and knowledge within the organisation are also a crucial consideration.
- The activities of the organisation should integrate with land-use planning.

Stakeholders also discussed the likely form of the delivery agency created/appointed through any of the models. Potential models included CMAs, which generally have limited direct funding; other government models like the Sydney Harbour foreshore authority, which was funded through landholders; the benefits of collaborative arrangements to establish joint agreements via consensus (e.g. Statement of Joint Intent); and NGOs, which have the advantage of relative independence from government, albeit with a less stable funding base.

In terms of the assessment framework, stakeholders indicated that effectiveness, simplicity, equity and cost of living impacts were important criteria for an evaluation method.

[31] https://legislation.nsw.gov.au/view/html/inforce/current/act-2000-092#ch.2-pt.2

Feedback on Option 1: Legislated financial instrument

Stakeholders considered that the delivery entity funded through the financial instrument should be operated on a cost-recovery basis, and that this funding should cover both capital investments and ongoing monitoring. The Upper Parramatta River Catchment Trust was suggested as a historical example of this option (UPRCT). The UPRCT was funded through a charge on Sydney Water's bills and focussed on capital works to mitigate flooding and capacity building. The organisation was ultimately dissolved, despite being established in statute.

It was noted that the delivery agency funded under this model could be a newly created entity, or an established entity appointed as the delivery agency. Stakeholders discussed the possibility of Sydney Water being appointed as the delivery agency.

Feedback on Option 2: Whole-of-government approach

Stakeholders noted that the Federal Government commissioned an independent statutory review of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in 2019, led by Professor Graeme Samuel AC (the Samuel Review). The review recommended a strengthening of the Act to more effectively protect and conserve nationally important environment and heritage matters (Samuel, 2020, Chapter 1). This provides a potential foundation for the Federal Government to support the protection of the GSH, which would need to be further explored.

Other stakeholder comments noted the apparent lack of federal government responsiveness to recommendations by the Productivity Commission and the National Water Commission to address the current fragmentation of responsibilities around water resource management.

Feedback on Option 3: Formation of a catchment authority

It was noted that there are many precedents for this type of model and the advantage of the model is that it facilitates a 'whole of catchment' perspective. Such models have also been historically effective at bringing together landholders and other stakeholders together to conduct joint planning.[32]

While some stakeholders raised a disadvantage of this model being that many have relied on ad hoc funding sources with the funding base not being sustainable in many cases, this option would involve the formal appointment of an authority by government thus providing a more stable funding base.

Feedback on Option 4: Joint Organisation of Councils

Joint Organisations of Councils were perceived by stakeholders to have greater recognition and support with the state government than less formal council collaborations that do not have this same legislative backing. It was noted that a JOC would need to be declared by the relevant Minister.

Feedback on this option included that the other formal council collaborative model would be a County Council, which is also formed under Part 5 of the NSW Local Government Act. Moreover, there are examples of County Councils established in NSW, who provide bulk water supply, customer water supply, wastewater and flood mitigation services, among other services. The advantage of a County Council over a JO is that the former can own and operate infrastructure assets that span across multiple LGA boundaries. County councils can hold assets, provide various ancillary services, and receive income from customers and ratepayers as with state owned corporations.

Features of a desirable option

To inform the selection of a Proposed Option, RPS drew on policy evaluation frameworks commonly adopted by governments for policy proposals.[33] RPS also considered:

[32] Albeit, this is more relevant to rural / regional areas where there are fewer and larger landowners.

[33] Depending on the type of policies being evaluated, agencies normally consider variations around the three themes of efficiency, equity and effectiveness. Similar frameworks are used internationally. For example, the Coglianese (2012) provides a list of four broad

- The characteristics that lead to effective governance, include whether the parties have the authority and the resources to perform their functions, or if they do not have the resources, they have the means to acquire them
- The importance of governance and sustainable funding as outlined in Section 3.1.

Frontier Economics & Alluvium's (2019) review of funding options on behalf of the state government evaluating funding options based on their:

- Dependability and adequacy
- Efficiency
- Equity
- Simplicity
- Transparency.

Table 5 summarises the considerations used to arrive at a proposed governance and funding options for managing stormwater impacts in the GSH, which was developed based on the desktop review, stakeholder feedback and consideration of the GSH context.

These considerations were used as a 'sense check' of the Proposed Option, to ensure that the option is likely to be effective, easy to implement, socially acceptable, efficient, long lasting and equitable.

Table 5: Governance and funding options evaluation method

Assessment criteria	Description
Effectiveness	The governance and funding framework addresses the problems in the problem definition (incentives, funding limitations, capacity) and is likely to lead to tangible improvements in monitoring, reporting and the implementation of water quality measures.
Ease of implementation	The changes under the proposal are practical to implement and cause minimal disruption to existing and complementary stormwater quality management efforts.
Social acceptance	Impacts to consumers and community members are likely to be understood and accepted.
Efficiency	The framework leads to the implementation of measures that deliver benefits in excess of costs, taking into account triple-bottom line impacts.
Longevity	The funding source are sustainable and the responsibilities imposed by the framework are expected to be enduring.
Equitable funding	The costs impacts of implementing the framework are likely to be perceived as equitable and take into account the preferred hierarchy of funding sources (i.e. impactor pays first, beneficiary pays next, taxpayers pay last).

Summary of Proposed Option and second workshop

Based on the first round of feedback and the considerations of desirable features, RPS then presented a Proposed Option at a second workshop with the PMC on 21 September 2022. Appendix C contains the briefing paper distributed to participants before the workshop.

The Proposed Option was based on **Option 2** (Whole-of-government approach), funded through contributions from the three levels of government by agreement, including aspects of Option 4. This is because:

- Options 1 and 3 was considered likely to be challenging to implement, requiring parliamentary processes, regulatory impact analyses and the like. While these challenges are not insurmountable, RPS considers that these options have a longer time to implementation, higher implementation costs and lower likelihood of being achieved, compared to the others.

criteria commonly used when analysing the choice between different regulatory options as being *Impact/Effectiveness*, *Cost-effectiveness*, *Net Benefits/Efficiency* and *Equity/Distributional Fairness*.

- Option 4, on its own will face similar challenges to the status quo, with councils having to fund the organisation through existing revenue sources.

However, the Proposed Option expanded the definition of Option 2 based on the verbal and written feedback provided by stakeholders. This Proposed Option assumed:

- Active involvement by the NSW Department of Environment (DPE), NSW Environment Protection Authority (NSW EPA) and Transport for NSW (TFNSW)
- Sydney Water being the entity that, together with appropriate project partners, leads the delivery of projects that manage stormwater quality in the GSH, not just in its trunk drainage area but also in other parts of the GSH, examples of which are likely to include:
  - Water quality monitoring, modelling and reporting
  - Water sensitive urban design (WSUD) measures (e.g. gross pollutant traps, wetlands and biofiltration systems)
  - Sediment and erosion controls
  - Habitat restoration
- A requirement for all Councils in the catchment to be actively involved through the creation of a JO or similar. This is to address the current situation where some Councils are not members of either the SCCG or PRCG.
- Representation of First Australians through the formation of an advisory body comprising representatives from traditional owners groups, whose purpose will be to:
  - Facilitate meaningful consultation and acknowledgement of traditional owner values (e.g. river as living entity)
  - Inform social procurement policy
  - Etc.

The option assumed that representation could be achieved through a structure like the Birrarung Council in Melbourne (for the Yarra River).[34]

Further feedback

At this workshop, participants noted that:

- It would be useful to have an example budget for the coordinating activities of the entity being proposed
- Federal Government does not have a direct responsibility to waterways except where assets are covered by federal legislation (e.g. RAMSAR listed sites).
- A potential instrument to affect the partnership approach would be a Statement of Joint Intent
- It should be noted that the NSW Government Marine Estate Management Authority (MEMA) organisation does have a WSUD policy
- Councils are not necessarily compelled to join JO structures and can leave them
- An appropriate funding model for the Proposed Option would require considering establishment and operating costs for the entity, as well as capital and operating costs of the individual waterway health projects facilitated by the entity
- Sydney Water can invest in and own assets, and recover the costs of those assets from customers, if directed to by the Minister irrespective of whether those as assets are currently within their defined catchments.

[34] https://www.water.vic.gov.au/birrarung-council/home

5 RECOMMENDED HYBRID OPTION

5.1 Recommended governance approach

By considering feedback provided by the PCG and PMC throughout the project, and through RPS' independent assessment and consideration of the GSH context, this study recommends a governance approach similar to the partnership approach adopted for the protection of Chesapeake Bay (i.e. a partnership model including all levels of government, Sydney Water and indigenous representation).

However, it should be noted that the recommended option is not the same as the Proposed Option that was taken to the second workshop, which was largely based on Option 2, but a hybrid of all options considered, and incorporating selected features of those options.

The rationale for this hybrid approach is that it aims to utilise the strengths of each option while addressing the limitations.

Building on the strengths of Option 2, the partnership would bring together the three levels of Government, First Australians and Sydney Water, to agree to establish an entity whose role would be to coordinate, identify and oversee the implementation waterway health projects.

The entity would be a coordinating entity that implements the strategy for GSH waterway health outlined in the CMP. It would identify waterway health investments, and identify appropriate delivery partners and asset owners for those investments, but not specifically deliver, own or operate waterway health projects.

By being agnostic to asset ownership, the model also retains flexibility to utilise the wide range of potential funding available, including funding individual projects through:

- Sydney Water customers for investments where Sydney Water is likely to be the natural asset owner
- Rate payers where investments are strongly aligned with Council mandates, and through a relaxation of the cap on the SMSC
- Existing NSW Government programs such as the NSW Coastal and Estuary Grants Program, for projects contained in a certified CMP
- Federal Government funding for projects demonstrated to be of national significance.

The establishment costs and ongoing operating costs would be met through contributions from government through consolidated revenue.

Two benchmarks for the operating budget for the corporate activities of this coordinating entity include:

- The Victorian Government providing CMAs corporate funding of $9 million in 2013-14 to "maintain basic corporate structure and delivery of statutory functions under the *Catchment and Land Protection Act 1994*"[35], equivalent to about $1 million per CMA
- Healthy Land and Water, which had an annual budget of around $10 million for the financial year 2020-21, as per its annual report.[36]

Given the size and complexity of the entity, the budget is likely to be closer to the latter benchmark.

Formalisation of the partnership through agreement and subsequent formation of the entity

The purpose of the partnership, which would be formalised through the signing of a partnership agreement through an instrument like an MOU or Heads of Agreement, would be to investigate and establish the new entity.

Similar to the Chesapeake Bay model, this would require each partner to fulfil specific obligations and be formalised through the signing of a partnership agreement. Table 6 provides a draft set of responsibilities for

[35] https://www.audit.vic.gov.au/report/effectiveness-catchment-management-authorities?section=

[36] https://hlw.org.au/annual-reports/

further consideration. Note these responsibilities are in addition to the existing responsibilities these organisations have with respect to stormwater management and waterway health.

Table 6: Draft partnership roles and responsibilities for consideration

Partner	Responsibility in the partnership
NSW DPE	• Establishment of planning policies and setting long term objectives for the waterway • Allocate staff time for development of strategies and plans • Identify NSW Government funding programs that investments identified by the entity could align with • Advise on monitoring and tracking of improvements against policy/strategy • Provide representation on governance committees
NSW EPA	• Input on policy & strategy that will guide investments in water quality improvement measures • Advise on monitoring and tracking of improvements against policy/strategy • Provide representation on governance committees
TfNSW	• Identify opportunities to mitigate water quality impacts of road/rail run-off • Provide representation on governance committees • Act in the organisation's role as the owner of the bed of the harbour
NSW Treasury	• Assessment of business cases for water quality investments
First Australians advisory body	• Representation of First Australians through the formation of an advisory body comprising representatives from traditional owners groups, whose purpose will be to: – Facilitate meaningful consultation and acknowledgement of traditional owner values (e.g. river as living entity) – Inform social procurement policy • This representation could be achieved through a structure like the Birrarung Council in Melbourne (for the Yarra River).[1]
Sydney Water	• Continue current role as trunk drainage manager in parts of the GSH • Co-lead the development of strategies and plans • Advise on monitoring and tracking of improvements against policy / strategy • Identify investments in water quality initiatives • Provide representation on governance committees
Councils	• Co-lead the development of strategies and plans • Identify investments in water quality initiatives • Provide representation on governance committees
Federal Government	• Review the development of strategies and plans for alignment with national policy • Identify nationally significant issues and investment cases • Provide representation on governance committees

[1]: https://www.water.vic.gov.au/birrarung-council/home

Establishment of an entity

However, unlike Chesapeake Bay, this study recommends the establishment of a new entity to plan and deliver investments in water quality in the GSH. This would be somewhat similar to the role of Healthy Land and Water in SEQ, in that this entity would be responsible for:

- Reporting on the health of the GSH waterways
- Report and track GSH waterway health
- Develop an implementation plan to achieve the strategy of the CMP
- Identify and coordinate projects to support the delivery of the implementation plan
- Identify and support the delivery organisations for investments, which would most likely be Sydney Water and LGAs.

The scope of this study did not include advising on the appropriate legal and corporate structures for such an entity, and these aspects would need to be further investigated.

However, the members of the organisation would include each of the partnership signatories and an effective governance structure is likely to include a rotating Chair, the establishment of appropriate committees and decision making frameworks in line with the organisation's objectives.

The entity would progress the work that has been started by the SCCG and PRCG as part of this CMP process, ultimately planning and delivering investments to improve GSH waterway health.

Council representation through a JO to be investigated

Stakeholders identified that a JO is likely to have some of the same limitations as less formal Council groupings, in terms of councils being able to leave the JO and as such, may not necessarily guarantee the stability of participation nor security of commitments from Local Government. This study recommends a further investigation of whether a JO is necessary or desirable. In many ways, the partnership approach and establishment of a new entity avoids the need for the formation of a JO.

5.2 Recommended funding approach

Entity establishment and planning activities

Based on an investigation of potential funding options and feedback from stakeholders, this study recommends that the proposed entity is established through financial contributions from state and federal government, from consolidated revenue, as well as allocation of staff to participate in governance processes.

This acknowledges that the initial activities of developing a whole-of-catchment implementation plan would ordinarily be within state and federal government responsibilities.

Funding following entity establishment

Following establishment, funding will be required to operate the entity sustainably to undertake the coordination activities required. This study recommends that state government continue to fund the operation of the entity, however the capital and operating costs for initiatives should be assessed on a case by case basis, but also that:

- The cap on the SMSC charge levied by local government should be relaxed to fund projects delivered by councils
- Alternative funding sources, such as the potential for a cruise passenger environment levy, should be explored to fund the coordination activities of the entity, with the benefit of such a funding source being that it does not add to general cost of living pressures.

The review of existing funding mechanisms found that there are currently a wide variety of funding sources and that these are appropriate for different types of investments. These sources include:

- Stormwater Management Service Charge
- Council environment or sustainability levies
- Developer contributions
- Sydney Water Stormwater Service Charge
- Additional funding through Sydney Water customers, subject to IPART regulatory frameworks, such as the WHIP
- State Government funding through the NSW Coastal and Estuary Grants Program or other sources
- Federal Government funding through DITRCA.

However, despite this funding being available, the study has also found that there are likely to be investments that benefit the catchment that, without a whole-of-catchment coordination role, individual entities may not have the incentive to pursue. The strength of the recommended option is that these available funding sources should continue to be accessed to fund these investments where appropriate, and

that the SMSC should be increased. Moreover, the model enables the funding of works or activities that have a more regional, cross-LGA and whole-of-catchment benefit that are beyond the scope of individual councils to undertake.

This approach will address the problems identified in Section 2 by addressing:

- **Incentives:** because the role of the entity would be to address whole-of-catchment issues
- **Funding:** by relaxing the cap on the SMSC, utilising existing funding sources where appropriate and exploring potential additional funding sources
- **Capacity:** by ensuring that the entity contains the required mix of knowledge, skills and experience.

The following subsections discusses the funding sources that are likely to be appropriate for the investments in specific initiatives.

Linking existing monitoring activities

The implementation plan would include linking existing water quality monitoring activities.

State agencies are responsible for monitoring estuarine waterways while councils are primarily responsible for managing freshwater waterways and catchments within their LGAs. These stakeholders could continue to fund their own monitoring, but the new entity would operate a coordination function that would link the monitoring programs and enable consistent reporting.

The entity would also investigate the funding options for this activity. The case study review identified that regional monitoring programs can be funded through the private sector, such as in the case of the Regional Monitoring Program (RMP) in San Francisco. In that case, permitted discharges pay for the program through fees in lieu of individual monitoring requirements (Trowbridge et al, 2016). The success of the RMP has been attributed to its collaborative governance, clear objectives, and long-term institutional and monetary commitments. The feasibility of such as approach, or alternative approaches should be investigated.

Investments in water quality initiatives

Investments in water quality initiatives should be funded by the entity that is best placed to own and operate the initiative, with support from the NSW Government, where the investment aligns with relevant policies or programs, or the Federal Government, where the initiative can be demonstrated to be of national significance.

The newly established entity would have a role in investigating the appropriate asset owner or owners, in the case where a multi-council approach is likely to be appropriate, and the funding available to those asset owners, which could be:

- Sydney Water, funding through regulated revenue
- Council(s), funding through an increased SMSC.

These decisions would need to be guided by the GSH CMP as well as more detailed integrated catchment and waterway management plans.

Where the initiative aligns with specific state government policy or are demonstrated to be of national significance, the funding should be complemented by the NSW Coastal and Estuary Grants Program through a certified CMP, or NSW or Federal Government business case proposals.

Operation of water quality initiatives

The asset owner would then be responsible for the operation of the initiative, through either regulated revenue, in the case of Sydney Water, or the SMSC, in the case of Council(s).

5.3 Summary of governance and funding recommendation

Table 7 summarises the recommended governance and funding approach.

Table 7: Summary of governance and funding recommendation

	Summary of recommendation
Type of model	• Partnership between all levels of government, First Australians and Sydney Water • Establishment of an entity to develop an implementation plan and coordinate investments, and track and report progress
Partners	• NSW DPE • NSW EPA • TfNSW • NSW Treasury • First Australians advisory body • Sydney Water • Councils, through either a formal structure such as a JO or otherwise • Federal Government
Funding for entity establishment	• State and Federal Government funding contributions, from consolidated revenue
Funding for ongoing operation (excluding specific investments)	• State and Federal Government funding contributions • Investigate alternative funding sources, such as the potential for a cruise passenger environment levy
Funding for Water quality monitoring program (including analysis, modelling and decision support)	• Should be investigated as part of business plan/case • Sydney Water regulated revenue likely to be an appropriate funding pathway
Funding for investments in water quality initiatives	• Entity should investigate the appropriate asset owner for each investments – Sydney Water customers for investments where Sydney Water is likely to be the natural asset owner – Rate payers where investments are strongly aligned with Council mandates, and through a relaxation of the cap on the Stormwater Service Charge (SMSC) – Existing NSW Government programs such as the NSW Coastal and Estuary Grants Program, for projects contained in a certified CMP – Federal Government funding for projects demonstrated to be of national significance. • Funding complemented by NSW Government where investments within a certified CMP (i.e. through the NSW Coastal and Estuary Grants Program) or in alignment with state government policy and verified through a NSW Government business case • Funding complemented by Federal Government where demonstrated to be of national significance
Operation of water quality initiatives	• Sydney Water regulated revenue • Local Government through an increased SMSC

6 CONCLUSION

6.1 Key findings and recommendation

Building on the work on the GSH CMP to date, this study has identified existing governance and funding limitations that impact on the management of stormwater quality in the GSH. The governance and funding issues arise due to a lack of direct incentives, funding limitations, and lack of organisational capacity.

To address these issues, this study reviewed relevant national international case studies on waterway management, tested potential options for improved governance and funding to manage stormwater impacts on GSH waterways, and tested and refined those options through research and stakeholder input.

This study concludes that:

1. A partnership including all levels of government, First Australians and Sydney Water is likely to be an effective governance model to plan and deliver investments in GSH waterway health. This partnership approach would benefit from lessons learnt from international case studies like Chesapeake Bay and the successful aspects of local initiatives such as Healthy Land and Water in SEQ. The role of the partnership, which would be formalised through an MOU or similar instrument, would be to establish a coordinating entity that oversees and coordinates investments in GSH waterway health.
2. A new entity should be established including members from that partnership, utilising funding contributions from NSW and Federal governments, as well as investigating alternative funding options such as a cruise passenger levy to fund the ongoing operation of that entity. The potential for council participation through the formation of JO should be investigated, albeit this would not guarantee stability of participation or security of council commitments. Rather, a formalised partnership agreement would provide these features.
3. The first priority of that entity should be the development of a whole-of-catchment implementation plan supported by linking existing water quality monitoring activities.
4. The entity should then identify investments that deliver on the objectives of the plan, and appropriate asset owners for each investment.
5. The funding pathway for investments should depend on that asset owner, i.e. regulated revenue for Sydney Water owned investments and an increased SMSC for council(s) owned assets.
6. The funding should be complemented by NSW Government funding, where initiatives are contained within certified CMPs or have strong business cases aligned with NSW Government policy, or Federal Government funding where they are demonstrated to be of national importance.

REFERENCES

Alluvium & NCE (2019). *Richmond River Governance and Funding Framework*. A report for the NSW Department of Planning, Industry and Environment and supporting local governments.

BMT. (2018). *Greater Sydney Harbour Coastal Management Plan Scoping Study*. Prepared for Local Land Services. Retrieved from: https://www.sydneycoastalcouncils.com.au/wp-content/uploads/2018/10/Greater-Sydney-Harbour-Coastal-Management-Plan-Scoping-Study.pdf

California Water Boards (2019). *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*. Oakland, CA. Retrieved from: https://www.waterboards.ca.gov/sanfranciscobay/basin_planning.html

Civille (2022). *Greater Sydney Harbour Coastal Management Program – Stage 2 Investigation into Stormwater Management – Final Study 1 Report*.

DELWP (2016). *Overview of Waterway Management in Victoria*. Retrieved from: https://www.water.vic.gov.au/__data/assets/pdf_file/0022/52429/FINAL-Fact-Sheet-6_Overview-of-Waterway-Management-in-Victoria_Apr-2016_1-.pdf.pdf

Edmonds-Brown, V. (2022, April 21). *From 'biologically dead' to chart-toppingly clean: how the Thames made an extraordinary recovery over 60 years*. The Conversation. Retrieved from: https://theconversation.com/from-biologically-dead-to-chart-toppingly-clean-how-the-thames-made-an-extraordinary-recovery-over-60-years-180895

Elahi, M. (2014). *Municipal stormwater management in Denmark: A socio-environmental study of municipal water managers' praxis*. Uppsala, Sweden: Swedish University of Agricultural Sciences.

Freewater, P. and Kelly, R. (2015). *Sydney Harbour Water Quality Improvement Plan*. NSW Government through Local Land Services. Retrieved from: https://www.sydneycoastalcouncils.com.au/wp-content/uploads/2020/09/SydneyHarbourCatchmentWaterQualityImprovementPlan.pdf

Frontier Economics & Alluvium (2019). *Review of funding options for the management of diffuse source water pollution in NSW*.

House of Commons (2022). *Water quality in rivers – Fourth Report of Session 2021-22*. London: House of Commons.

Healthy Land & Water (2021). *Annual Financial Report FY2021*. Retrieved from: https://hlw.org.au/annual-reports/

Jensen, M. R., Thomsen, A. T. H., Larsen, T., Egemose, S. and Mikkelsen, P. S. (2020). From EU Directives to Local Stormwater Discharge Permits: A Study of Regulatory Uncertainty and Practice Gaps in Denmark, *Sustainability 2020*, 12, 6317.

Mayor of London (2016). *London Sustainable Drainage Action Plan*. London: Greater London Authority.

McClellan, P. (1998). *Sydney Water Inquiry: Fifth Report Final Report Volume 2*. Sydney: New South Wales. Premier's Department.

Coglianese, C. (2012). *Measuring Regulatory Performance: Evaluating the Impact of Regulation and Regulatory Policy*. Organisation for Economic Cooperation & Development (OECD).

Parliament of Australia (2015). *Senate Inquiry into Stormwater management in Australia*. Canberra: Australian Government. Retrieved from: https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Stormwater

Productivity Commission (2020). *Integrated Urban Water Management — Why a good idea seems hard to implement*, Commission Research Paper. Canberra.

Samuel, G. (2020). *Independent Review of the EPBC Act – Final Report*. Canberra: Commonwealth of Australia. Retrieved from: https://epbcactreview.environment.gov.au/resources/final-report

Severinsen, G. (2020). *Reform of the resource management system: The urban context.* Auckland, New Zealand: Environmental Defence Society Incorporated.

Trowbridge, P. R., Davis, J. A., Mumley, T., Taberski, K., Feger, N., Valiela, L., ... & Kelly, J. (2016). The regional monitoring program for water quality in San Francisco Bay, California, USA: science in support of managing water quality. *Regional Studies in Marine Science*, 4, pp. 21-33.

Van De Meene, S. J., & Brown, R. R. (2009). Delving into the "Institutional Black Box": Revealing the Attributes of Sustainable Urban Water Management Regimes 1. *JAWRA Journal of the American Water Resources Association,* 45(6), 1448-1464.

Van de Meene, S. J. (2010). Development of a guiding framework for sustainable urban water governance (Doctoral dissertation, Monash University).

Wong, T.H.F., Allen, R., Brown, R.R., Deletić, A., Gangadharan, L., Gernjak, W., Jakob, C., Johnstone, P., Reeder, M., Tapper, N., Vietz, G. & Walsh, C.J. (2013). *blueprint2013 – Stormwater Management in a Water Sensitive City*. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities, ISBN 978-1-921912-02-3, July 2013.

Appendix A
Other case studies reviewed

A.1 San Francisco Bay, United States

San Francisco Bay provides some close parallels to Sydney being a highly urbanised and complex estuarine catchment.

The water quality in the Bay is overseen by the California Regional Water Quality Control Board – San Francisco Bay Region, and a key instrument the Board uses is the *Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin* (California Water Boards, 2019).

The Water Board operates a program to regulate certain municipal, industrial, and construction stormwater discharges through a permitting system called National Pollutant Discharge Elimination System (NPDES). The Board also operates the Regional Monitoring Program (RMP), which requires permitted discharges to pay for the program through fees in lieu of individual monitoring requirements (Trowbridge et al, 2016). The success of the RMP has been attributed to its collaborative governance, clear objectives, and long-term institutional and monetary commitments.

The Basin Plan outlines:

- Water Quality Objectives (Chapter 3)
- Implementation Plans (Chapter 4)
- Plans and Policies (Chapter 5)
- Surveillance and Monitoring (Chapter 6).

A.2 The Hudson River Keeper, New York, United States

During the mid-20th century, industrial and other pollution was having a significant impact on the Hudson River in New York, leading local fisherman to establish the *Hudson River Fishermen's Association*. The group utilised the *Rivers and Harbors Act of 1888* and the Refuse Act of 1899 to prosecute polluters to significant success.[37]

The novel aspect of the legislation used by the group was that the statutes provided reporters of the violation of the Acts with a 'bounty' reward, which was used to fund a Riverkeeper boat to patrol the river.

With respect to stormwater, the organisation continues to monitor and prosecute stormwater dischargers whose runoff threatens the water quality of the river, recognising stormwater runoff as one of the greatest sources of water pollution.

A.3 The Derwent Estuary Program, in Tasmania

The Derwent Estuary Program is a joint initiative between local government, the Australian Government and industry (Alluvium & NCE, 2019), which focuses on targeted projects such as:

- Litter management,
- Heavy metal monitoring
- a Beach Watch program
- The development of educational resources.

The issue of heavy metal pollution is a key issue for the Derwent because of its significant aquacultural activities.

The formation of the program was initiated following the provision of a government grant to develop a management plan, which brought together the Federal and local governments to ultimately establish the program.

The program aims to advance the ecological health and economic prosperity of the estuary.

[37] https://www.riverkeeper.org/riverkeeper-mission/our-story/a-brief-history/

A.4 The Georges River Keeper

The Georges River is an urban river in Southern Sydney flowing from Illawarra to the river mouth at Botany Bay.[38] The river is continuing to face pressure due to population density, urbanisation and the associated stormwater pollution impacts.

The Georges River Keeper, formed in 1979 is a collaboration of eight councils including:

- Bayside Council
- Campbelltown Council
- City of Canterbury Bankstown
- Fairfield City Council
- Georges River Council
- Liverpool City Council
- Sutherland Shire Council
- Wollondilly Shire Council.

The organisation also represents government agencies, community groups and regional organisations (Alluvium & NCE, 2019). One of the key benefits of the program is its coordinated approach to waterway management that takes a whole of catchment perspective. One of its limitations is its reliance on grant funding to support its program.

A.5 Rous County Council

Rous County Council is a good example of a multi-council structure that has worked to deliver outcomes than span the boundaries of the councils it represents. Its activities have included weed management, floodplain management and bulk water supply. As a County Council, the organisation is able to own assets and levy rates.

These advantages have led to other studies considering the governance and funding arrangements that underpin a County Council structure as the basis for a framework to deliver improved river health in other parts of NSW, such as a potential governance and funding framework for Richmond River waterway health, which has high biodiversity, agricultural and community value (Alluvium & NCE, 2019).

A.6 Northern Rivers Joint Organisation of Councils

The Northern Rivers Joint Organisation of Councils (NRJO) is comprised of the six LGAs of Ballina, Byron, Lismore, Richmond Valley, Kyogle and Tweed in the Northern Rivers region of Northern NSW.

The NRJO delivers projects towards the following priority areas:

- Biodiverse natural environments
- Improved community wellbeing
- A connected region
- Sustainable energy, water and waste
- A diverse regional economy.

The first of those (i.e. Biodiverse natural environments) acknowledges the importance of waterway health to deliver environmental, economic and recreational benefits to its communities. In line with this priority, the NRJO supported the establishment of landmark agreement by its member councils to adopt a holistic and

[38] https://georgesriver.org.au/learn-about-the-river

best practice approach to waterway management called the Northern Rivers Watershed Initiative (NRWI).[39] The initiative targets improvements in stream bank condition and river health that contribute to reduced flood risk within the catchments

A.7 Management of river basins in Denmark

The regulation of stormwater discharges in Europe is managed by the Water Framework Directive (WFD) and the Floods Directive, which establish top-down directives and encourage *"cooperation and joint objective-setting across Member State borders"*. However, individual member states implement the WFD through a combination of legislation and non-legislative guidelines (Jensen et al, 2020).

In Denmark, the achievement of the WFD is supported by the conditional granting of discharge permits, which may be refused to applicants if the discharge is expected to be detrimental to the receiving water and in conflict with Environmental Quality Standards.

Despite this, some researchers have found that this combination of a top-down and bottom-up regime has not proved successful in the member state, due to limitations in data and a lack of clear guidelines from authorities on the pollutant profile of stormwater (Elahi, 2014).

[39] https://www.northernriversjo.nsw.gov.au/Documents/Projects/advocacy-brief-northern-rivers-watershed-initiative.pdf

Appendix B
Options workshop briefing

Reference:	2739
Meeting Name:	Options Workshop - Stakeholder Brief
Meeting date:	20 July 2022
Meeting location:	Microsoft Teams Virtual Meeting

Invitees

Name	Initials	Organisation	Role
Bruce Thom	BT	SCCG	Steering Committee Chair
Sarah Joyce	SJ	SCCG	Executive Officer
Ana Terrazas	AT	SCCG	Water Quality Project Coordinator
Cynthia Chan	CC	SCCG	Program Support Officer
Kapil Kulkarni	KK	RPS Group	Governance and Funding Study Lead
Nell Graham	NG	PRCG	PRCG Coordinator
Maria Plytarias	MP	DPIE-Planning	PMC Member
Daylan Cameron	DC	DPIE-EES	PMC Member
Peter Freewater	PF	DPIE-EES	PMC Member
Hendrik Clasie	HC	TfNSW	PMC Member
Nathan Hale	NH	EPA	PMC Member
Nerida Taylor	NT	Sydney Water	PMC Member
Lyndall Pickering	LP	Sydney Water	PMC Member
John Hudson	JH	Coastal Council	PMC Member
Sharmina Lakshmanaa	SL	Sydney Water	PMC Member
William Glamore	WG	UNSW	PMC Member

Ref no.	Item	Presenter	Time
6.	Introduction and preamble	BT	5 minutes
7.	Workshop objectives and process	KK	5 minutes
8.	Presentation of strawman options	KK	10 minutes
9.	Facilitated discussion	All	30 minutes
10.	Summary and next steps	KK	5 minutes
11.	Closing statements	BT	5 minutes

Purpose

An RPS team, commissioned by the Sydney Coastal Councils Group (SCCG), is investigating governance and funding options to manage stormwater in the Greater Sydney Harbour (GSH) catchment. So far, the team has (1) defined the problem, (2) researched case studies of governance and funding frameworks from other catchments, and (3) put together some high level options for discussion.

The purpose of this workshop is to seek the views of the Greater Sydney Harbour Coastal Management Program's Project Management Committee (PMC) including to 'sense-check' the merits and likely feasibility of the options.

During the workshop, RPS will obtain feedback and insights from the PMC to go back and:

- Refine these initial high level options into better defined options to further investigate / test
- Receive feedback on governance and funding from Councils via Study 2 and assess these updated options using a defined assessment framework
- Identify a shortlist for final stakeholder feedback
- Plan and facilitate a final workshop with the PMC to identify a preferred option.

Conduct of the workshop

RPS will conduct the workshop through Microsoft Teams. The main component of the workshop will be a facilitated debate / discussion / deliberation of the potential high level options, described as the 'Strawman options' on the next page.

Aims and outputs from the workshop

By the end of the workshop, RPS aims to have:

- Refined the definition of the options
- Elicited participants' views on the potential merits and drawbacks of the options
- Ruled out options that are unanimously agreed to be unfeasible.

Following the workshop, RPS will undertake a detailed assessment of the remaining options selected for further analysis, and ultimately recommend a framework for the GSH. This will include a follow-up workshop with the PMC.

Strawman options

RPS will present the following 'straw man' options to spark the thought process during the workshop. These options are not intended to be hard proposals, but rather concept options that can be debated, refined, combined or discarded, as the case may be.

That said, the options were developed based on a review of relevant case studies, and consideration of the GSH context regarding what is potentially an appropriate and effective framework for the context.

Strawman Option 1: Legislated financial instrument

The first strawman option is broadly based on frameworks adopted in Victoria for the management of waterways in Melbourne. The noteworthy features of Victorian frameworks include:

- A legislated funding instrument for catchment management (Environmental Contributions)
- Funding directed to activities related to monitoring and management of waterway and coastal health
- Responsibility for catchment management assigned to authorities.

This options involves legislating a financial instrument for the specific purpose of managing stormwater in the GSH. The legislation would enable water utilities to collect a contribution from benefiting households, which would fund a GSH-wide catchment management authority (CMA).

The role of the CMA would be to monitor and manage waterway and coastal health, and invest in stormwater management in partnership with councils. A variant of this option is where the CMA role is played by Sydney Water.

Strawman Option 2: Whole-of-government approach

The second strawman option is broadly based on frameworks adopted for managing the Chesapeake Bay environment in Virginia (East Coast of United States). The catalyst for the framework was a congressionally funded study by the United States (US) Government in the 1970s, which led to the formation of the Chesapeake Bay program.

Establishment of the program has subsequently led to:

- Setting of numerical pollutant goals for the health of the bay
- Signing of the 1987 Chesapeake Bay Agreement by District, State and Federal Governments
- Establishment of multi-lateral agreements, including Memoranda of Understanding (MOUs) to cement the partnerships.

This framework has led to the development of Management Strategies to achieve agreed restoration outcomes by 2025.

Strawman Option 2 envisions a similar whole-of-government framework for the GSH, led by the Australian Federal Government due to the recognition of GSH as a catchment of national significance. A practice example of this type of framework is the 'City Deal', which is multi-lateral agreement between federal, state and local governments to invest in a local area considered to be of strategic importance to all levels of government.

The management actions associated with the agreement would be delivered by an entity that includes representation from each layer, and be funded through contributions from each layer including funding:

- Allocated in the federal budget
- Allocated in the NSW budget
- From each of the GSH councils, recovered through a special rate.

Strawman Option 3: Formation of a catchment authority

This option envisions the NSW Government creating a statutory authority to monitor and manage the health of GSH waterways. The authority's roles and responsibilities would be defined in legislation, and its Board appointments and funding would be provided by the NSW Government.

The authority would adopt the following features from case studies that RPS has reviewed, including:

- The setting of tangible goals for the health of GSH waterways (as per Chesapeake), building on NSW's Water Quality Objectives[40]
- Adopting relevant recommendations from international reviews of water quality issues for nationally significant waterways, such as the *House of Commons inquiry into Water Quality in Rivers in England*, which recommended a step change in:
  - Cross-catchment collaboration
  - The strength of regulatory action
  - Investment in actions designed to improve water quality.

The contrast between this option and the previous two options is that the authority would be fully funded by the NSW Government and not through customer contributions (as per Strawman Option 1), nor through multiple levels of government (as per Strawman Option 2).

Strawman Option 4: Joint Organisation of Councils

The final strawman option involves establishing a Joint Organisation (JO) of Councils under the *Local Government Act 1993*.

The membership would be somewhat similar to councils groups that have already been formed for the management of waterways such as the SCCG and the Parramatta River Councils Group (PRCG). However, due to being backed by the provisions contained in Section 400 of the *Local Government Act* 1993, the JO would benefit from a more secure membership and funding base.

The functions of the JO would relate specifically to waterway health monitoring and management, but otherwise be as per Section 400R of the *Local Government Act 1993*, being:

- To establish strategic regional priorities for the joint organisation area and to establish strategies and plans for delivering those strategic regional priorities
- To provide regional leadership for the joint organisation area and to be an advocate for strategic regional priorities
- To identify and take up opportunities for inter-governmental co-operation on matters relating to the joint organisation area.

The actual actions of the entity would be similar to those undertaken by a River Keeper organisation, such as the Georges Riverkeeper, or in the case of the GSH, 'Coastkeeper' type actions.

[40] https://www.environment.nsw.gov.au/ieo/

Appendix C
Workshop 2 briefing paper

Reference:	2739
Meeting Name:	Evaluation Workshop - Stakeholder Brief
Meeting date:	21 September 2022
Meeting location:	Level 13, 420 George St, Sydney, NSW 2000 + Microsoft Teams

Ref no.	Item	Presenter	Time
12.	Introduction to workshop	BT	5 minutes
13.	Agreement on case for change	KK	5 minutes
14.	Detail Proposed Option	KK	5 minutes
15.	Facilitated discussion	All	15 minutes
16.	Outline variants	KK	5 minutes
17.	Discussion on variants	KK	15 minutes
18.	Closing statements	BT	5 minutes

Context and purpose

An RPS team, commissioned by the Sydney Coastal Councils Group (SCCG), is investigating governance and funding options to manage stormwater in the Greater Sydney Harbour (GSH) catchment. So far, the team has (1) defined the problem, (2) researched case studies of governance and funding frameworks from other catchments, and (3) investigated high level governance and funding options for the GSH.

The high level options were presented at, and discussed during, a workshop with members of the Project Management Committee (PMC) on 20 July 2022. Following feedback from that options workshop and further analysis, RPS has identified a proposed governance and funding approach (**Proposed Option**). This brief aims to set the scene for the next workshop with the PMC (the evaluation workshop), where RPS will:

- Outline the proposed funding and governance approach
- Discuss a few variants of this approach
- Seek feedback from the PMC on the feasibility, merits and drawbacks for the purpose of incorporating that into the study's recommendations.

Proposed Option (Second workshop)

At the last workshop, RPS presented and discussed the following potential options:

- **Option 1:** Legislated financial instrument
- **Option 2:** Whole-of-government approach
- **Option 3:** Formation of a catchment authority
- **Option 4:** Joint Organisation of Councils

Stakeholders provided feedback on each option at the workshop, as well as written feedback afterwards. Based on this feedback and further analysis, RPS proposes to take forward an option based primarily on **Option 2** (Whole-of-government approach), including aspects of Option 4. This is because:

- Options 1 and 3 are likely to be challenging to implement, requiring parliamentary processes, regulatory impact analyses and the like. While these challenges are not insurmountable, RPS considers that these options have a longer time to implementation, higher implementation costs and lower likelihood of being achieved, compared to the others.
- Option 4, on its own will face similar challenges to the status quo, with councils having to fund the organisation through existing revenue sources.

However, RPS has expanded the definition of Option 2 based on the verbal and written feedback provided by stakeholders. This Proposed Option includes:

- Active involvement by the NSW Department of Environment (DPE), NSW Environment Protection Authority (NSW EPA) and Transport for NSW (TFNSW)
- Sydney Water being the entity that, together with appropriate project partners, leads the delivery of projects that manage stormwater quality in the GSH, examples of which are likely to include:
  - Water quality monitoring, modelling and reporting
  - Water sensitive urban design (WSUD) measures (e.g. gross pollutant traps, wetlands and biofiltration systems)
  - Sediment and erosion controls
  - Habitat restoration
- A requirement for all Councils in the catchment to be actively involved through the creation of a JO or similar. This is to address the current situation where some Councils are not members of either the SCCG or PRCG.
- Representation of First Australians through the formation of an advisory body comprising representatives from traditional owners groups, whose purpose will be to:

  - Facilitate meaningful consultation and acknowledgement of traditional owner values (e.g. river as living entity)
  - Inform social procurement policy
  - Etc.
- This representation could be achieved through a structure like the Birrarung Council in Melbourne (for the Yarra River).[41]

Specific feedback being requested from the PMC

At the workshop, we would discuss the following issues, with the feedback from the workshop contributing to the final recommended option to be documented in the Study 3 report:

- Do you agree that a new governance entity is required to meet the vision for the Greater Sydney Harbour CMP which is to improve and maintain waterway health through greater coordination, consistency and leadership?
- Do you agree that Option 2 (or a variant of) is the preferred option?
- Considering Option 2 and the issues that the SCCG and PRCG face with not all Councils in the catchment being members of either organisation, would it make sense for council involvement to occur through a Joint Organisation (JO) or County Council structure? What would be the advantages, disadvantages and other considerations?
- If Sydney Water took on a greater role, similar to its role for PRCG, how would it be remunerated? Options may include:
  - Rolling assets into the regulatory asset base and recovery of costs through the IPART determination process
  - By government directly at arms-length commercial terms?
- Given the current issues with the Stormwater Management Services Charge identified as part of Study 1 and the need for a sustainable funding source for councils, what alternative funding sources should be explored to set up and operate the new entity? Options may include raising an environmental levy such as that applied to cruise ship passengers in NZ and tourists in Venice?

Conduct of the workshop

The workshop will be held at RPS Sydney offices, located at:

- Level 13, 420 George St, Sydney NSW 2000

Our offices are close to Wynyard and Town Hall train stations and near many CBD bus stops.

Participants are encouraged to join in-person but a Microsoft Teams option will also be available.

The broad structure of the approximately 1-hour workshop will be:

1. Re-confirm the case for change
2. Discuss details of Proposed Option
3. Discuss trade-offs between the potential variants
4. Close.

Aims and outputs from the workshop

By the end of the workshop, RPS aims to have:

- Agreement on the Proposed Option to take forward

[41] https://www.water.vic.gov.au/birrarung-council/home

- Feedback on that option and the potential variants.