

3 June 2024

Honourable Penny Sharpe.
Minister for Climate Change, Energy, the
Environment, and Heritage.
NSW Government.
6 Macquarie Street
Sydney, 2000.

Honourable Daniel Mookhey
Treasurer
NSW Government.
6 Macquarie Street
Sydney, 2000.

Re: Cooks River Valley Association's New Policy Proposal for the Cooks River

Dear Penny and Daniel,

In March 2024 the Cooks River Valley Association wrote to the Cooks River Alliance requesting support for their New Policy Proposal (Attachment 1) by writing to the Minister for the Environment and the NSW Treasurer. This letter is made in response to their request.

The Cooks River Alliance recognises the merits of the Cooks River Valley Association's New Policy Proposal and gives in-principle support to its intent. The following outlines Cooks River Alliance's perspective on the "three long-standing issues affecting the Cooks River catchment" that the New Policy Proposal addresses¹ :

(1) Steel Sheet Piling

The steel sheet piling occurs along stretches of the tidal influenced lower reaches of the Cooks River. It was installed between 1950 and 1970 by the NSW State Government consistent with the NSW *Cooks River Improvements Act* (1946). Since its installation, the sheet piling has become increasingly dilapidated, primarily due to severe corrosion caused by the inappropriate use of steel in brackish and salt waters². It is also considered to be unsightly by the community and provides little opportunities for aquatic habitats to develop, degrading liveability and the environmental value of the river.

Critically, due to the dilapidation, sections of the sheet piling have been identified as high risk to public safety by an independent investigation undertaken by Alluvium Pty Ltd and reported in their memo report "Cooks River Waterway Condition Assessment – Foreshore Public Safety Assessment" (Attachment 2). These high-risk sections are mapped as per Figure 6 (page 9) of this

¹ As specified on page 1 of the Cooks River Valley Association's New Policy Proposal, provided as Attachment 1 with this letter.

² U.S Army Corps of Engineers. (1994). "Design of Sheet Pile Walls". Engineering and Design. Department of the Army, Washington D.C.

memo report, and are identified as requiring urgent management actions to protect public safety. Examples of the degree of dilapidation along high risk stretches of sheet piling are provided as per photographs shown as Figure 5 (page 8) of the memo report.

However, addressing the ongoing degradation and decay of this asset has proved challenging. Key reasons for this are:

- The asset has no official owner (referred to as an “orphan asset”), hence responsibility remains contentious, stifling action.
- The upfront cost of removing the sheet piling and replacing it with a more cost-effective, ecologically beneficial, and community acceptable option is high.
- Due to the placement of underground services (e.g., a high-pressure oil pipeline) and close development in some sections, addressing sections of the sheet piling will require great care, and may also require land acquisition and relocation of services.

Irrespective of these challenges, due to the rapid rate of decay of the existing sheet piling, the Cooks River Alliance recognises that sustainable solutions to these challenges must be found, particularly given the growing risk the sheet piling presents to public safety. Accordingly, the Cooks River Alliance gives in-principle support to the intent of the New Policy Proposal regarding this issue.

(2) Concrete Channelling

During the mid-20th Century, applying concrete channelling to rivers and waterways gained popularity. The intent of such extreme river engineering was to stabilise banks, prevent stream migration, and improve the removal of stormwater during storms (reducing flooding). While these interventions did provide some short-term benefits, they have also created a number of unintended consequences that have become more acute with the passage of time. The concrete channelisation of the upper reaches of the Cooks River and its tributaries is no exception.

Unintended consequences include:

- The destruction of habitat and subsequent loss of aquatic and terrestrial species that lived in and around channelised waterways.
- The loss of natural water quality improvement processes due to the removal of aquatic and riparian vegetation, and reduced infiltration to groundwater (i.e., increased pollution into Botany Bay).
- Significant opportunity costs in the form of lost opportunities for recreational blue-green space / corridors, impacting on local climate change resilience, and the health and wellbeing of residents in affected suburbs^{3,4,5}

³ NSW Government (2023). “Average tree canopy cover, heat vulnerability index and urban heat island of suburbs in Greater Sydney.

⁴ Population and Wellbeing Laboratory (PowerLab): <https://www.powerlab.site/research/publications>

⁵ NSW Ministry of Health (2020). “Healthy Built Environment Checklist – A guide for considering health in development policies, plans and proposals” NSW Government, St Leonards.

- Increased water flow energy that could result in more destructive flooding downstream, a risk that is expected to increase as the intensity of storms increases due to climate change⁶, as well as increased erosion of creek banks.
- High maintenance costs due to the constant need to repair and replace damaged and aging concrete.

As a consequence, many rivers and waterways subject to extensive concrete channelisation in the mid-20th Century are at various stages of being naturalised⁷. Through its river bank naturalisation projects⁸, Sydney Water has and continues to replace aging concrete channelised banks with more 'naturalised' bank stabilisation solutions along sections of the Cooks River and its tributaries. Moreover, by working in conjunction with local councils, Sydney Water is able to see once under-utilised green-blue space gain new life along the banks of the river and its tributaries.

However, the rate at which Sydney Water is able to complete naturalisation is restricted by Sydney Water's capital works funds. Hence, naturalisation works tend to occur only where sections of concrete channelling have reached the end of their asset lifecycle and where site conditions are conducive to naturalisation works (i.e., not restricted by the close proximity of underground or aboveground services, infrastructure, or buildings). Consequently, some sections may not be addressed for another 60 or more years, whereas others may never see naturalisation unless banks can be reclaimed through land acquisitions, or alternative techniques identified. As such, residents in these areas may never see the benefits of bank naturalisation, disproportionately affecting those residents who live in some of Sydney's most disadvantaged suburbs in terms of access to blue-green space and climate resilience⁹.

Accordingly, due to the unintended consequences of concrete channelisation, and the benefits of naturalising affected waterways, the Cooks River Alliance gives in-principle support to the intent of the New Policy Proposal regarding this issue.

(3) Stormwater mitigation: Legislation to ensure Water Sensitive Urban Design measures on private property filter stormwater before it enters the Stormwater System.

Stormwater ingress into the Cooks River and its tributaries is the main source of pollution entering the river (as is the case for most urban waterways), bringing with it a wide range of pollutants, sediments, and sewerage overflows. Due to the advances in urban stormwater management such as Water Sensitive Urban Design (WSUD) in the last 30 years, we now have the knowledge to significantly reduce stormwater impacts. These advances also bring additional benefits (levels of

⁶ CSIRO and The Bureau of Meteorology 2022. "State of the Climate 2022". Commonwealth of Australia, Canberra.

⁷ For example, [Los Angeles is transforming its concrete river](#).

⁸ See "Our Stormwater Systems", Sydney Water website, <https://www.sydneywater.com.au/water-the-environment/what-we-are-doing/current-projects/managing-stormwater.html>

⁹ NSW Government (2023). "Average tree canopy cover, heat vulnerability index and urban heat island of suburbs in Greater Sydney."

services) relative to conventional practices, including enhanced human health outcomes via the establishment of blue-green infrastructure, greater biodiversity through the provision of habitat within urban areas, and improved climate change resilience by reducing the urban heat island effect and improving the retention of stormwater within the catchment (i.e., reduced flood risk).

The Cooks River Alliance gives in-principle support to issue (3), recognising that NSW currently lacks clear policy settings concerning the management of urban rivers and the implementation of best practice stormwater management. In contrast to NSW, Victoria has its Victorian Planning Provisions (VPP) that contains a number of clauses that govern the sustainable management of stormwater runoff from development. This includes clauses 10, 11, 12, 14, 15 and 19, which pertain to all types of development within the state¹⁰. NSW currently has no such policy and legislative instruments, instead leaving it up to the discretion of individual councils. This has resulted in a highly fragmented approach to managing stormwater quality across NSW. Moreover, due to a lack of funding, regulation and enforcement, it is likely that some systems that have been installed are not being maintained at sufficient standards to ensure proper operation or attainment of asset life expectancy¹¹. Hence, benefits for urban rivers like the Cooks River and their communities are not being fully realised.

Cooks River Alliance Position and Recommendations

The Cooks River Alliance recognises that the New Policy Proposal has merit and gives in principle support to its content. Accordingly, the Cooks River Alliance will take the following actions:

- Incorporate relevant aspects into the Cooks River Catchment Coastal Management Program (CMP).
- Incorporate the New Policy Proposal into the Cooks River Master Plan (within the jurisdictional limitations of the Alliance's Member Organisations).
- Work with the Cooks River Valley Association and the broader community to address the issues identified within the New Policy Proposal.
- Work with State and Federal governments to address the issues identified within the New Policy Proposal.

The Cooks River Alliance recommends that the Minister and the Treasurer support the New Policy Proposal by ensuring it is incorporated into future planning instruments and funding mechanisms. This should include incorporation of relevant aspects into the Cooks River Catchment CMP and the Cooks River Master Plan.

Due to the public safety concerns associated with the sheet piling, the Cooks River Alliance also asks the Minister and the Treasurer to ensure that Stage 3 of the CMP clearly identifies an owner

¹⁰ State Government of Victoria and Melbourne Water. (2013). "Water Sensitive Urban Design Guidelines South Easter Councils". Melbourne Water, Docklands, Victoria. Section 1.6.2, pg. 6

¹¹ Thomas et al. (2022). "Blue-green stormwater management in NSW: Examination of challenges and pathways forward". White Paper Version 1. Stormwater NSW, Burwood, NSW.

for the Cooks River sheet piling. This is considered a crucial first step in addressing the current stalemate concerning responsibility for this asset. The Alliance fears that until an owner is officially attributed to this 'orphan asset', sufficient progress will not be made to resolving the growing risk the Cooks River's sheet piling presents to public safety. If ownership is not resolved by the CMP process, we fear that the constant contention around responsibility for this asset over the past few decades will continue without resolution for many years to come.

Yours sincerely,



Clr Clare Raffan
Chair
Cooks River Alliance.



Dr Andrew Thomas
Executive Officer
Cooks River Alliance.

CC: Cooks River Valley Association.

Attachment 1: New Policy Proposal – Cooks River Valley Association (*note: when sent to the Minister and Treasure, the previous version (Version 3) was attached*).

Attachment 2: Cooks River Waterway Condition Assessment – Foreshore Public Safety Assessment.

Attachment 1 – New Policy Proposal, Cooks River Valley Association

New Policy Proposal - Cooks River – Steel Sheet Piling, Concrete Channelling, and Stormwater Mitigation

Lead Agency Name	Department of Planning and Environment
Division	Environment and Heritage
Minister	The Hon Penny Sharpe MLC, Minister for the Environment
Proposal Title	Cooks River – Steel Sheet Piling, Concrete Channelling, and Stormwater Mitigation
Description	<p>The proposal directly addresses three longstanding issues affecting the Cooks River catchment:</p> <ol style="list-style-type: none"> 1) Steel sheet piling: replacing approx. 4.6 km of ageing and unsafe steel sheet piling, owned primarily by the NSW Government, with natural riverbanks. 2) Concrete channelling: bringing forward the replacement of approx. 13.5 km of Cooks River concrete channelling owned by Sydney Water with natural riverbanks, where possible, and increasing canal amenity and passive recreation opportunities elsewhere. 3) Stormwater mitigation: Legislation to ensure Water Sensitive Urban Design (WSUD) measures to see stormwater on public and private property filtered before it enters the stormwater system. Additional on ground measures will create bio retention and filtration assets (ponds and wetlands). <p>Progressing the three elements together allows for an alignment of government, local council, business and community stakeholder interests for the benefit of the whole catchment.</p> <p>The proposal directly delivers on the current Cooks River Masterplan, and Coastal Management Plan processes.</p>

Proposal

In addition to environmental benefits the Cooks River proposal will see significant liveability improvements to Australia's most urbanised waterways helping to improve safety, community mental and physical health outcomes by addressing urban heat, encouraging active transport, providing both active and passive recreation opportunities, and improving the region's climate change resilience.

The environmental benefits include improving the quality of water, open green space, tree canopy and biodiversity in the Cooks River catchment.

Local and international research has demonstrated the cost benefit from urban greenway renewal of 2.88 to 5.81 i.e. for every \$1 invested there is a return of \$3 - \$6 dollars <https://pure.qub.ac.uk/en/publications/social-return-on-investment-analysis-of-an-urban-greenway>

The Cooks River proposal has three main elements:

- 1) Steel sheet piling: replacing approx. 4.6 km of ageing and unsafe steel sheet piling owned primarily by the NSW Government with natural riverbanks. This work will be prioritised based on the 2022 Cooks River Alliance and Crown Lands condition report that identified sections of the piling that presented an immediate risk to public safety.
- 2) Concrete channelling: bringing forward the replacement of approx. 13.5 km of concrete channelling in the main River owned by Sydney Water with natural riverbanks, where possible, and increasing canal amenity and passive recreation opportunities elsewhere. Sydney Water responsibilities are upstream from the Sugar Mill at Canterbury, and the Alexandria Canal <https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/stormwater-network/stormwater-catchment-map.html> Sydney Water currently prioritises channel naturalisation work based on the asset's lifespan – which can be decades. Bringing this work forward, in keeping with Sydney Water's own objectives to naturalise waterways, will contribute to water quality and community amenity while increasing the mental and physical health of local residents. Where existing infrastructure constrains naturalisation international examples show how concrete channelling can be modified to provide amenity, recreation and environmental benefits.
- 3) Stormwater mitigation: Legislation to ensure Water Sensitive Urban Design (WSUD) measures to see stormwater on public and private property filtered before it enters the stormwater system. Unlike other jurisdictions (e.g. Victoria) NSW has no legislative instruments that require WSUD stormwater systems. Unfiltered stormwater and sewerage leakage and overflow after rain are the major causes of poor water quality in the Cooks River. Additional on ground measures will create bio retention and filtration assets (ponds and wetlands). The CRVA suggests three possible legislative options to address stormwater

management by government, local councils and private homeowners to ensure stormwater is filtered before entering waterways:

- a. Amend the Environment Planning and Assessment Act 1979 to include WSUD in all planning approvals.
- b. Amend BASIX to both lower the threshold from \$50k and include WSUD so council approval of development applications for new builds and renovations includes WSUD principles.
- c. A Cooks River catchment State Environment Planning Policy (SEPP) overlay that makes WSUD a consideration for all planning decisions within the catchment.

Where there is suitable space available on ground works to create bio retention and filtration systems will work in tandem with changes over time that result from legislation. Cup and Saucer creek at Canterbury is a successful example of a natural storm water filtration system that could be replicated <https://www.crva.org.au/cup-saucer-creek-history/>

Advantages / Benefits

Replacing the steel sheet piling addresses an immediate public safety concern and, in conjunction with other elements of the proposal, provides a permanent solution to inter-related issues affecting the Cooks River.

Implementation of naturalised riverbanks and cleaner water will address key factors promoting human health and social cohesion for the 500,000 people in the Cooks River catchment. Significant benefits include increasing urban amenity, liveability and community wellbeing. The proposal also addresses urban heat effects, increases canopy cover and will assist with mitigating flood risks providing a significant boost to the region's climate change resilience.

Delaying the restoration of the Cooks River will exacerbate its deterioration and result in higher repair costs and risks. In many areas the steel sheet piling currently represents an ongoing risk to public safety. The proposal to naturalise the Cooks River and measures to filter stormwater directly delivers on a range of NSW Government policies. The Cooks River proposal also capitalises on the increasing community support and media attention being paid to the Cooks River.

Financial Impact

Expenditure	24/25	25/26	26/27	27/28	28/29	5 years
Steel sheet piling	\$10m	\$30m	\$30m	\$30m	\$30m	\$130m
Concrete channelling	\$15m	\$90m	\$90m	\$90m	\$90m	\$375m
WSUD – on ground works	\$5m	\$25m	\$25m	\$25m	\$25m	\$105m
Total	\$30m	\$145m	\$145m	\$145m	\$145m	\$610m

Notes:

- All costs are estimates noting that supply chains are still recovering from COVID disruption and labour costs are increasing:
https://www.infrastructureaustralia.gov.au/sites/default/files/2023-04/2022_IA_Market-Capacity-Report_2.0_HR.pdf
- Assume Tier 1 contractors.
- First year 2024/25 scoping, technical reports.
- Steel piling – prioritise work based on 2022 condition report.
- Recent Sydney Water experience at Muddy Creek (Brighton-Le-Sands) and Johnstons Creek (Annandale) indicates bank naturalisation costs up to \$25m per km.
- Unfunded and out of scope - estimated \$2.5b to naturalise remaining approx. 100km of concrete channelling in all Cooks River tributaries.

Other sources of investment

In addition to new funding as part of the 2024 – 2025 budget the NSW Government may be able to identify investments and resources available from the following sources:

- (For the steel sheet piling) NSW Department of Premier and Cabinet guidelines (C2014-04 Cabinet Standing Committee on Expenditure Review- Procedures and Operational Rules) indicate that funding can be sought outside of the annual budget process where the proposal is ‘unavoidable’ and ‘genuinely urgent and cannot be considered in the Budget process; and cannot be accommodated within existing resources.’:
<https://arp.nsw.gov.au/c2014-04-cabinet-standing-committee-expenditure-review-procedures-and-operational-rules-2014/>
- Transport Orientated Development Community Infrastructure commitments.
- Westinvest (Noting that Inner West Council is not one of the 15 eligible councils) <https://www.nsw.gov.au/grants-and-funding/westinvest>

- Sydney Water IPART approved Levy: Waterway Health Improvement Program
<https://www.sydneywater.com.au/water-the-environment/what-we-are-doing/current-projects/managing-stormwater/improving-waterway-health-across-sydney.html>
- Sydney Water has \$1.5B in retained earnings (2022/23) and there will be an IPART pricing review in 2025: <https://www.sydneywater.com.au/about-us/our-publications/annual-report.html>
- NSW Housing and Productivity Contributions local government grant funding: <https://www.planning.nsw.gov.au/sites/default/files/2023-05/housing-and-productivity-contribution.pdf>
- Local Infrastructure Contributions (previously known as S94 or developer contributions) to councils.
- Commonwealth – Urban Rivers and Catchments Program:
<https://www.dcceew.gov.au/environment/biodiversity/conservation/urban-rivers-catchments-program>

Rationale

The CRVA has done a desktop analysis of the various reports and strategies since 1974 to address critical issues with the Cooks River including pollution, water quality, steel sheet piling and the concrete channelling. The document runs to 16 pages: <https://www.crva.org.au/wp-content/uploads/2023/07/2023-Cooks-River-Reports-List-as-at-14-June-2023.pdf>

The previous Coastal and Catchment Management Plans from 1991, 1993, 1999, 2006, and the more recent Greater Sydney Commission district plans, all talk about naturalising the Cooks River.

As an example: the 1999 Catchment Management Plan, developed with Sydney Water, included naturalising all the Cooks River tributaries. Then in 2007 Sydney Water produced a Cooks River Naturalisation Master Plan that identified numerous opportunities to naturalise riverbanks and create wetlands along the Cooks River.

The current Cooks River Coastal Management Plan and Master Planning processes are unfunded for the final implementation stages. Work can progress now using currently available information and the existing experience of the NSW Government and Sydney Water.

The Cooks River Valley is arguably the most poorly regulated river catchment in Australia, and faces significant increases in urban density. Instead of continuing to monitor the River's decline this proposal offers solutions building on recent media and community interest and activity to improve the Cooks River
<https://www.smh.com.au/interactive/2023/cooks-river/>

The Cooks River proposal supports actions at scale with positive impacts on those communities most affected by COVID and neglected by previous NSW governments. The deteriorating steel sheet piling presents an immediate public safety issue this proposal addresses. The Cooks River is also used by thousands of people every day for active and passive recreation. It is these common and highly prized activities that are not well recognised and undervalued when compared to investments made in structured recreational activities like aquatic centres and sports fields. Research carried out across Australia demonstrates the central role of active and passive recreation to the health of individuals and cohesive communities

<https://www.powerlab.site/research/publications>

The ongoing use of the Cooks River as a drain is incompatible with achieving amenity and liveability goals including walking, cycling, exercise, relaxation, nature appreciation, picnics, playgrounds, bird watching, bushcare, fishing, swimming and paddling. Improvements to the Cooks River will have a positive impact on all of these activities while also addressing biodiversity, habitat, water quality and climate change related goals like increasing urban canopy cover and reducing urban heat effects.

Steel piling - safety

It is accepted that the NSW Government, primarily through Crown Lands, owns and is responsible for the steel sheet piling (Sophie Cotsis Legislative Assembly Hansard – 18 September 2019, and Question on Notice 596 the same year). Prior to that, in 2008, the NSW Government replaced a section of steel sheet piling with naturalised banks: https://www.dpi.nsw.gov.au/data/assets/pdf_file/0003/633720/Case-study_Ewen-Park.pdf

Meanwhile the steel sheet piling has continued to deteriorate to the point where it presents a critical safety issue that requires immediate action. The Cooks River Alliance 2022 Cooks River Waterway Asset Condition Assessment – Foreshore Public Safety Assessment report provides current and clear advice on public safety risks and the sections of steel piling to prioritise for replacement.

Photos below of the Cooks River at Earlwood show the jagged rusty steel piling and subsiding riverbanks close to a well-used cycling and pedestrian path. Rather than attempting to place a fence on this unstable bank the demonstrated need is funding for a permanent, safe, and environmentally sound solution that creates community amenity. Naturalising these banks is the best solution for the Cooks River and the community.

Earlwood – unsafe steel sheet piling and bank subsidence



Concrete Channelling – amenity

Sydney Water does undertake bank naturalisation work on small sections of the concrete channelling within the Cooks River catchment. One current example is plans to naturalise river banks at Walsh Avenue with Burwood Council:

<https://www.sydneywatertalk.com.au/walsh-avenue-reserve>

What is missing is a funded plan to replace the majority of the 13.5 km of concrete channelling with naturalised banks. The CRVA does see and acknowledge the good work Sydney Water has done to naturalise sections of the Cooks River where the concrete has deteriorated. The majority of the concrete was installed from the 1930s to as late as the 1960s and is in varying states of repair. A 2018 case study of a previous Sydney Water naturalisation project was replacing deteriorating concrete installed in the 1930s and 1940s which may indicate that remaining concrete will soon be in need of replacement. The most recent 2022/23 Sydney Water Annual Report states that " We [Sydney Water] have developed the following actions we will implement over the next decade to ensure we reduce our impact and deliver on our customers' expectations for healthy waterways and lands....Restore nature and waterways, including via bushland and effective land management, naturalising waterways, restoring waterways and delivering wetlands to retain water in the landscape" (p128). Yet it remains unclear whether Sydney Water has a planned and budgeted forward schedule of works that will naturalise most, if not all, of the Cooks River concrete channelling over the next few years.

There are some sections where site constraints (flood risks, pipelines, housing and other infrastructure) limit the possibility of naturalisation yet for much of the concrete channelling opportunities exist. The Cooks River is highly urbanised for Australia and there are many relevant international case studies, particularly from Asia (Hong Kong, Japan, South Korea), demonstrating what can be done in an urban environment to increase environmental values as well as community amenity and recreation. For example the Cheonggyecheon Stream Restoration Project in Seoul, South Korea, showcases what is possible even in the centre of a major city without being able to achieve a natural bank profile:

<https://www.landscapeperformance.org/case-study-briefs/cheonggyecheon-stream-restoration-project>. The photos below from Seoul give a feel for both the constraints and the resulting achievement that is relevant to the Cooks River.

Additional case studies and research from Hong Kong notes that the main drivers for change, and main benefits to the community, are improved amenity with an associated increase in visitation and recreation opportunities:

<https://www.sciencedirect.com/science/article/abs/pii/S2210670723004961>

These benefits that will take on greater importance along the upper reaches of the Cooks River as urban density inevitably increases.

Cheonggyecheon Stream Restoration Project in Seoul, South Korea



Stormwater Mitigation – water quality

Unfiltered storm water from hardened urban landscapes is the main source of problems detrimentally affecting the Cooks River where water quality can be so poor it exceeds primary and secondary contact guidelines <https://www.crva.org.au/water-quality/>

While there are established swimming spots on the Georges and Parramatta Rivers water quality in the Cooks River is consistently rated unsafe for swimming (primary contact) and large sections are unsafe even for boating (secondary contact). In 2011 UNSW researchers described the Cooks River as an ‘open sewer’ after heavy rainfall and noted high concentrations of pollutants exist even during extended

periods of dry weather 'indicating that the aging sewers are leaking into the river':
<https://www.unsw.edu.au/newsroom/news/2011/10/sydney-river-an--open-sewer->

There do not appear to be any planned Sydney Water 'Urban Plunge' program sites to deliver swimming and recreation opportunities for the Cooks River.

Reducing the volume of water and slowing it down so it can be absorbed before it enters the Cooks River will also assist with flood risk management.

Legislation to embed WSUD in planning approvals, and lowering the financial threshold trigger, will be an effective intervention over time given as public works are undertaken, businesses are maintained and private homes are renovated.

On ground works to create bioretention areas that filter particulates, reduce water velocity and capture pollutants will provide effective short to medium term solutions for the longer-term improvements resulting from legislative changes.

Cost Benefit Analysis

The cost benefit analysis for the Cooks River proposal is expected to be subject to a Treasury Business Case Analysis, and Gateway Review (>\$10m):

https://www.treasury.nsw.gov.au/sites/default/files/2021-12/tpg21-11_parameter-and-technical-adjustments-and-new-policy-proposals-measures.pdf

It is sometimes thought that it can be difficult to identify and measure the effects of a proposed measure or regulation, especially when there are impacts on goods not traded in markets, such as pollution levels and access to scenic views.

Costs and benefits are said to be difficult to value in dollars because their magnitude may be unknown or uncertain, or because they are difficult to express in monetary terms even if their impact is known. Examples include environmental, social and cultural considerations, regional impacts, health and safety

<https://oia.pmc.gov.au/sites/default/files/2021-09/cost-benefit-analysis.pdf>

Fortunately the value of improving urban stream health in the Cooks River has been demonstrated: <https://researchoutput.csu.edu.au/en/publications/river-health-project-report-the-value-of-improving-urban-stream-h>

Similarly international research indicates a cost benefit from urban greenway renewal of 2.88 to 5.81 i.e. for every \$1 invested there was a return of \$3 - \$6 dollars: <https://pure.qub.ac.uk/en/publications/social-return-on-investment-analysis-of-an-urban-greenway>

Within NSW intangible benefits are also regularly utilised to support investment by Sydney Water when naturalising riverbanks.

In addition, the NSW Government has developed the Valuing Green Infrastructure and Public Spaces Framework that provides a standardised, robust and

comprehensive way to identify and quantify costs and benefits associated with green infrastructure and public spaces. The department of planning and environment developed the framework with NSW Treasury, leading economists and policy makers. It provides a way for practitioners to accurately value these important assets and will help deliver lasting change for communities

<https://www.dpie.nsw.gov.au/our-work/programs-and-initiatives/urban-greening/valuing-green-infrastructure-and-public-spaces>

Research by the University of NSW, and the Wollongong based Population Wellbeing and Environment Research Lab, has demonstrated that quality green spaces are effective interventions to reduce loneliness with related cost benefits for government <https://www.unsw.edu.au/newsroom/news/2022/08/1-in-4-australians-is-lonely--quality-green-spaces-in-our-cities>

<https://www.powerlab.site/home>

Internationally there are Environmental Cost Benefit Analysis tools developed by the UN Development Program <https://www.adaptation-undp.org/resources/peer-reviewed-article/environmental-cost-benefit-analysis-giles-atkinson-and-susana> and the OECD <https://www.oecd.org/env/tools-evaluation/CBA-brochure-web.pdf>

Interdependencies and Linkages

As Minister for the Environment, the Hon Penny Sharpe MLC, is best placed to lead the Cooks River proposal for the NSW Government. The Hon Steve Kamper MP, Minister for Lands and Property (Crown Lands), and Member for Rockdale, has primary responsibility for the steel sheet piling. The Hon Rose Jackson MP, as Minister for Water, responsible for Sydney Water, has responsibility for the concrete channelling and a significant stake in the stormwater mitigation sections of the Cooks River proposal.

Success will then depend on effective support and collaboration between the other major government and council stakeholders within the Cooks River catchment including:

- The Hon Jo Haylen MP, as Member for Summer Hill
- The Hon Sophie Cotsis MP, as Member for Canterbury
- Mr Jason Yat-Sen Li MP, Member for Strathfield
- The Hon Jihad Dib MP, Member for Bankstown
- The Hon Ron Hoenig MP, as Member for Heffron
- Cooks River Alliance and member Councils: Bayside, Inner West, Canterbury Bankstown, and Strathfield
- Burwood Council

A crucial interdependency is accurately identifying asset owners of the steel sheet piling. Resolving this ongoing issue, most likely through Crown Lands assisted by local councils, will provide a basis for implementation of the Cooks River proposal. It remains uncertain whether the Cooks River Coastal Management Plan will address this fundamental question regarding ownership of steel sheet piling and securing the funding to replace it.

In addition to the concrete channelling in the main Cooks River, Sydney Water is also responsible for approx. 100km of channelling in the many Cooks River tributaries, streams and drains. This additional channelling is out of scope for the current Cooks River proposal though naturalisation of these assets will require sustained attention and resourcing in the future.

The Cooks River proposal is anticipated to stimulate council and community activity to support improvements to the Cooks River. Councils will be motivated to make improvements to surrounding parklands while community members and organisations will see new members and activity to support bushcare and recreation.

Various recent governments including the ALP have proposed increased density along the Sydenham to Bankstown corridor associated with Metro Southwest:
<https://www.planning.nsw.gov.au/policy-and-legislation/housing/transport-oriented-development-program>

Without adequate investment in stormwater and sewage infrastructure pollution in the Cooks River risks getting worse.

The Cooks River catchment already lacks sufficient green space for its current population. Two potential opportunities to address this include:

- * Cooks Cove: preserving the Rockdale Wetlands Corridor.
- * Canterbury Racecourse: purchase for use as public open space.

Risks

Doing nothing to address the demonstrated steel sheet piling safety risks is not an option given the potential for serious injury or death presented by current and future dilapidated sections. Fencing provides a band-aid short term solution unlikely to be acceptable to the community given the visual impact and absence of any plan to fix the underlying problem. Fencing does not address the worsening condition of the asset which is already showing signs of destabilisation, and in some places collapse. The overarching risk is that the Cooks River continues to be regarded as a drain allowing decay to continue and fostering a perception of neglect for the environment and community within the catchment.

The longer the Cooks River is neglected the more expensive and harder to fix the problems will become. Every day that the steel sheet piling issue is left unaddressed

represents an opportunity cost in lost amenity and environmental improvement not realised for the community and local economy.

Accurate costing is a risk given the variability of on the ground conditions which can include challenges like abutting private homes and sports fields, acid sulphate soil, asbestos, the height of the riverbank, ongoing concerns about flood risk, and hydrological constraints like bridges and narrow riparian zones with limited space to widen channels.

Any Sydney Water IPART approved levy carries potential political risk as a new 'tax' on communities already disproportionately affected by cost-of-living challenges. Careful consultation and communication can assist to mitigate this risk as Sydney Water can demonstrate a track record of community support for a modest levy where it improves waterway health.

Impact on State Outcomes and Premier's Priorities

State outcomes and Priorities for the NSW Labor Government are emerging. There are several existing policies and commitments in place that this proposal aligns with:

- **Cities for nature:** Increasing the abundance and diversity of native plants and animals by creating quality habitat and green links to reduce habitat fragmentation <https://www.environment.nsw.gov.au/get-involved/sydney-nature/cities-for-nature>
- **Get Active:** Active transport (walking and cycling) is the most sustainable form of transport and contributes to improving neighbourhoods and the environment, reducing car use and traffic congestion, supporting local economies, and improving the general health of communities in NSW <https://www.transport.nsw.gov.au/projects/programs/get-nsw-active>
- **Healthy Built Environment:** NSW Health checklist to deliver quality local environments including open space and natural features, social infrastructure, social cohesion and connectivity, environment and health, and environmental sustainability and climate change <https://www.health.nsw.gov.au/urbanhealth/Pages/healthy-built-enviro-check.aspx>
- **Litter Prevention:** The Cooks River Litter Prevention Strategy funded by the NSW Environment Protection Authority aims to reduce litter by 50% <https://rivercanoeclub.org.au/wp-content/uploads/2022/03/Litter-strategy-v06-highres-FINAL.pdf>
- **Liveable Cities:** Sydney Water policy promoting the value of healthy waterways to connect people with the environment and each other <https://www.sydneywater.com.au/education/water-management/liveable-cities.html>

- **Nature positive summit:** In October 2024 Sydney will host the worlds first nature positive summit to consider how to supercharge investment in projects that repair nature <https://minister.dcceew.gov.au/plibersek/media-releases/joint-media-release-sydney-host-worlds-first-global-nature-positive-summit>
- **Public Open Space:** Well-connected open space plays a crucial ecological, economic, social and cultural role in people's lives <https://www.planning.nsw.gov.au/policy-and-legislation/open-space>
- **Resilient Sydney:** A collaboration between metropolitan Sydney Councils and the NSW Government to live with the impacts of climate change by adapting to sustain quality of life and the environment <https://resilientcitiesnetwork.org/sydney/>
- **Swimming:** Sydney Water's 'Urban Plunge' policy recognises that making it possible to swim in rivers has the capacity to transform amenity, recreation, health and enterprise across Greater Sydney <https://urbanplunge.sydneywater.com.au/>
- **Towards net zero:** improving environmental outcomes and strengthen the prosperity and quality of life for the people of NSW <https://www.energy.nsw.gov.au/nsw-plans-and-progress/government-strategies-and-frameworks/reaching-net-zero-emissions>
- **Urban heat:** addressing urban heat island effects through improved waterways and green spaces has a positive impact on human health and wellbeing, economic productivity, the environment, critical infrastructure and services <https://www.planning.nsw.gov.au/policy-and-legislation/resilience-and-natural-hazard-risk/urban-heat>
- **Urban tree canopy:** Urban tree canopy and green cover plays an important role in creating healthy, happy and liveable neighbourhoods. Target 40% canopy cover by 2036 <https://www.dpie.nsw.gov.au/our-work/programs-and-initiatives/urban-greening/greener-neighbourhoods>

CRVA, Author and Version Control

The Cooks River Valley Association (CRVA) is an incorporated association made up of caring local residents who are committed to rehabilitating the Cooks River and fostering community spirit within the Cooks River Valley. We work independently and with like-minded groups to facilitate natural resource management and to improve the quality of life and facilities in the local environment. The most recent CRVA Annual Report for 2022-23 is at: <https://www.crva.org.au/wp-content/uploads/2023/08/2023-CRVA-annual-report.pdf>

Gareth Wreford
CRVA Committee Member
garethwreford@gmail.com
0455096049

Version	Date	Changes	Notes
1	30 November 2023	N/A	Desktop research and Sydney Water engineering information
2	7 December 2023	Feedback from CRVA Committee, River Canoe Club, Brian Keogh	Strengthened stormwater mitigation section. Initial version submitted to NSW Government
3	29 February 2024	Feedback from Cooks River Alliance	Greater focus on climate resilience
4	19 May 2024	Feedback from Labor Environment Action Network (LEAN) and NSW MPs. Address points raised in written responses from Crown Lands and Minister for Water (Sydney Water).	CRVA letterhead. Stronger focus on safety, amenity and lack of action resulting from previous plans.

Attachment 2 – Cooks River Waterway Condition Assessment – Foreshore Public Safety Assessment.

Memo

Subject Cooks River Waterway Asset Condition Assessment – Foreshore Public Safety Assessment
Project 0621090
Distribution Claire Wheeler, Cooks River Alliance
Date 26 August 2022

1 Summary

The Cooks River Alliance (CRA) engaged Alluvium Consulting Pty. Ltd. (Alluvium) to assess the current condition of waterway assets in the Cooks River catchment. The assessment supports the development of the Coastal Management Program (CMP) and identifies key future management needs and options. During the assessment, the CRA and representatives from the NSW Department of Planning and Environment (DPE) who co-fund the CMP, found that a portion of waterway assets that are constructed of steel sheet piles are in very poor condition and present an immediate hazard to public safety. The CRA and DPE concluded that the public hazard of the sheet piles should be addressed as a matter of urgency. In response, the CRA requested a modification to Alluvium’s scope to perform an urgent assessment of the public safety hazard associated with the sheet pile assets. It should be noted that the management options proposed in this memorandum are temporary solutions intended to reduce the current public safety hazard while more permanent and comprehensive management options are developed as part of the CMP.

The purpose of the study was to characterise and map the public safety hazard resulting from the sheet pile waterway assets and propose immediate measures to address this hazard. The study area includes the reaches of the Cooks River with steel sheet pile bank protection, which includes 1.95 km of the left bank and 2.18 km of the right bank of the river. The assets are located in parts of the Inner West and Canterbury Bankstown Council Local Government Areas (LGAs). The method for assessment of the public safety hazard was a site inspection of the full extent of the sheet pile assets, during which data regarding the condition of the assets, plus other factors contributing to the resulting hazard, such as the presence of physical barriers, were recorded. During this process, the sheet pile assets were delineated into ‘reaches’ of similar characteristics. The data were then used in a risk assessment calculation, which classified the public safety hazard as either low, medium or high.

The results were that 1.57 km of the shoreline assets are rated as a low public safety hazard, of which 1.20 km is within Canterbury-Bankstown Council and 0.38 km is within Inner West Council. 1.13 km of the shoreline assets are rated as a medium public safety hazard, of which 0.91 km is Canterbury-Bankstown Council and 0.22 km is within Inner West Council. 1.43 km of the shoreline assets are rated as a high public safety hazard, of which 0.61 km is within Canterbury-Bankstown Council and 0.81 km is within Inner West Council.

The study also included a review of potential management options for mitigation of the public safety hazard. On a balance of cost, sustainable material selection, visual appearance, resistance to flood flows and a low chance of blocking flood debris, the assessment recommends the installation of a timber fence to exclude the public from the sheet pile edges. The estimated cost to install fencing along the high hazard reaches is \$93,000, and to install it along the medium hazard reaches would be another \$73,000. The distribution of these between the Councils is as follows:

- Canterbury-Bankstown Council: High hazard reaches = \$40,000, medium hazard reaches = \$59,000.
- Inner West Council: High hazard reaches = \$53,000, medium hazard reaches = \$14,000.

This memorandum documents the method of assessment, the hazard classification results and presents a series of management options. Also included is a map of the assets, classified by the calculated hazard (Figure 6).

2 Method

The study was conducted through a four-step process as described in the following sections.

2.1 Step 1: Desktop assessment

A preliminary desktop analysis of the study area was performed based on the Cooks River Draft Waterway Asset Database, as provided by the CRA in September 2021. The mapping indicated where the project team should expect to find the sheet pile assets and along with an inspection of aerial imagery gave an initial understanding of the adjacent land use. Maps of the study area were prepared and used to record data during the field assessment.

2.2 Step 2: Field assessment

On the 8th of June 2022, Oliver Light (Alluvium) and Katherin Angelin (Alluvium) conducted a field assessment of the sheet pile shoreline identified in the Draft Waterway Asset Database. The sheet pile was assessed from the top of the bank. It is important to note that the assessment focused solely on the public safety hazard associated with the exposed edge of the sheet pile and land subsidence occurring immediately landward of the sheet pile edges. The scope of the assessment did not include a comprehensive structural assessment of the sheet pile assets.

The shoreline was delineated into reaches during the field assessment. The term 'reach' has been used to describe a length of shoreline asset with similar characteristics. A total of 41 reaches were delineated across both banks of the river.

The extent and condition of each reach were recorded using GPS and georeferenced photos. The following observations were recorded:

- The drop height from the edge of the sheet piles to the bank
- The exposed height of the sheet piles
- The distance from the walkway to the sheet pile assets
- The type and extent of vegetation on the channel banks, i.e seaward of the sheet piling
- The type and extent of vegetation in the riparian zone, i.e. landward of the sheet piling
- The condition of the top of the sheet piles
- The presence and extent of sinkholes near sheet pile assets
- The presence, type, and condition of existing barriers such as fences excluding people from the sheet pile edges.

The exposed sheet pile condition ranged from poor to moderate. The extent of sheet piling didn't exactly match that of the earlier mapping, with several reaches mapped as sheet piling found to be a natural bank, and vice versa. The full extent of the shoreline between the most upstream and downstream mapped sheet pile was assessed.

A range of conditions relating to the likelihood of public safety hazard attributed to the sheet pile was observed. The most critical element in the assessment appeared to be the presence of formal or informal barriers discouraging the public from accessing the sheet pile edges. The results are presented in more detail in the following sections.

2.3 Step 3: Public safety hazard assessment

The next task in the study was to develop and perform an assessment of the public safety hazard associated with the sheet pile edges. A hazard assessment method using a high-level Multi-Criteria Analysis (MCA) was developed to process the data collected during the field assessment. The purpose of the MCA was to categorise the public safety hazard of each reach, which would later be used to recommend where immediate works should be implemented to address the hazard.

Weightings are applied to the score of each criterion, as some criteria are deemed to be a greater contributor to public safety hazard than others. Each criterion was assigned a weighting from 1 to 5 based on the perceived relevance of that criterion to the assessment of public safety. It should be noted that the assignment of weightings also considered the range of scores that were assigned within each criterion, and the impact they have on results. For example, some criteria had scores from zero to two, while others had scores from zero to seven, and the weightings assigned took this into account.

Table 1 presents the categories used in the MCA, along with the weightings applied to each. Where a score fell on the margin between two categories, the more conservative value was selected.

Table 1. MCA categories

Criterion	Description	Category/score	Weighting
Drop height	Height from the top edge of the sheet pile assets to the current toe	(1) 0.5 - 1m (2) 1 - 1.5m (3) 1.5m - 2m (4) >2m	1
Exposed height	Height of the sheet piles that are exposed	(1) <0.05m (2) 0.05-0.1m (3) 0.1-0.2m (4) 0.2-0.3m (5) >0.3m	3
Distance to walkway	Distance from the walkway to the sheet pile assets	(0) No walkway (1) >10m (2) 7-10m (3) 5-7m (4) 3-5m (5) 2-3m (6) 1-2m (7) <1m	3
Riparian vegetation	The type and density of vegetation within riparian zones.	(1) Heavy trees (2) Light trees (3) Grass	3
Instream vegetation	The type and density of vegetation on the banks.	(1) Thick mangroves (2) Sparse mangroves (3) None	2
Pile top conditions	Conditions of the top of the sheet piles. Whether they are corroded, jagged, breaking apart, etc.	(1) Very good (2) Good (3) Moderate (4) Bad (5) Very bad	1
Sinkholes	The location of sinkholes relative to sheet pile assets. Major and minor sinkholes are determined by the depth and width of the sinkholes, as well as the number of sinkholes near the sheet pile assets.	(0) No sinkholes (1) Minor sinkholes (2) Major sinkholes	2
Existing barrier	The presence, type, and condition of existing barriers	(0) Good condition (1) Bad condition (2) No barrier	5

The results presented a distribution of weighted scores for each reach, as shown in Figure 1. This distribution allowed for an initial delineation of three categories, as shown in Figure 1. The MCA results were individually reviewed. Following the review, some modifications were made to the reach category scores to represent the hazard to public safety more accurately (Figure 2), as determined by our professional judgement and through discussions with the CRA and DPE.

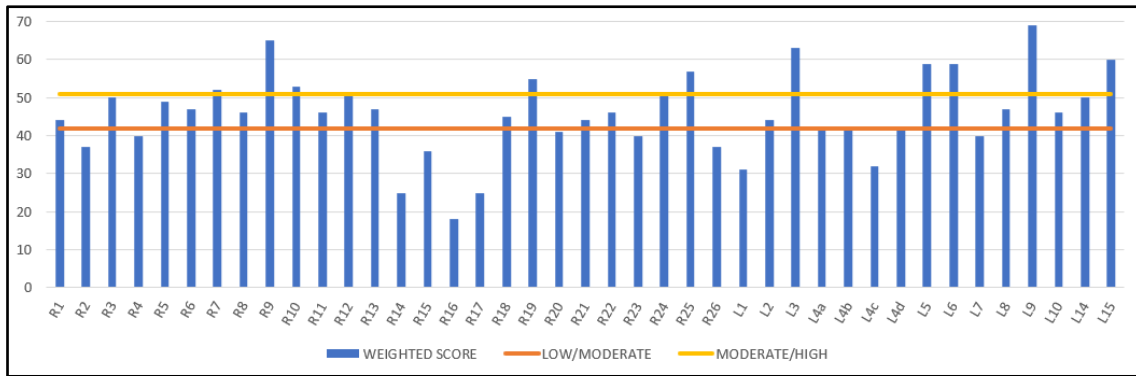


Figure 1. Distribution of weighted results

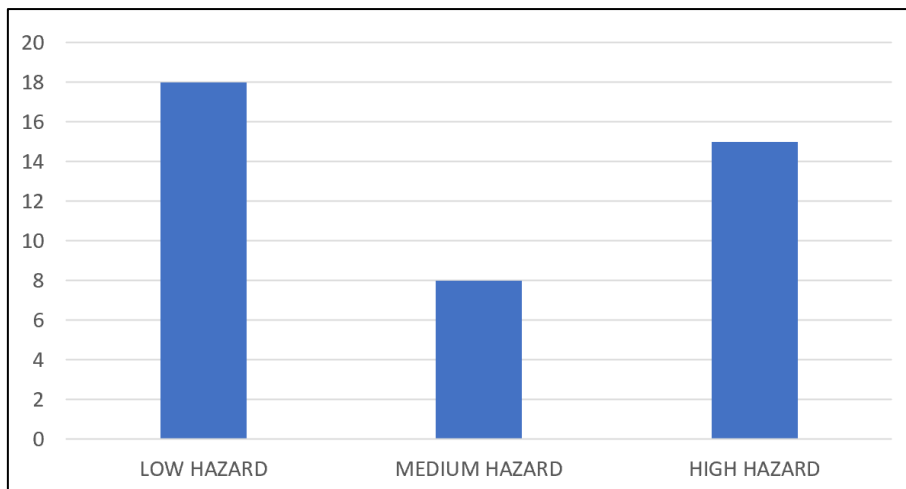


Figure 2. Final distribution of hazard category scores

A total of 18 reaches scored very well (numerical score under 42) indicating that there is currently a negligible to low safety hazard. A total of 8 reaches scored moderately (score between 42 and 51), which was interpreted as indicating there is some safety hazard, though not necessarily requiring urgent attention. A total of 15 reaches scored poorly (score greater than 51) and have been proposed as the reaches requiring urgent attention.

Examples of low hazard reaches are shown in Figure 3, including those where there is an existing fence or tree barrier or where there is no public pathway in the riparian corridor.



Figure 3: *Photographic examples of low hazard reaches*

The reaches scoring as medium hazard (shown in Figure 4) generally exhibited moderate to poor condition of the sheet piling. however, it is unlikely that people will access the sheet pile edges due to a moderate vegetation cover or a constructed barrier though in poor condition.

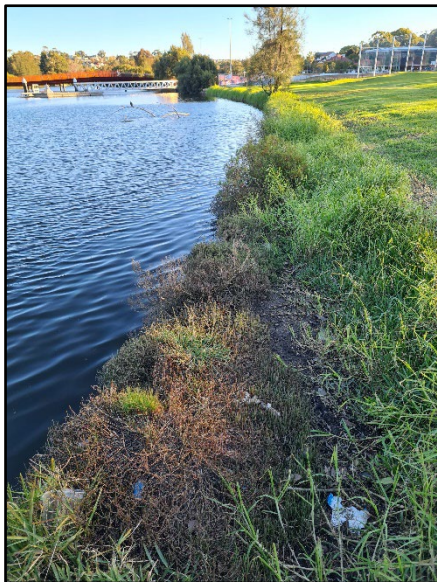
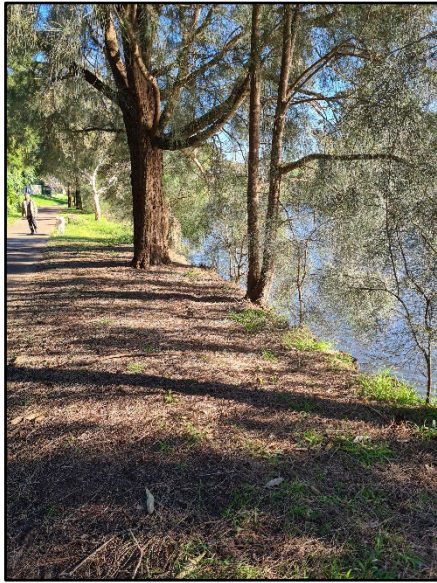


Figure 4: *Photographic examples of medium hazard reaches*

A common characteristic of the high hazard reaches (shown in Figure 5) is poor sheet pile condition, the lack of any barrier (be it natural or constructed), and regular public use of the land immediately adjacent.



Figure 5: *Photographic examples of high hazard reaches*

The modified MCA results were used to create a shapefile indicating the hazard rating for the different reaches of shoreline within the study, which is shown in Figure 6. These results are summarised in Table 2.

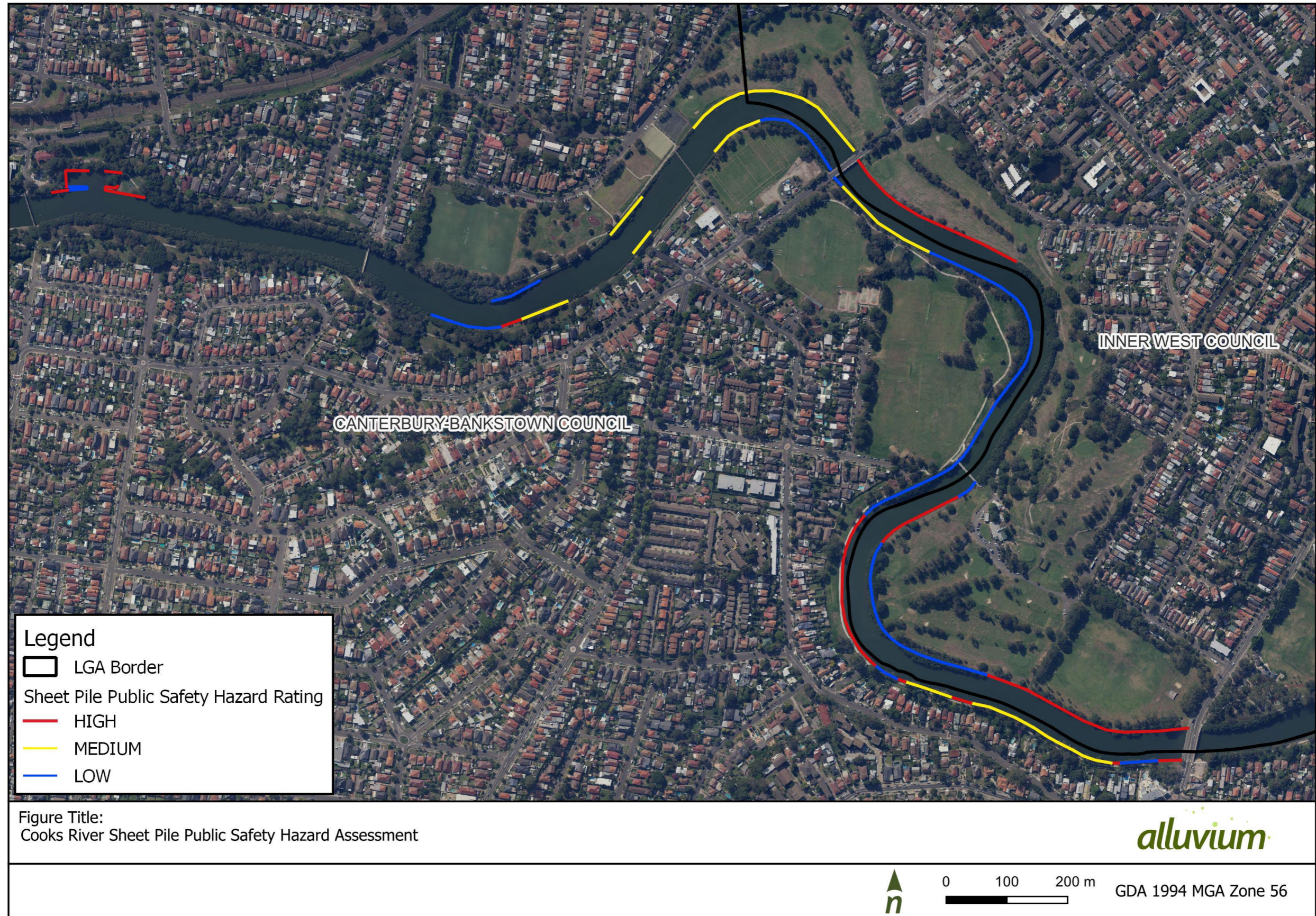


Figure 6. Results of sheet pile public safety hazard assessment

Table 2. MCA Results

Hazard rating	Left bank length	Right bank length	Total length
High	1.02 km	0.41km	1.43 km
Medium	0.40 km	0.73 km	1.13 km
Low	0.53 km	1.05 km	1.57 km

2.4 Step 4: Management recommendations

The modified MCA results were used to determine the shoreline areas requiring urgent management action and appropriate management options. It must be noted again that the proposed management actions were devised to address the public safety hazard associated with the sheet piles only. They are not intended to present a comprehensive and long-term bank management solution. Long-term solutions will be developed as part of the main Waterway Asset Condition Assessment scope of works.

Locations requiring urgent management

We recommend that urgent management measures are implemented at all shorelines scored as high hazard in the MCA. The reaches that scored a high hazard category were those with little or no barrier excluding people and an exposed edge of the sheet pile. The reaches receiving a score of low or medium, generally have an existing constructed barrier such as a fence, sheet pile capping, and/or natural barriers such as trees or wide-open space zones. These barriers mean that public access is not easy nor evident and as a result works are not perceived to be urgent. The high hazard shoreline reaches amount to a total of 1.43 km of shoreline in a total of 15 reaches, as shown in Figure 6.

Management Options

A variety of management measure types were considered including fencing, installation of rock to deter people from the shoreline edge and planting of a vegetation buffer to exclude people from the shoreline edging. A fence was determined to be the most appropriate option for providing an immediate measure to discourage people from accessing the sheet pile. Fences are also a relatively low-cost option that can be easily removed when a permanent bank management strategy is implemented. Table 3 highlights the length of high hazard reaches in each of the two LGAs and the related cost to install fencing (assuming timber post fencing with a cost of \$65/m).

Table 3. Distribution of high hazard reaches and management costs by LGA

LGA	Left bank length	Right bank length	Total length	Cost
<i>Canterbury Bankstown Council</i>	0.21 km	0.41 km	0.61 km	\$40,000
Inner West Council	0.81 km	0.00 km	0.81 km	\$53,000

Additionally, fences can also help to create a vegetated barrier by providing an unmown strip between the fence and the sheet pile. The strip could be planted out, or simply left for the existing groundcover species to establish. An example of where this has been done was observed on the upstream most part of Marrickville Golf Course (Figure 7).



Figure 7: *Example of a vegetated barrier*




The other options were deemed less appropriate for the following reasons:

- Significant engineering works such as the installation of rock would require a structural and geotechnical investigation of the site, which would delay the ability to implement the urgent works.
- Solely planting vegetation buffers would take time and require an establishment period, with a risk of failure.

3 Details of proposed management measure

The proposed method to urgently address the public safety issue is to install a fence that deters people from accessing the exposed sheet piling. Installation of signage should be included to communicate that the fencing is to ensure public safety and is a temporary solution. It is recommended that the fence is installed a minimum of one metre away from the sheet pile edge to achieve an appropriate offset, or such that they exclude people from the subsidence holes (whichever is greater), and to provide a safe working environment for the fence installers. There are several options for the type of fence. Table 4 provides a summary of the different fence types, including a cost comparison based on unit rate estimates which were obtained from Rawlinsons Australian Construction Handbook (2022).

Table 4. Summary of fence type alternatives

Fence type (1.2m height)	Approximate cost to install at all high hazard reaches
<p><i>Stud framed – Chainwire clad</i></p> 	\$30/m
<p><i>Barrier mesh with pickets at 3000mm centres</i></p> 	\$20/m
<p><i>Galvanised welded mesh roll with tubular posts</i></p> 	\$105/m
<p><i>Tubular steel landscape fence, pre-painted, posts set in concrete</i></p>	\$120/m



Geofabric fence, 300mm depth in trench, includes timber pickets at 3000mm centres



Timber post fence (half logs)



\$50/m

\$65/m

A key consideration when selecting a fence to be installed next to a river is its capacity to resist shear stresses associated with flood flows. Whilst harder engineering solutions such as steel fences have better structural resistance to failure in a flood than a timber picket fence, they would also potentially obstruct flood flows, which could have a negative impact on flood hydraulics.

On a balance of cost, sustainable material selection, visual appearance, resistance to flood flows and a low chance of blocking flood debris, we propose a timber post fence be installed. The estimated installation cost to install these at all high-risk shoreline is approximately \$93,000. This does not include any contingency. A concept sketch of the proposed mitigation measure is shown in Figure 8.

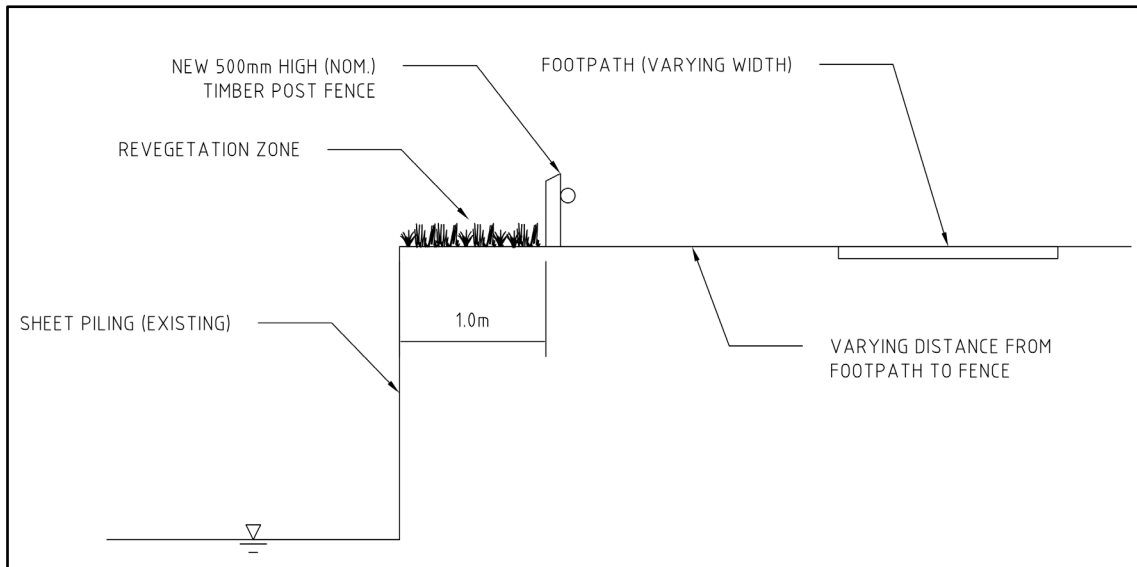


Figure 8. Sketch of potential fence layout