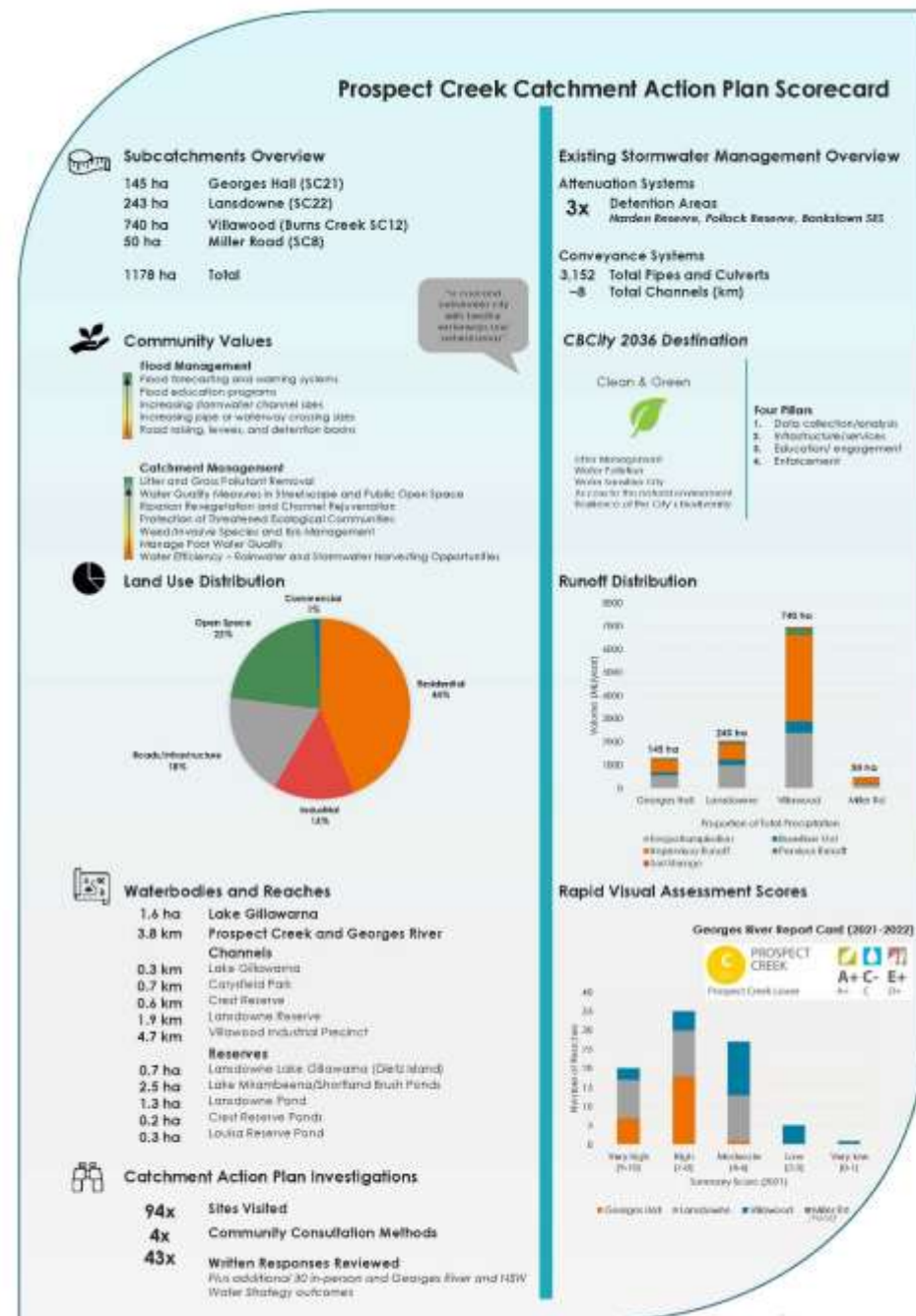


Prospect Creek CAP

*Real World Data Meets
Modelled Flood Impacts
and Water Quality*





Acknowledgement of Country

*Darug People of Canterbury-Bankstown
and Wonnarua People of Hunter Valley*

Stantec's Reconciliation Journey
by Chern'ee Sutton





Acknowledgments





Meet the Team



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Water Resources Group Lead

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Eric Lin

Water Resources Team Lead

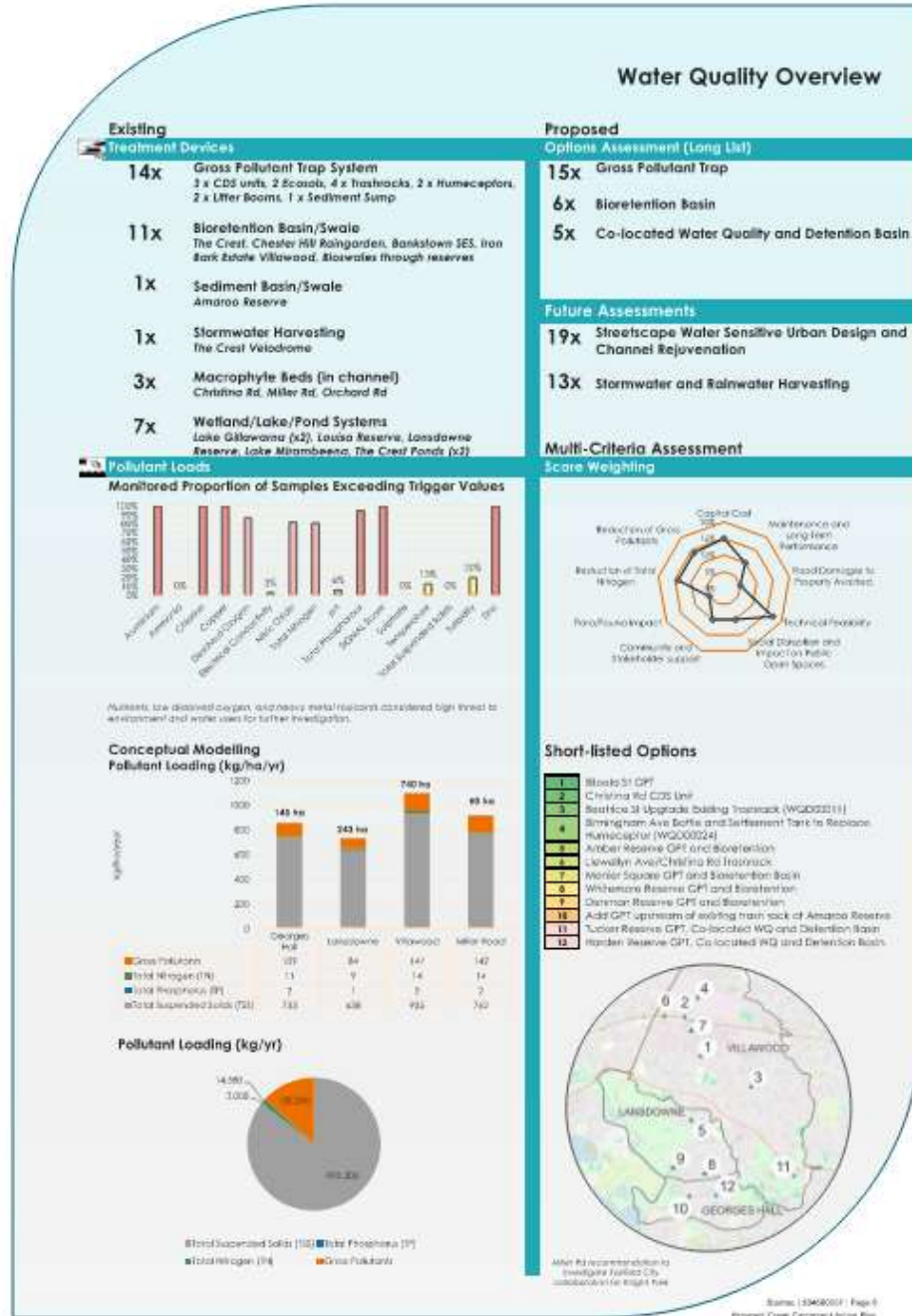
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Sumari Veal

Water Resources Team Lead

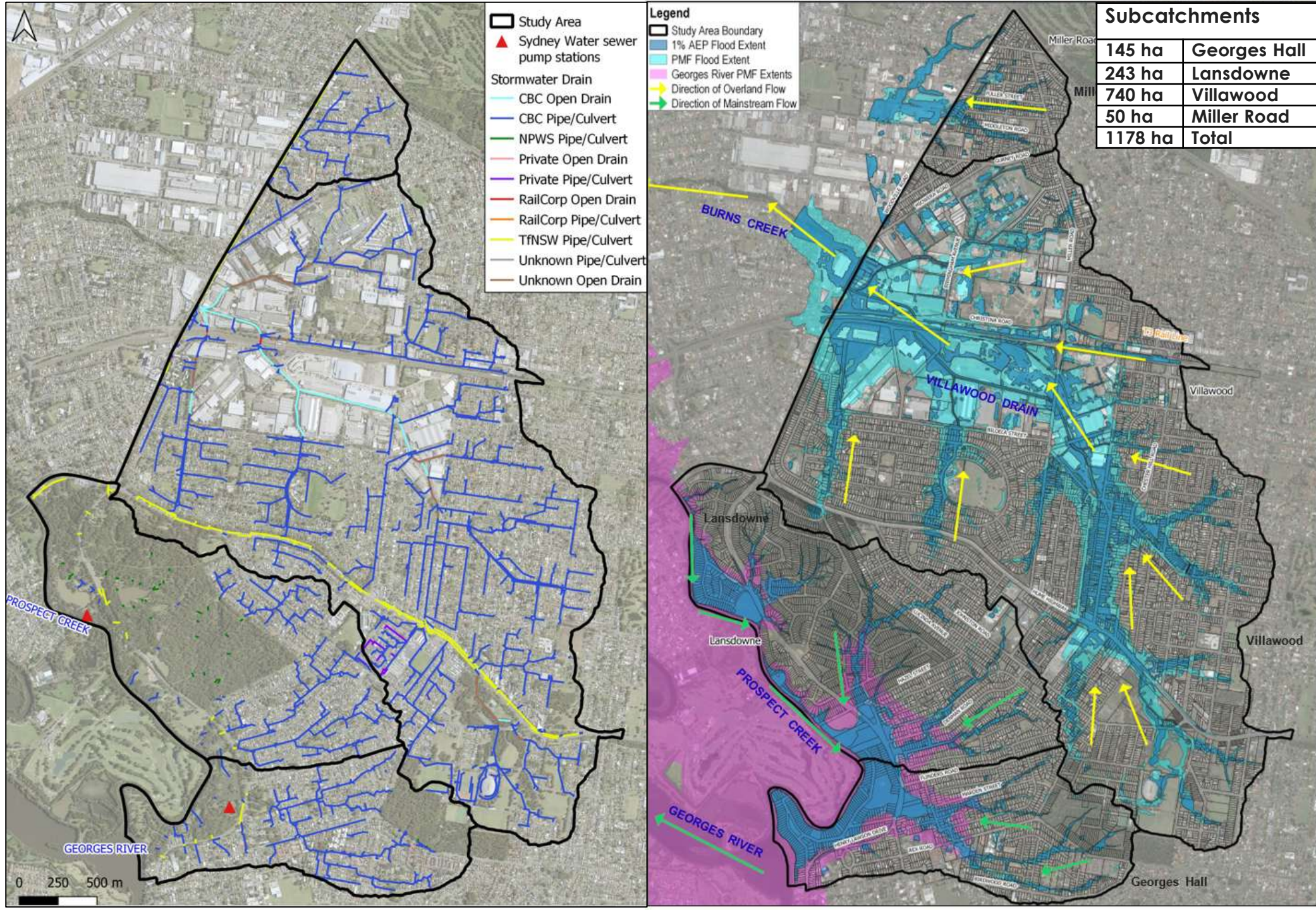
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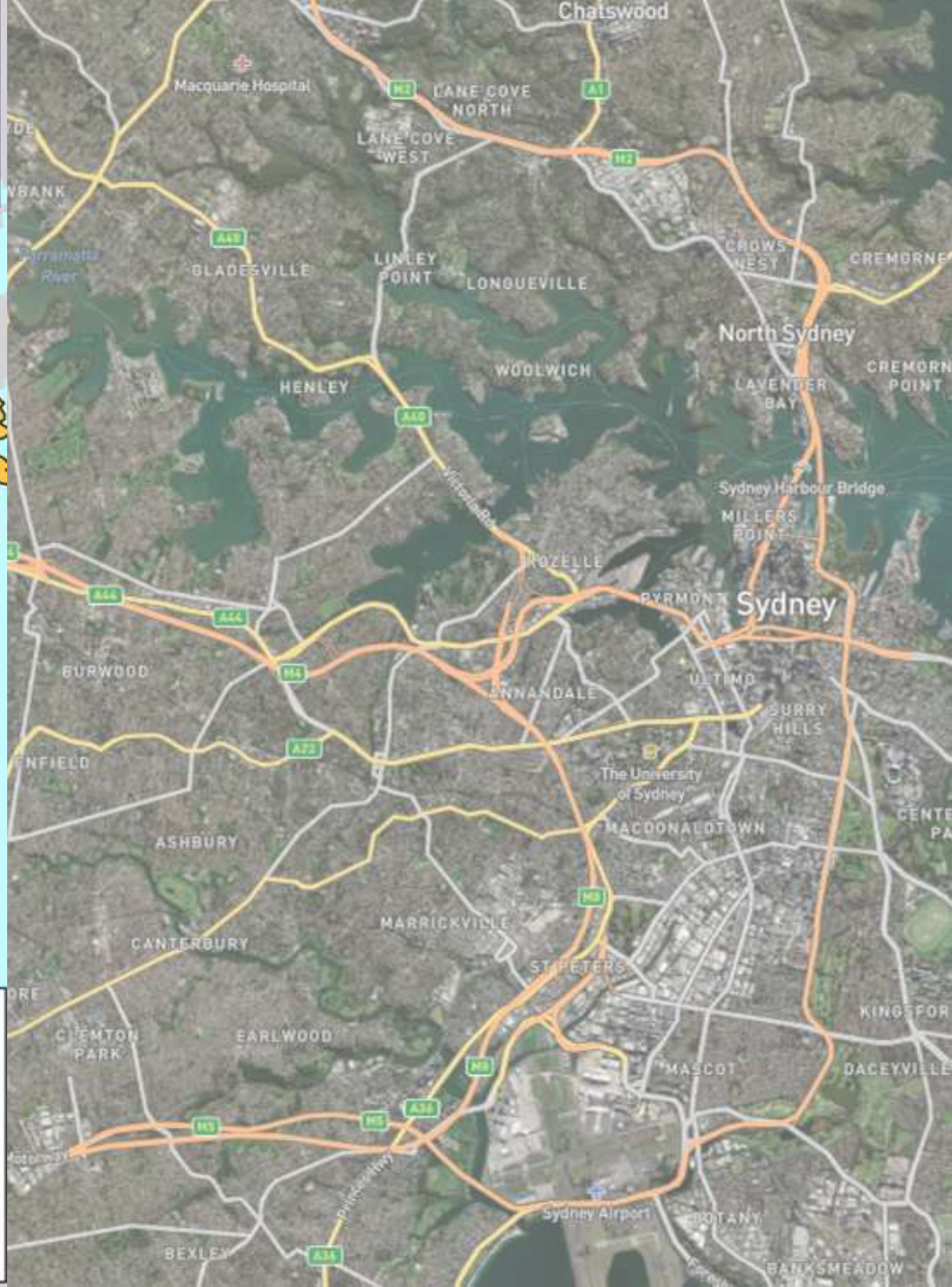
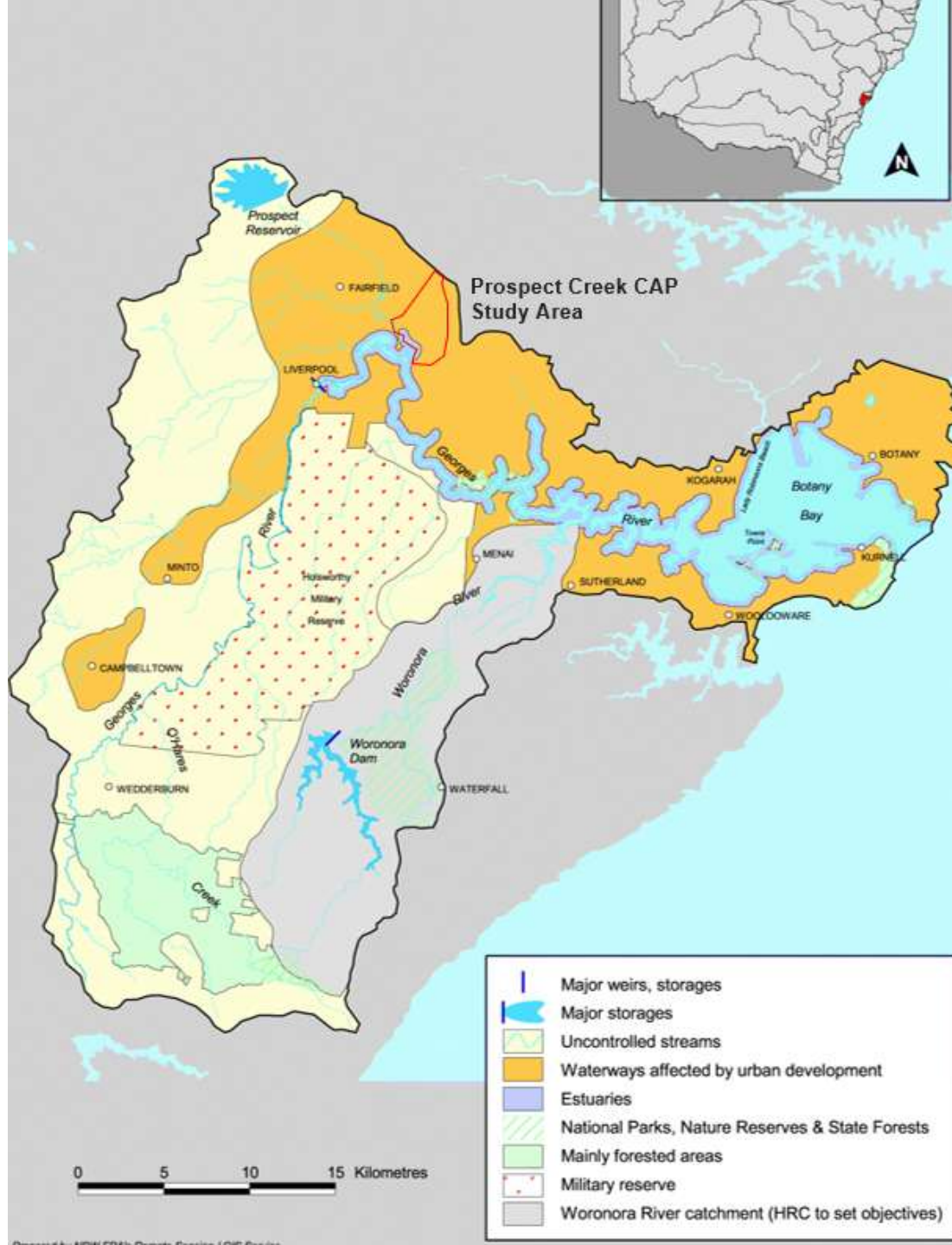
Agenda

1. Catchment Overview
2. Project Summary
3. Looking through the lens:
 - a) Community values
 - b) Strategic context
 - c) Waterways and land use
4. Opportunities and Constraints
5. Options Assessment
6. Final Recommendations
7. Key Messages and Learnings

Catchment Overview



Catchment Overview





Project Overview

Literature Review

Desktop Analysis

Catchment Profiling

Opportunities and Constraints

Mass Balance and Data Analytics

Optioneering

Multi-Criteria Assessment

Final Options and Plan to Implement



Investigations

30+ Documents Reviewed

20+ GIS files Reviewed

94x Sites Visited

4x Community Consultation Methods

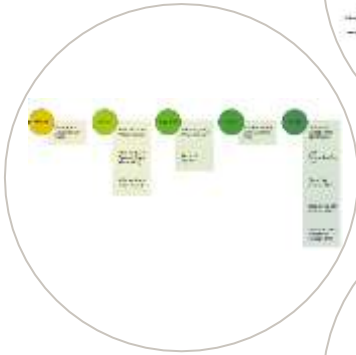
43x Written Responses Reviewed
Plus additional 30 in-person and Georges River and NSW Water Strategy outcomes

100+ Long List of Options
Refined to Short-listed 15

Community



Strategic Context

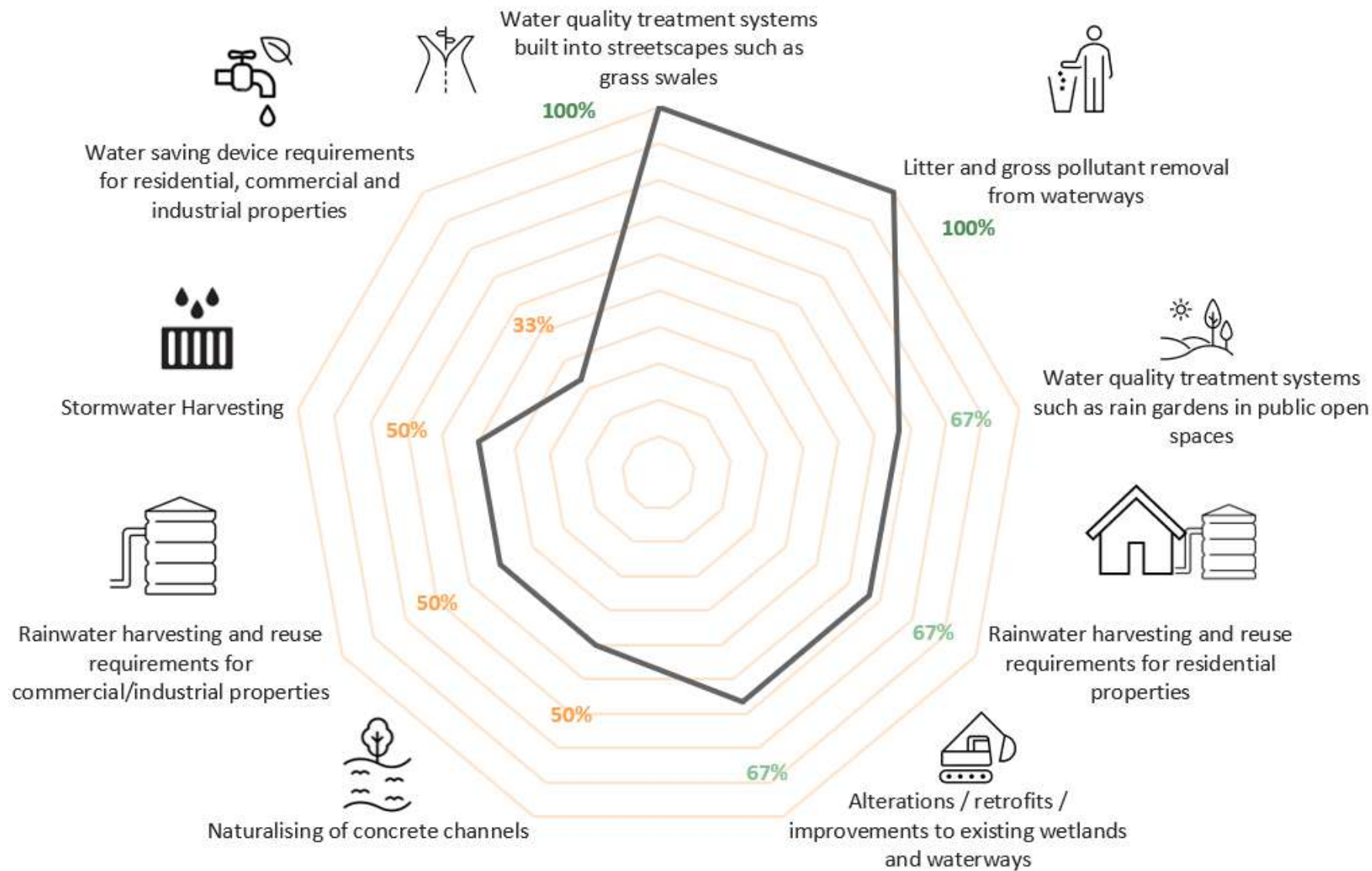


Let's look through the lens...

Waterways & Land Use



Survey Responses





Community Values

Flood Management



- Flood forecasting and warning systems
- Flood education programs
- Increasing stormwater channel sizes
- Increasing pipe or waterway crossing sizes
- Road raising, levees, and detention basins

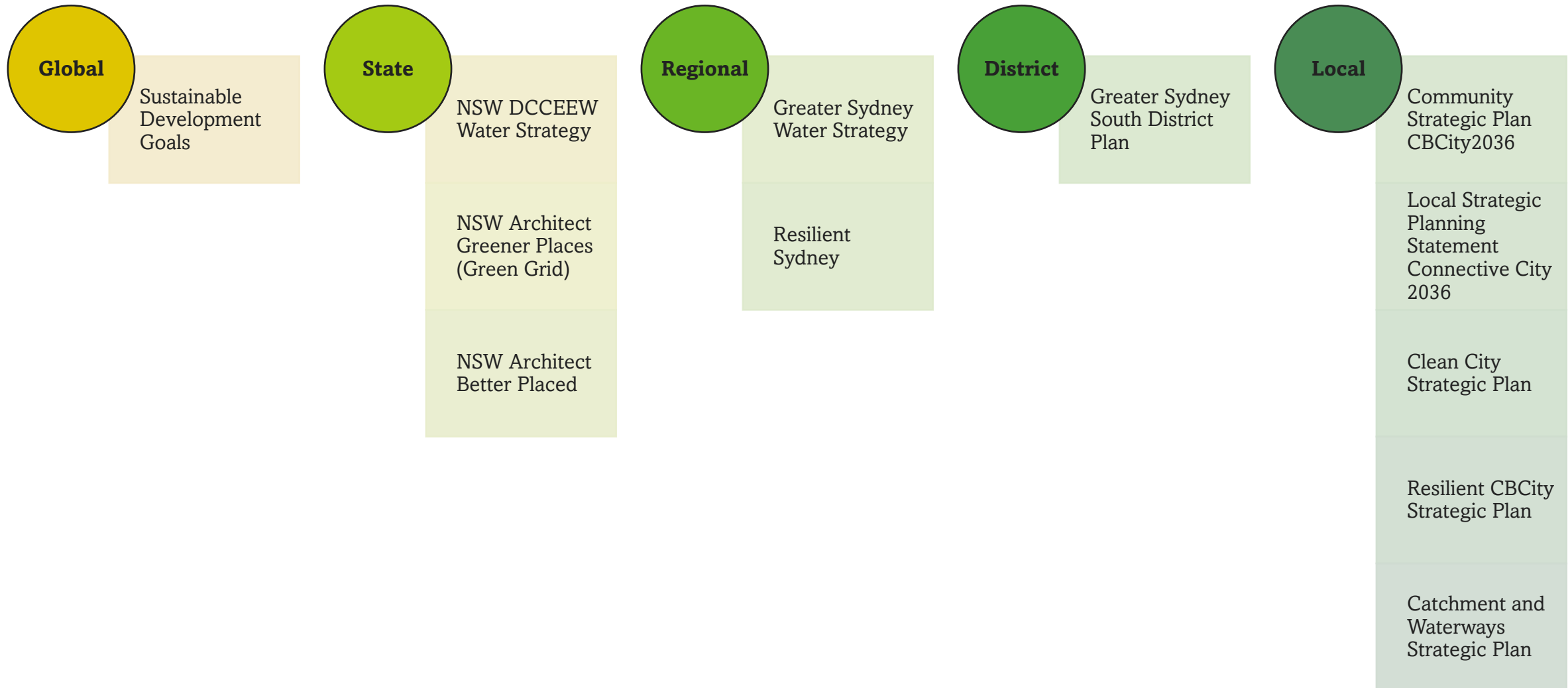
Catchment Management

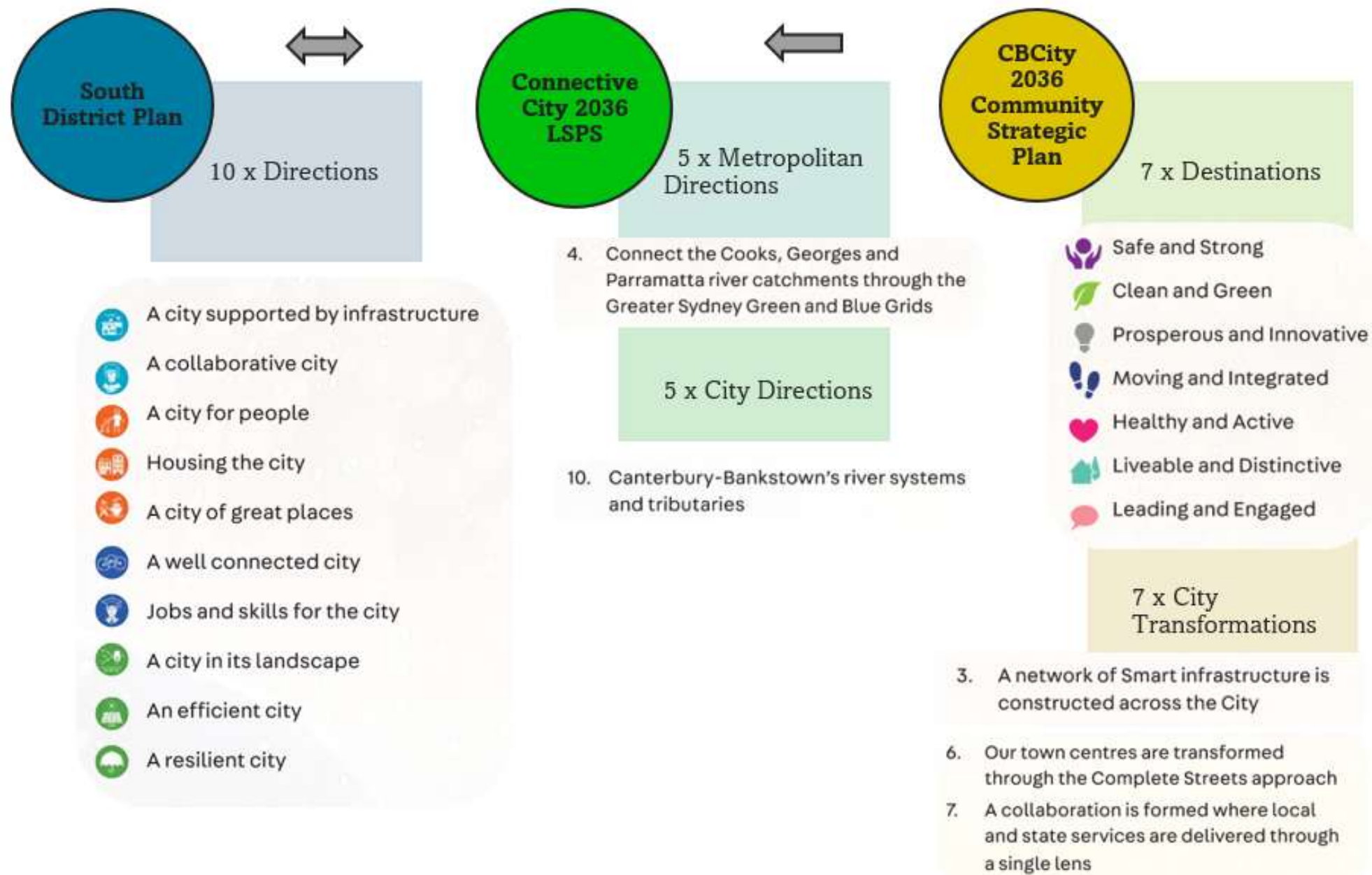


- Litter and Gross Pollutant Removal
- Water Quality Measures in Streetscape and Public Open Space
- Riparian Revegetation and Channel Rejuvenation
- Protection of Threatened Ecological Communities
- Weed/Invasive Species and Ibis Management
- Manage Poor Water Quality
- Water Efficiency – Rainwater and Stormwater Harvesting Opportunities

“a cool and sustainable city with healthy waterways and natural areas”

Global to Local Indicators





Global to Local Indicators

Global		State						Regional			District		Local							
SDG	Core Objective	Priority	NSW DCEEW Water Strategy	Actions	Objective	NSW Architect Greener Places (Green Grid)	Objective	NSW Architect Better Placed	Priority	Greater Sydney Water Strategy	Actions	Direction	Resilient Sydney	Direction	Greater Sydney South District Plan	Planning Priorities	Destination	CBCity2036	CBCity2036 Destinations and Transformations Connective City 2036 Priorities, Evaluations and Actions Clean City Strategic Plan Catchment and Waterways Strategic Plan Actions Resilient CBCity Strategy	Indicators
 	Economic Stewardship and Funding Contribute to a strong level-of-service based economy with equitable inter-generational water management benefits. Prioritise opportunities that achieve multiple goals and futureproofing. 	5	Support economic growth and resilient industries within a capped system	5.1 Provide greater certainty to regional businesses that rely on secure access to water 5.2 Invest in R&D and new technologies to lift water productivity in NSW industries 5.3 Improve the operation and transparency of water trade in NSW 5.4 Identify infrastructure and operational options for each region of NSW 5.5 Investigate causes of underuse and develop options to bring use back to cap	1	INTEGRATION Combine Green infrastructure with urban development and grey infrastructure 	5	BETTER WORKING Functional, efficient and fit for purpose 	5	Water management and services meet community needs.	5.3 Manage price impacts for customers	1	People centred city People are connected to where they live and able to access transport, affordable housing, education and employment opportunities ▪ Action 1: Shocks and stressors managed through planning for growth ▪ Action 6: Build community capacity through co-design	1	A city supported by infrastructure Infrastructure supporting new developments ▪ Planning Priority S1 Planning for a city supported by infrastructure	3	Prosperous & innovative A smart and evolving City with exciting opportunities for investment and creativity Covers themes such as revitalising our centres, training, employment, investment, being SMART and creative, and providing opportunities for cultural and economic growth	CBCity 2025 Delivery Program 2022-25 Priorities: ▪ Planning for the digital future of the City, pursuing Smart City innovations and encouraging growth of innovation in the education and manufacturing sectors. Transformation 3: network of smart infrastructure Connective City 2036 Evolution 3 Places for Commerce and Jobs Priorities: ▪ Increase job numbers, choice and diversity. ▪ Attract investment in health, education, research and technology. ▪ Protect and enhance employment lands. ▪ Increase the number of people living and working in the City. ▪ Locally connect centres to their catchments. ▪ Connect Bankstown and Campsie to Greater Sydney. Connective City 2036 Evolution 6 Urban and Suburban Places, Housing the City Priorities: ▪ Establish a clear hierarchy of centres to provide a framework for future growth and character ▪ Locate 80 per cent of new housing within walking distance of mass transit/train stations ▪ New housing in neighbourhoods and suburbs will maintain local character and landscape ▪ Provide housing choice to suit each life stage through a range of housing typologies, sizes and tenures ▪ Provide affordable housing typologies, especially for very low, low and moderate-income households ▪ Aim for design excellence Connective City 2036 Evolution 10 Governance and Funding Priorities: ▪ Effectively align infrastructure funding and delivery with growth ▪ Establish a clear picture of future places and their infrastructure needs ▪ Support the creation of great places through an infrastructure funding framework ▪ Use the land development process as a funding mechanism for quality infrastructure ▪ Advocate and collaborate with State agencies and the private sector to coordinate infrastructure	Evolution 3 (Commerce) Number of Jobs: ▪ 17,208 Manufacturing ▪ 19,251 Health Services ▪ 15,649 Retail ▪ 14,845 Construction ▪ 6,553 Transport ▪ 14,042 Education ▪ 24,777 Other Evolution 6 (Places): ▪ 500,000 residents ▪ 160,669 dwellings ▪ 80% dwelling in centres ▪ 15% dwellings for small households ▪ 7% households in housing stress (reduced from 18.6%) Evolution 10 (Governance and Funding): ▪ 100% Social infrastructure assessments conducted during master planning for all renewal precincts ▪ 100% Infrastructure funding plans are developed and endorsed by funding bodies during master planning for all renewal precincts	
		7		7.1 Pilot new technologies to increase our water options 7.2 Collaborate to harness new research, innovation and technology 7.3 Invest in water sector workforce and capability	3	MULTI-FUNCTIONALITY Deliver multiple ecosystem services simultaneously 	6	BETTER VALUE Creating and adding value 	7		Jobs and skills for the city Creating the conditions for a stronger economy	7	Jobs and skills for the city Creating the conditions for a stronger economy	9	An efficient city Using resources wisely ▪ Planning Priority S17 Reducing carbon emissions and managing energy, water and waste					

Key Objectives



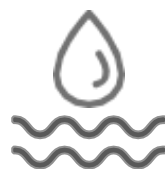
Governance and Engagement

Transparency and accountability to engender community trust. Cross-agency and multi-department collaboration.



Culture

Cultural values respected and protected and giving effect to Aboriginal rights and access to water. Encourage enduring cultural and social connection to waterways for all.



Ecosystem Health

Water sources, waterways, floodplains and ecosystems protected. Manage stormwater as an integral part of the total water cycle balance and re-naturalise catchment hydrology where possible.

Key References: DCCEE NSW Water Quality and River Flow Objectives, Botany Bay Catchment Water Quality Improvement Plan Targets and ANZECC for Fresh and Marine Water Quality Guidelines

Key Indicators: Water Balance, Runoff Volumes, Water Quality, Biodiversity, Riparian Vegetation, Litter, Weeds, Sediment and Erosion

Key Objectives



Resilience, Human Health, and Liveability

Liveable and vibrant towns and cities by protecting public health and safety with resilience to changes in water availability, flooding and climate.

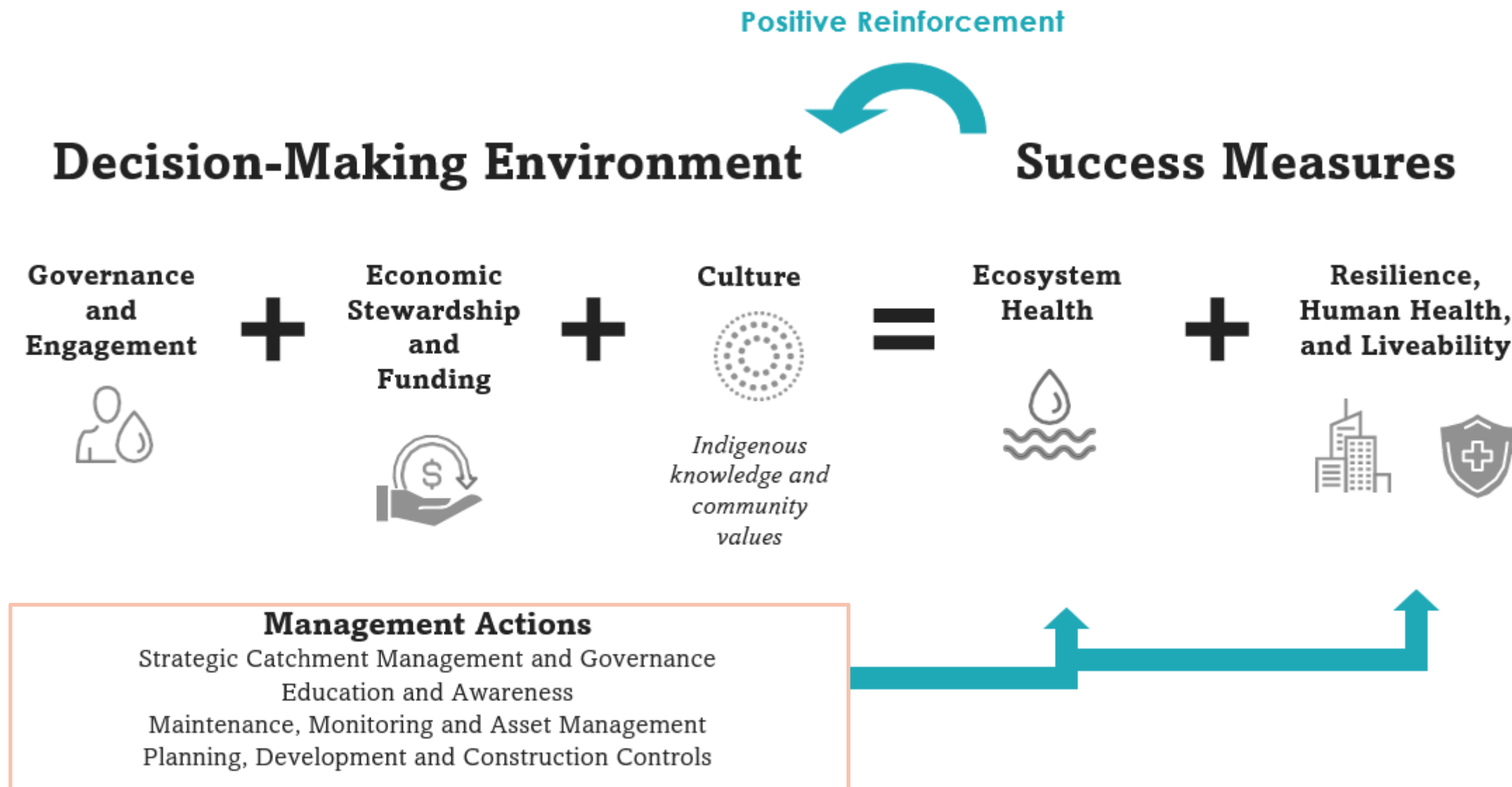
Key Reference: Guidelines for Managing Risks in Recreational Water

Key Indicators: Flood Hazard, Water Availability, Public Health, Infrastructure Resilience, Urban Heat Island

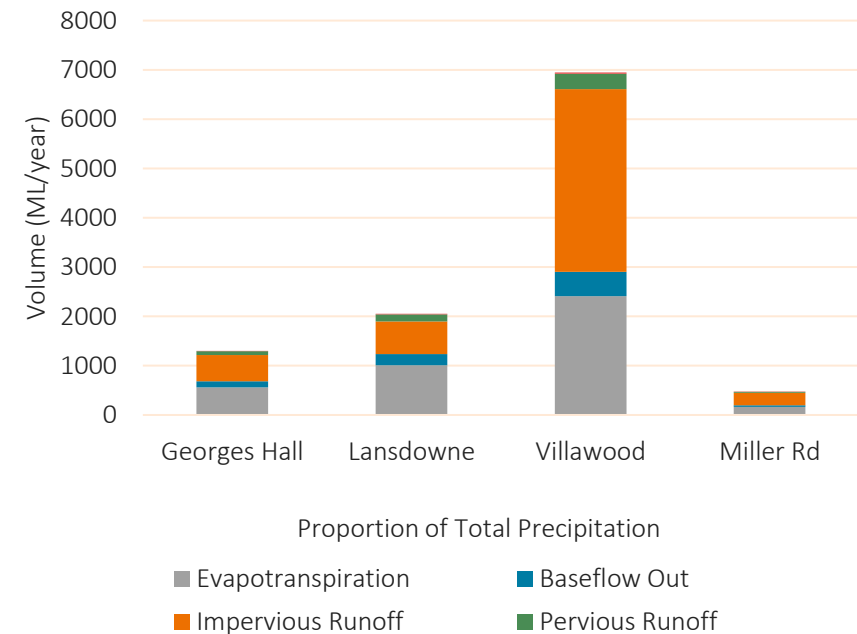
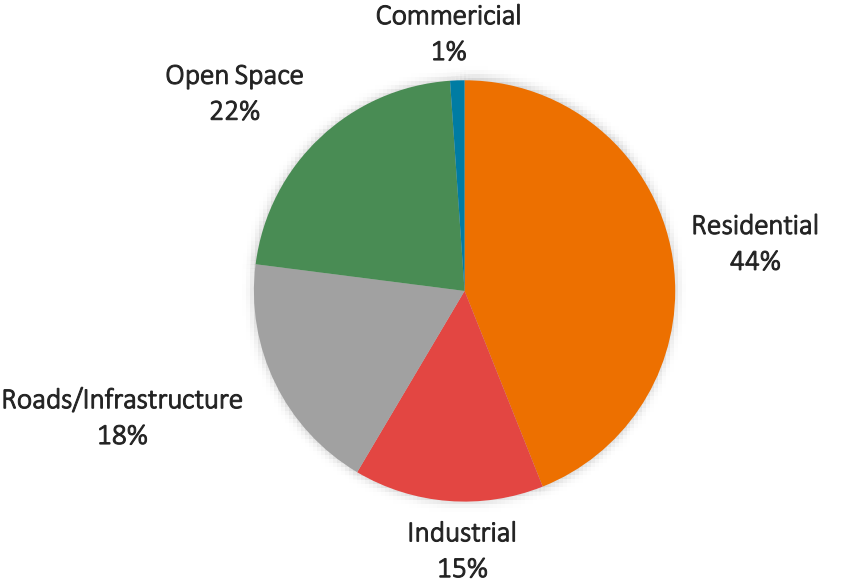
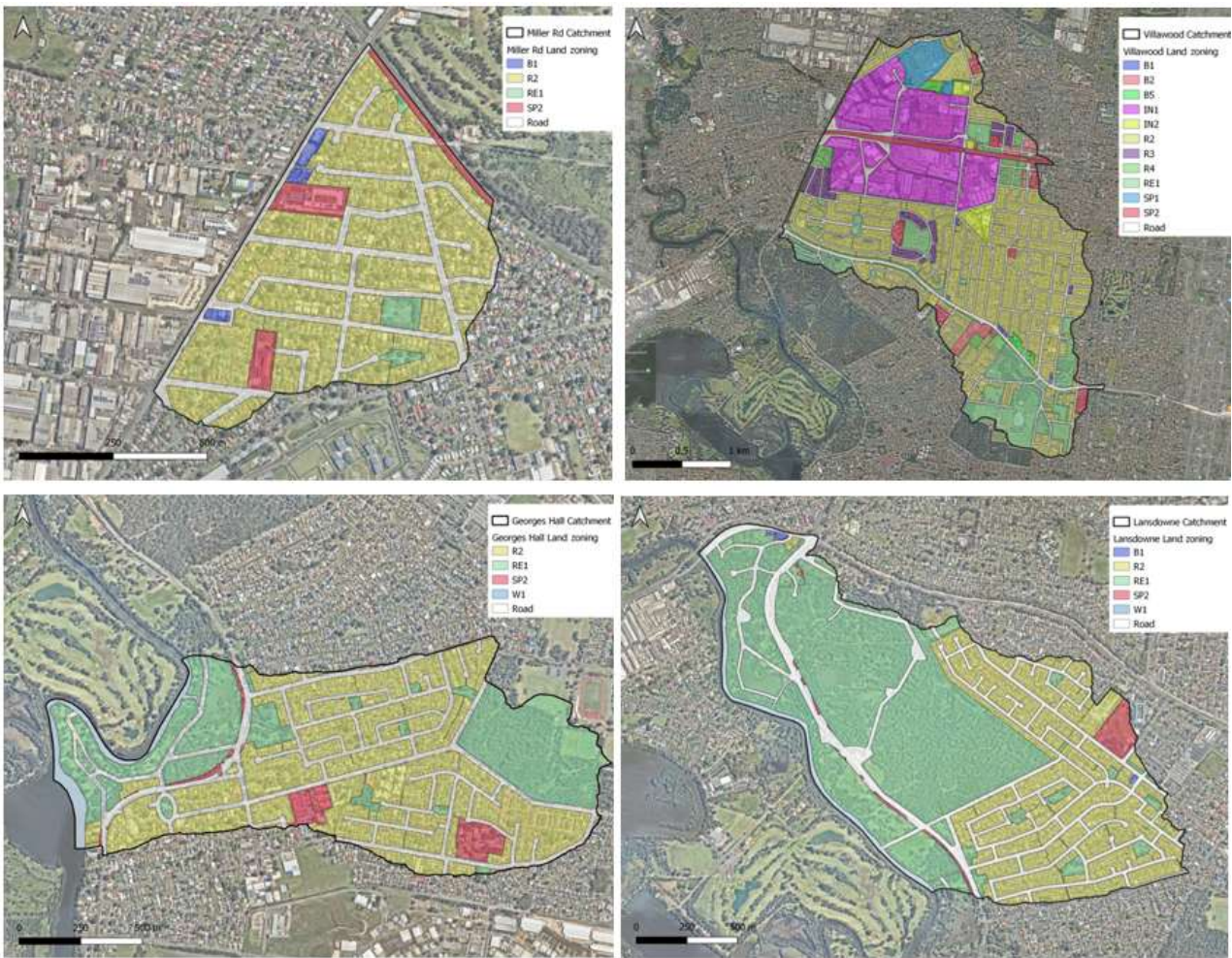


Economic Stewardship and Funding

Contribute to a strong level-of-service based economy with equitable inter-generational water management benefits. Prioritise opportunities that achieve multiple goals and futureproofing.



Land Use



Waterways

Management of waterways, waterbodies and the broader impact to the Georges River Estuary was a core motivation of this CAP.

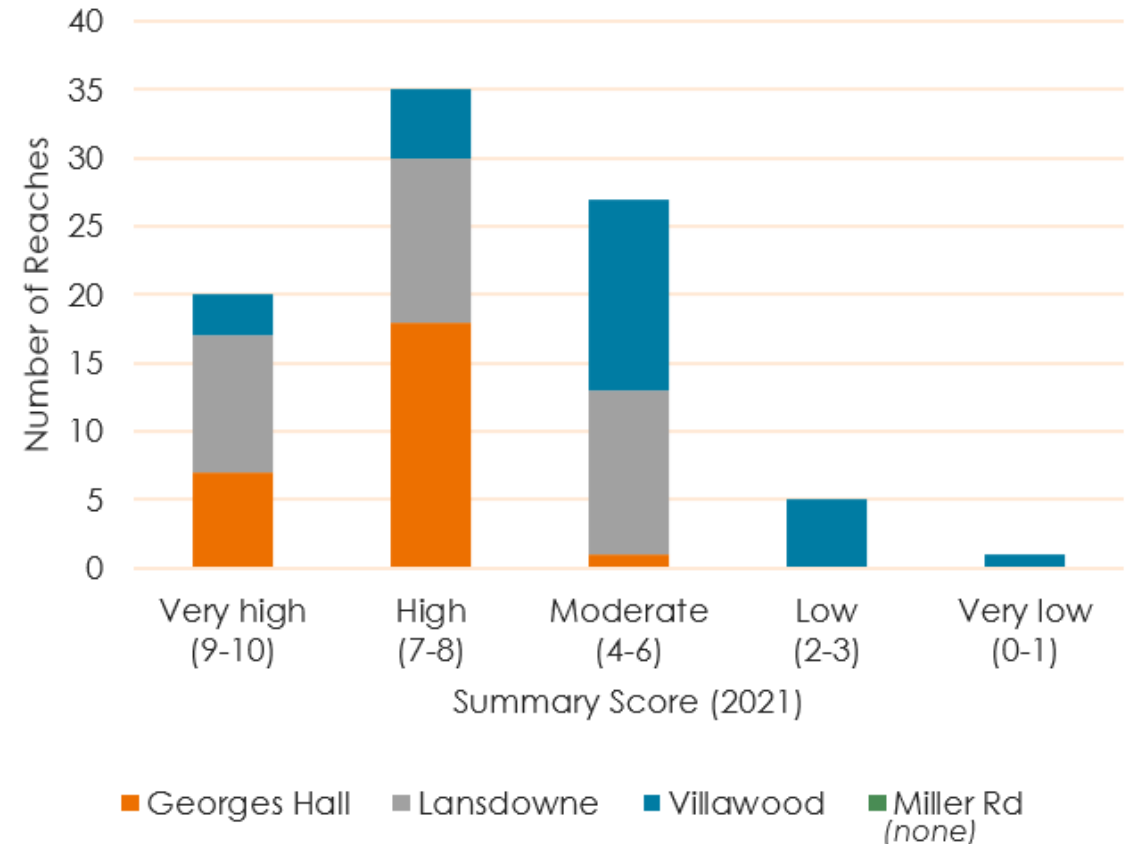
Waterbodies and Reaches

1.6 ha	Lake Gillawarna
3.8 km	Prospect Creek and Georges River Channels
0.3 km	Lake Gillawarna
0.7 km	Carysfield Park
0.6 km	Crest Reserve
1.9 km	Lansdowne Reserve
4.7 km	Villawood Industrial Precinct
Reserves	
0.7 ha	Lansdowne Lake Gillawarna (Dietz Island)
2.5 ha	Lake Mirambeena/Shortland Brush Ponds
1.3 ha	Lansdowne Pond
0.2 ha	Crest Reserve Ponds
0.3 ha	Louisa Reserve Pond

Georges River Report Card (2021-2022)



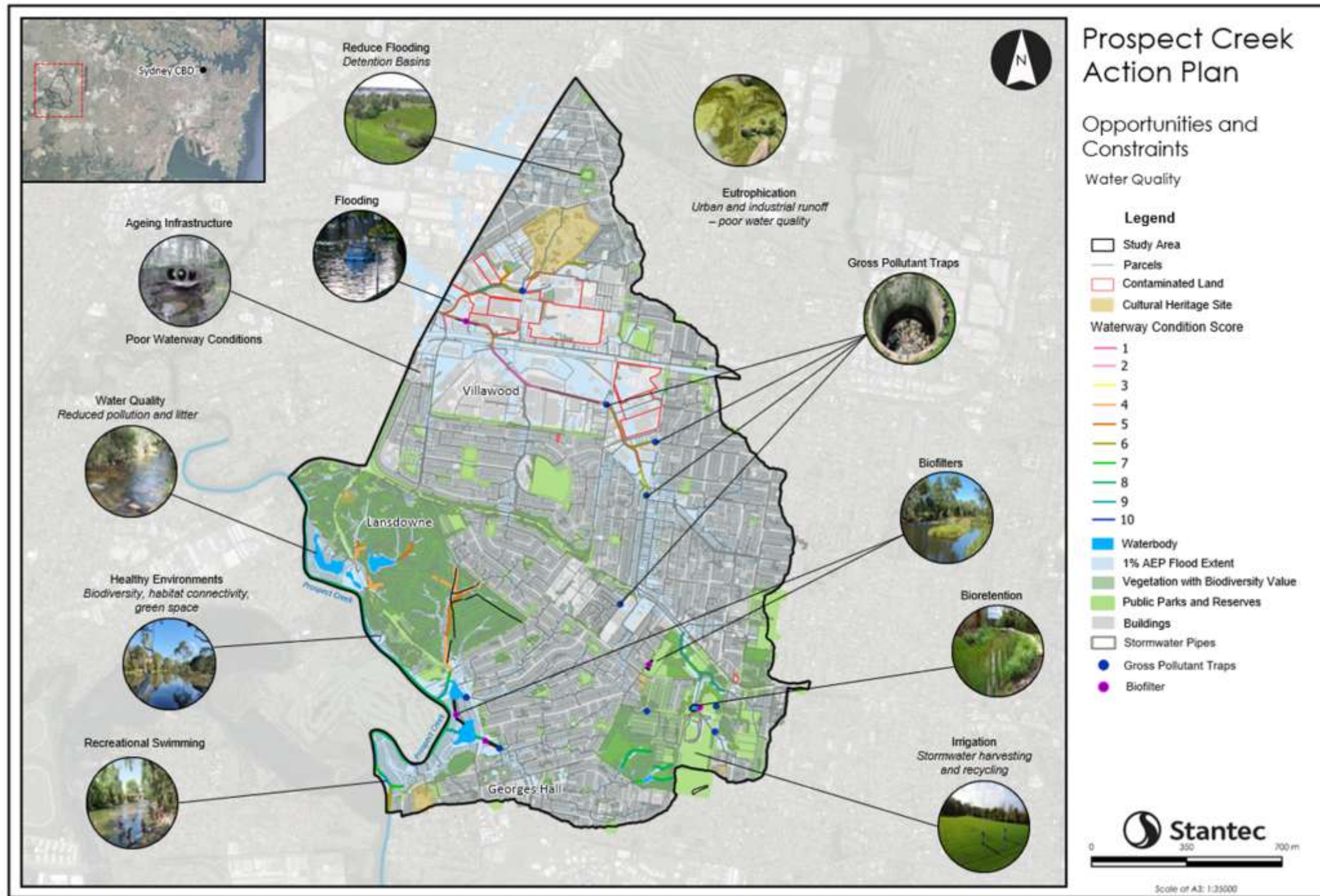
Rapid Visual Assessment Scores

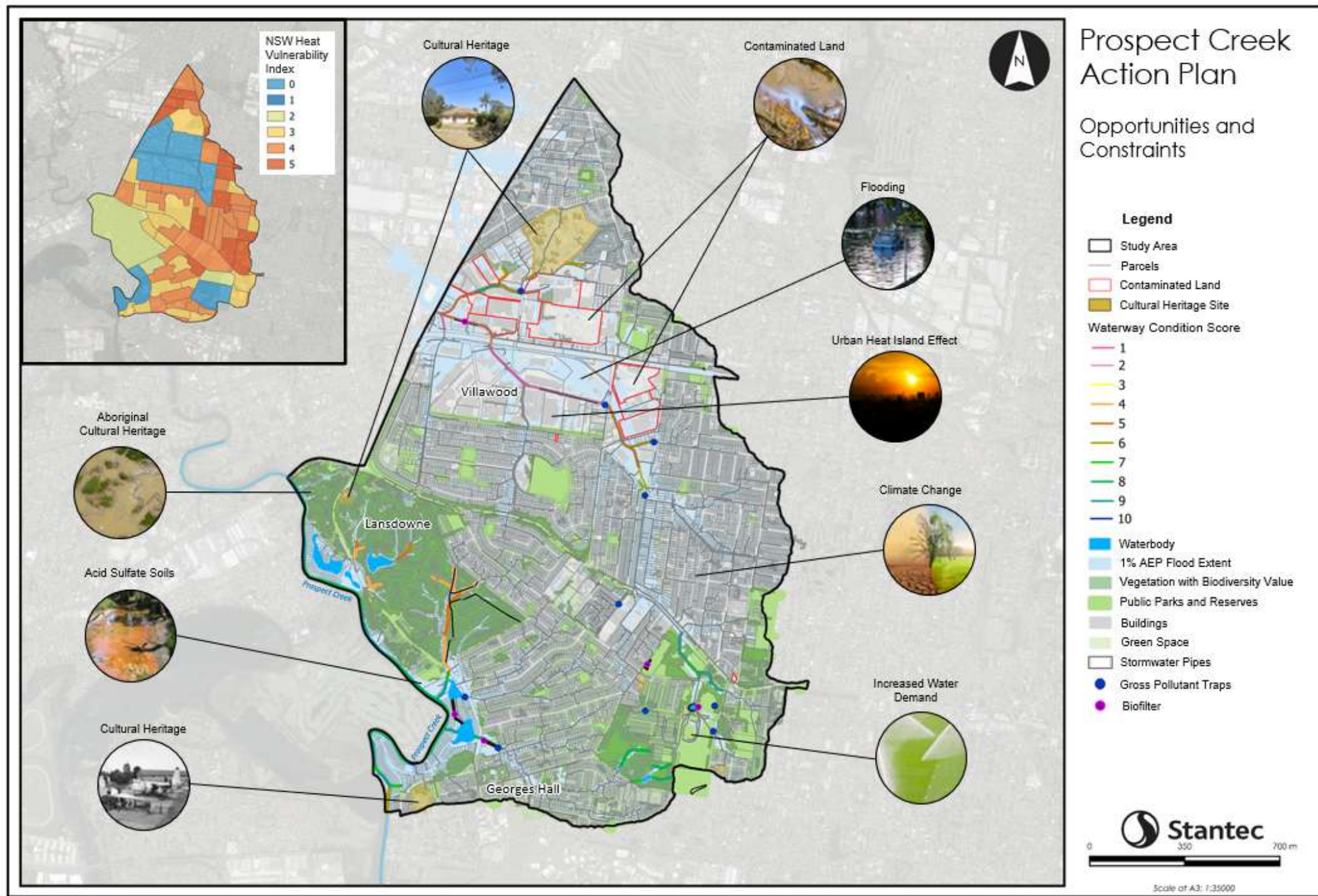


Catchment Profiling

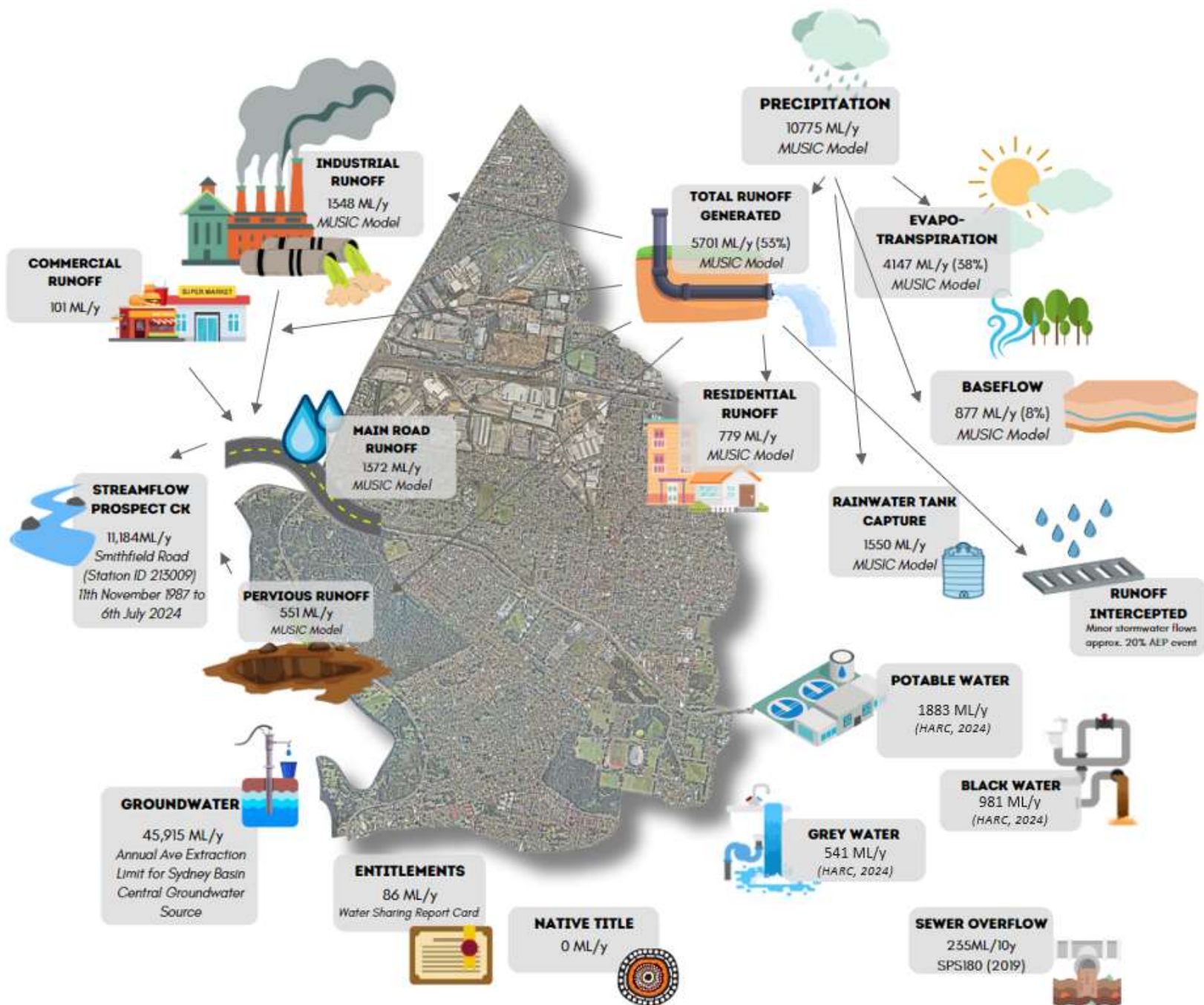
Core CAP Objective	Ecosystem Health	Resilience, Human Health, and Liveability
Global to Local Strategic Relevance	          	
Key CAP Targets	NSW Water Quality and River Flow Objectives Botany Bay Water Quality Improvement Plan Targets Australian and New Zealand Guidelines for Fresh and Marine Water Quality Guidelines Guidelines for Managing Risks in Recreational Water	

- **Waterways, Waterbodies, Wetlands and Estuaries**
- **Existing Stormwater Systems and Drainage Mechanisms**
- **Water Quality and Pollution**
- **Flooding**
- Existing Irrigation, Water and Sewer Infrastructure
- **Topography**
- **Climate, Emissions and Future Resilience**
- **Soil, Erosion and Groundwater**
- **Land Use, Public Reserves, Transport and Urban Form**
- **Flora and Fauna**
- Heritage and Cultural Sensitivity
- Demography and Community Needs
- **Maintenance and Monitoring Practices**
- **Governance and Funding**
- Planning Controls and Construction Compliance and Enforcement
- Community Engagement and Education





MB & Data Analytics



Flood Analysis

FRMS&P undertaken in parallel with this CAP applies the NSW Flood Risk Management Manual (2023) and the Flood Prone Land Policy guide. A climate change assessment was incorporated, addressing the medium priority Catchment and Waterways Strategic Plan (2024) Action 6.1.6.

Sydney Water and Bureau of Meteorology Rainfall Gauges (average annual)

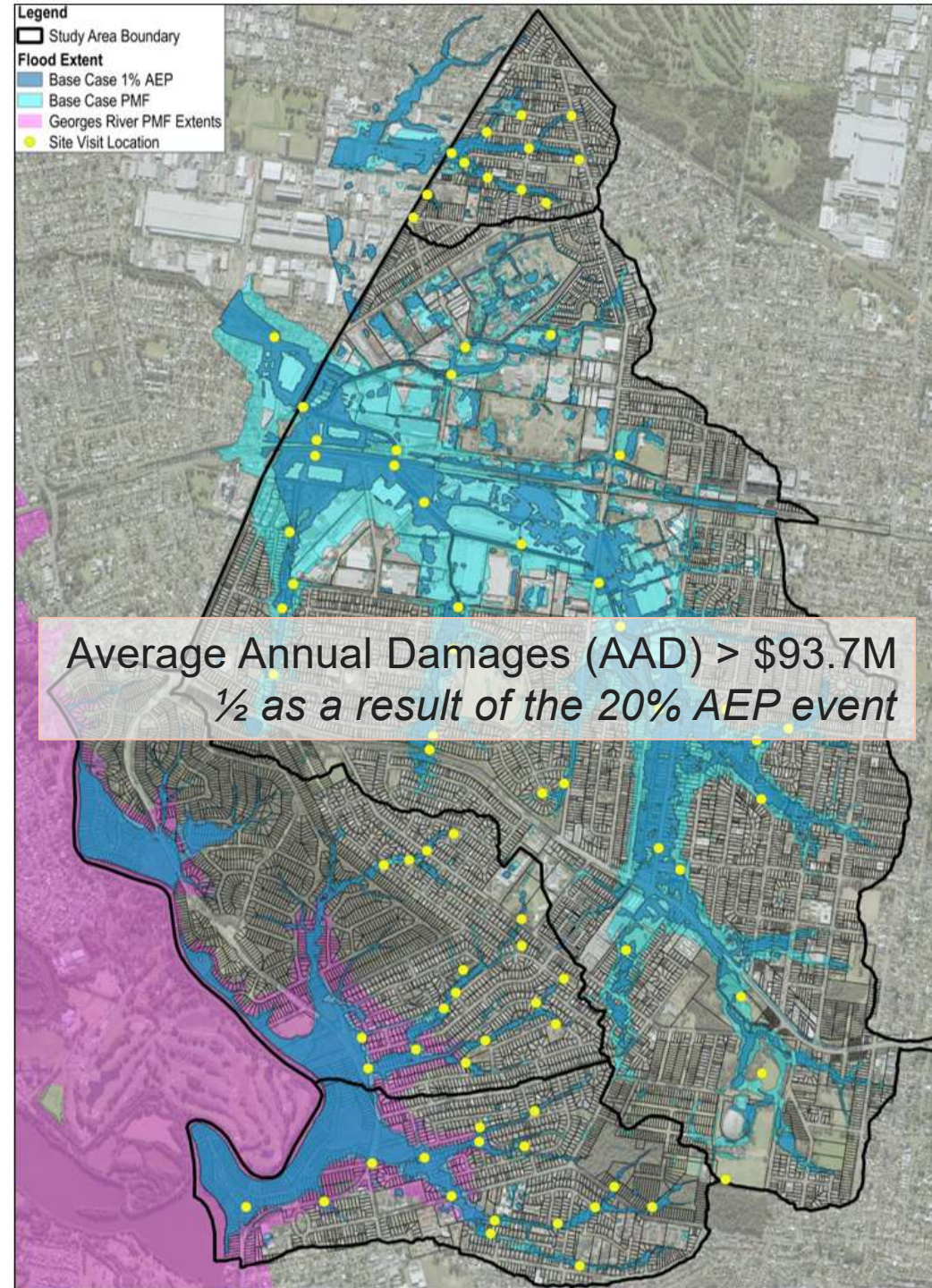
- Bankstown Airport AWS (the Bureau 1968-current): 887.6 mm
- Rosnay Golf Course (Sydney Water 1989-current): 796.3 mm
- Fairfield STP (Sydney Water 1979-2024): 830.7 mm

DCCEEW Streamflow Gauge

Prospect Creek at Smithfield Road (Station ID 213009) upstream of the study area and downstream of Prospect Reservoir (11/11/1987 to 6/7/2024)

Historical Event Validation

Detention and Drainage Upgrade Options Assessment





Water Quality Analysis

Nutrients, low dissolved oxygen, and heavy metal toxicants considered high threat to environment and water users for further investigation.

14x Gross Pollutant Trap System
3 x CDS units, 2 Ecosols, 4 x Trashracks, 2 x Humeceptors, 2 x Litter Booms, 1 x Sediment Sump

11x Bioretention Basin/Swale
The Crest, Chester Hill Raingarden, Bankstown SES, Iron Bark Estate Villawood, Bioswales through reserves

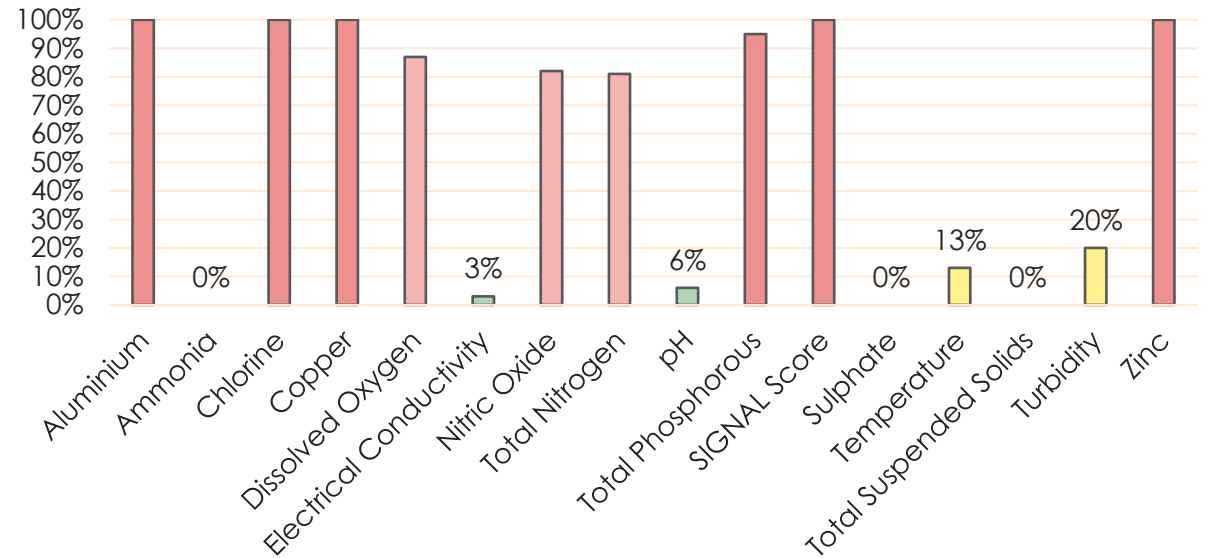
1x Sediment Basin/Swale
Amaroo Reserve

1x Stormwater Harvesting
The Crest Velodrome

3x Macrophyte Beds (in channel)
Christina Rd, Miller Rd, Orchard Rd

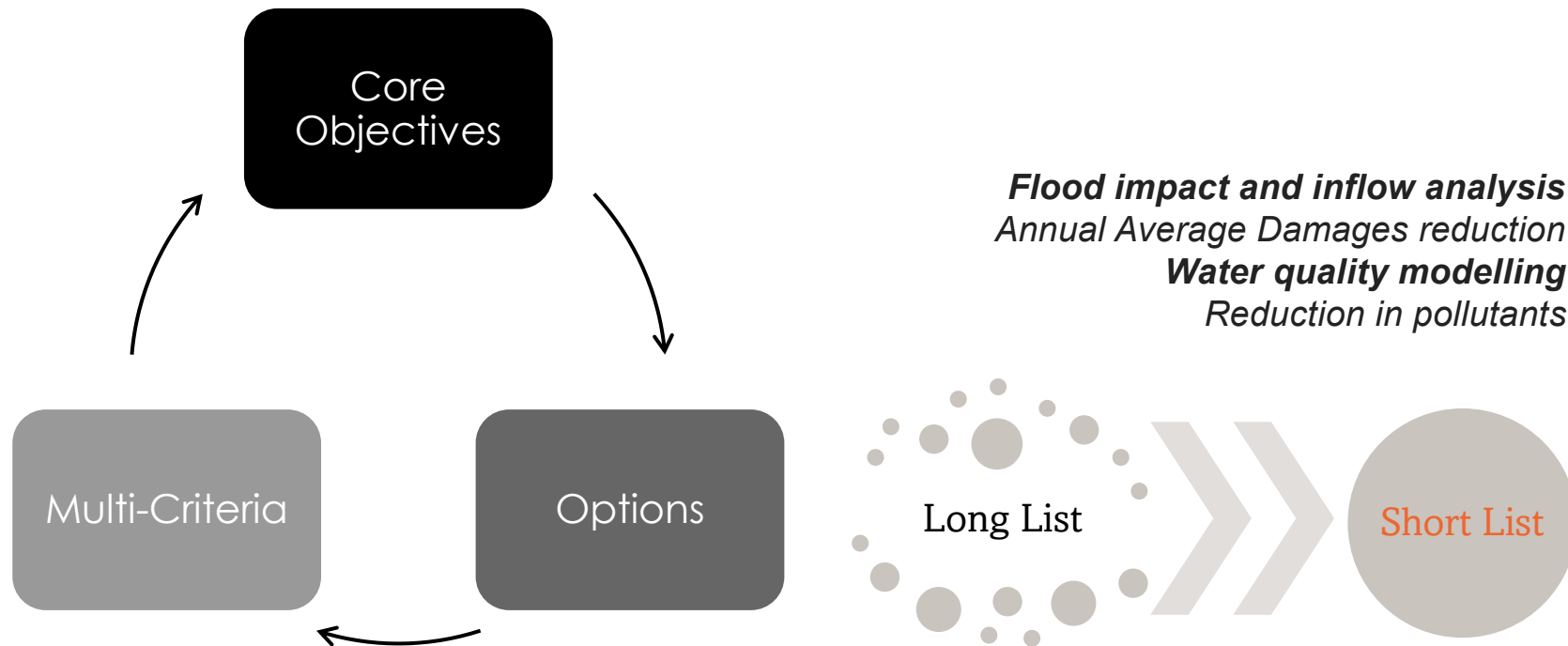
7x Wetland/Lake/Pond Systems
Lake Gillawarna (x2), Louisa Reserve, Lansdowne Reserve, Lake Mirambeena, The Crest Ponds (x2)

Lower Prospect Creek (Georges Riverkeeper)
Carramar pumping station (SP0214)(Sydney Water)



Loading (kg/ha/yr)		Villawood	Lansdowne	Miller Road	Georges Hall
Total Suspended Solids (TSS)	Source	935	638	762	733
	Residual	631	243	746	335
Total Phosphorus (TP)	Source	1.8	1.3	1.7	1.6
	Residual	1.6	0.8	1.7	1
Total Nitrogen (TN)	Source	13.5	9.3	13.9	11.2
	Residual	12.8	7.0	13.2	8.6
Gross Pollutants	Source	147	84	142	109
	Residual	54	6.5	81	16

Options Assessment





Multi-Criteria Assessment

There were nine (9) final criteria selected :

Economic

Social

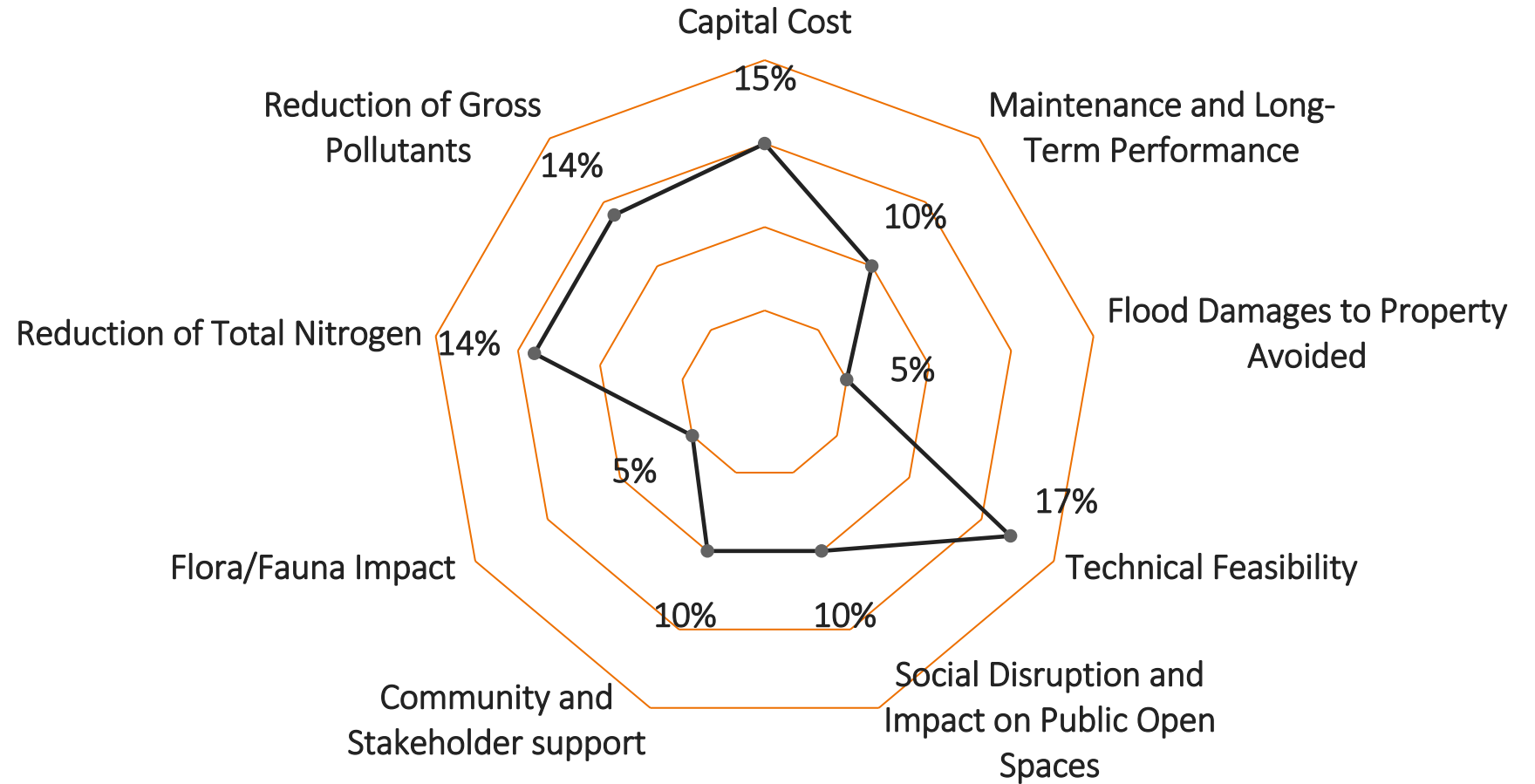
Environmental

Weightings determined through stakeholder consultation as shown.

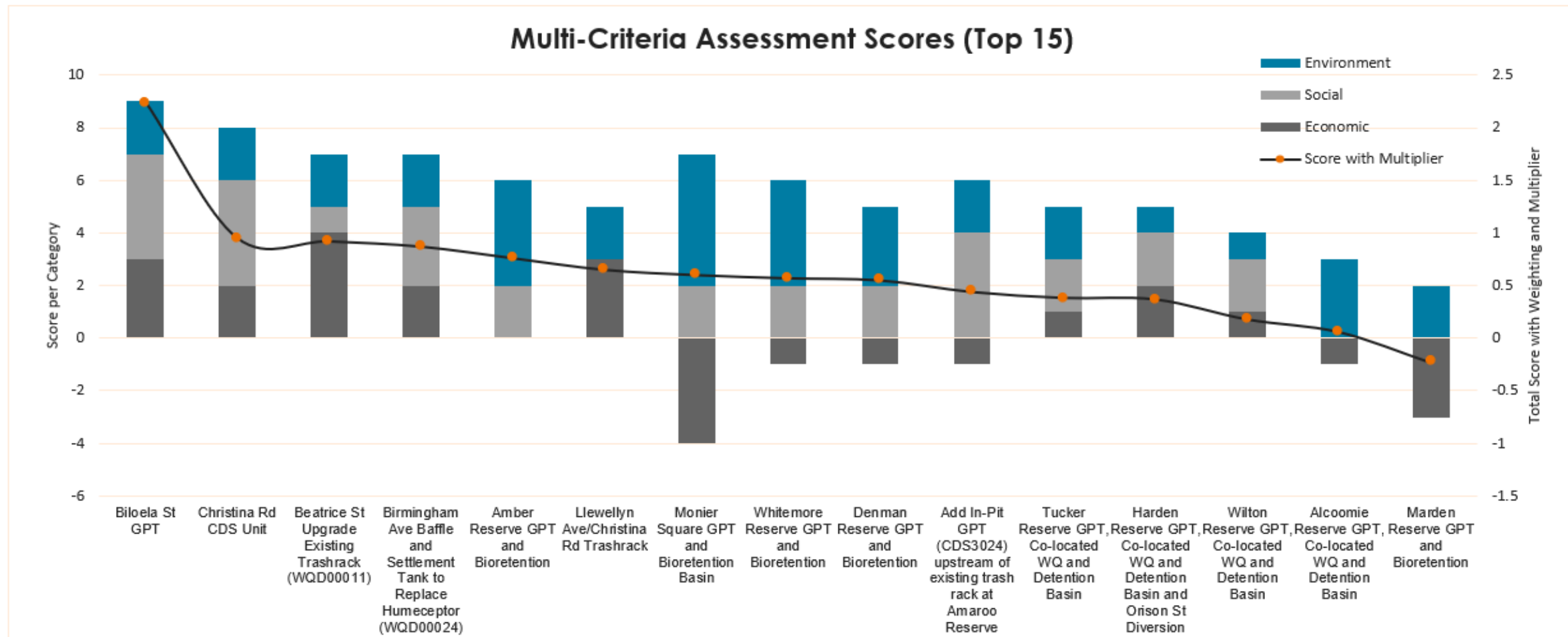
Scores applied within ranges of -2 (notable negative impact) to +2 (notable positive impact)

Environmental

Economic

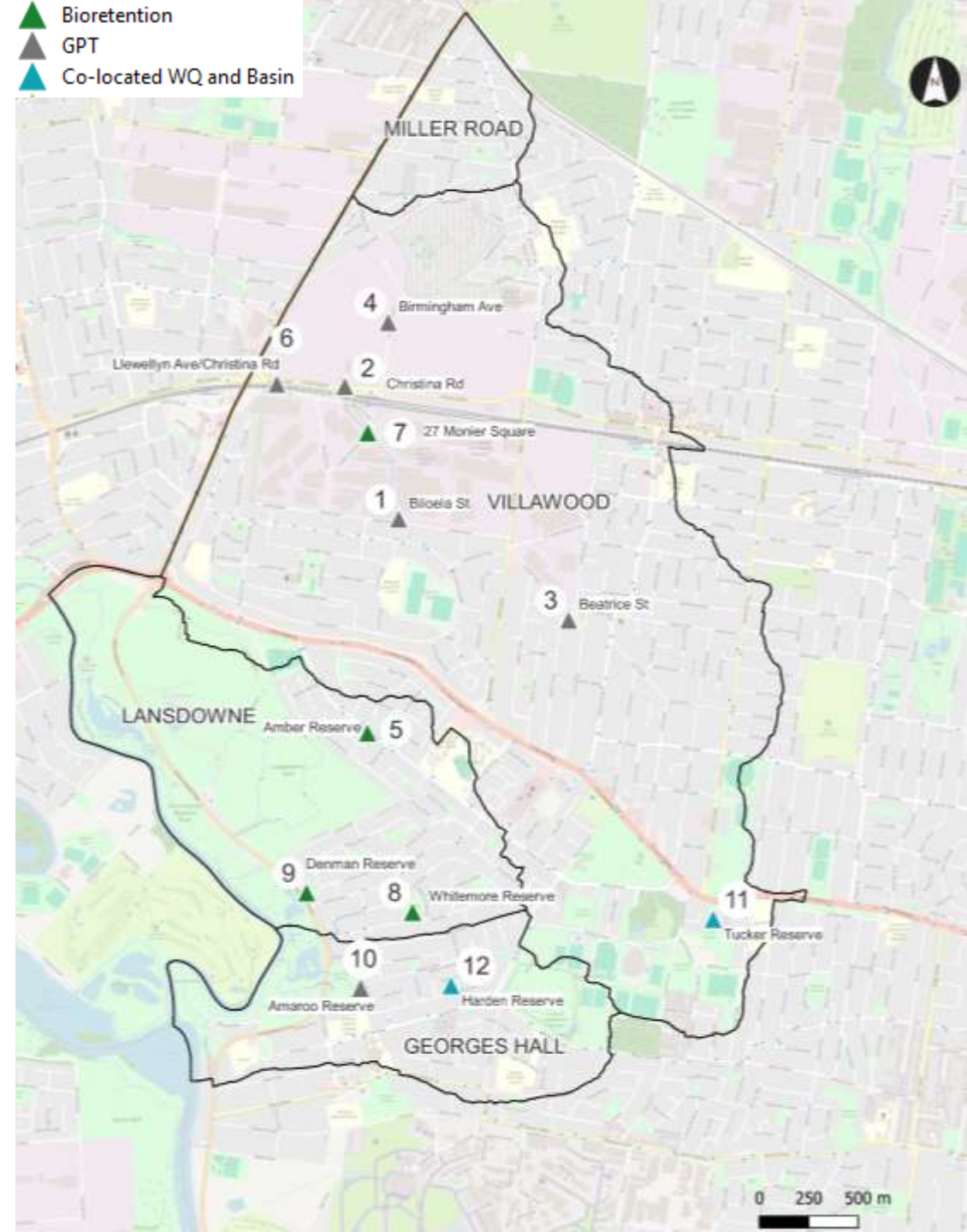


Social

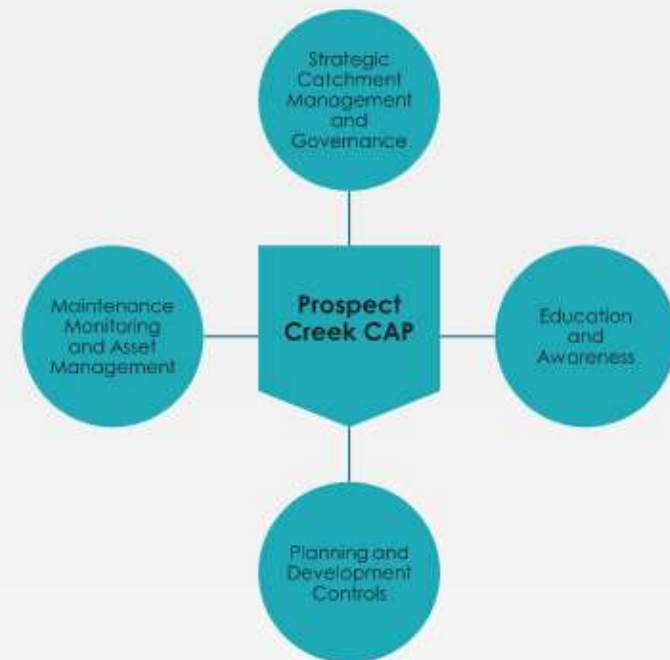


Short-listed Options

1	Biloela St GPT
2	Christina Rd CDS Unit
3	Beatrice St Upgrade Existing Trashrack (WQD00011)
4	Birmingham Ave Baffle and Settlement Tank to Replace Humeceptor (WQD00024)
5	Amber Reserve GPT and Bioretention
6	Llewellyn Ave/Christina Rd Trashrack
7	Monier Square GPT and Bioretention Basin
8	Whitemore Reserve GPT and Bioretention
9	Denman Reserve GPT and Bioretention
10	Add GPT upstream of existing trash rack at Amaroo Reserve
11	Tucker Reserve GPT, Co-located WQ and Detention Basin
12	Harden Reserve GPT, Co-located WQ and Detention Basin



Plan to Implement



Non-Structural Action Summary

Priority

**High
10x**

Actions that have been identified in multiple previous strategies, leverage integration of planning efforts and/or are tied to short-term actions that CBC is likely able to conduct within known funding frameworks.

**Medium
12x**

Actions that are likely to provide benefit over time but require additional development to confirm value comparative to financial outlay. Also includes recommended changes to planning documents for clarity as 'nice to haves.'

**High-Ongoing
16x**

As below with high priority to commence programs and begin laying groundwork to see outcomes over the next 10-year period (i.e. interventions for water quality improvement)

**Ongoing
16x**

Support ongoing programs and long-term collaborations that are likely to span multiple funding streams and require champions within respective organisations to see through over planning horizons extending beyond 10+ years

Structural Measure Summary

Planning Horizon

**Soon as Possible
Short Term**

CV2 Monier Square GPT and Bioretention Basin

CV6 Biloela St GPT

V25 Beatrice St Upgrade Existing Trashrack (WQD00011)

2025-28

CG6 Add GPT upstream of existing trash rack at Amaroo Reserve **(Leverage existing Asset Planning budget)**

CV3 Tucker Reserve GPT, Co-located WQ and Detention Basin **(As Priority 3 in the Flood Risk Management Study and Plan)**

CG2 Harden Reserve GPT, Co-located WQ and Detention Basin **(As Priority 1 in the Flood Risk Management Study and Plan)**

Medium Term

CV13 Birmingham Ave Baffle and Settlement Tank to Replace Humeceptor (WQD00024)

L5 Amber Reserve GPT and Bioretention

L8 Whitmore Reserve GPT and Bioretention **(Further Design Development)**

Long Term

L11 Denman Reserve GPT and Bioretention **(Further Design Development)**

Compare

CV9 Llewellyn Ave/Christina Rd Trashrack to CV6 Biloela St GPT **(Resolve to Only One Option in Short Term)**

V21 Christina Rd CDS Unit to CV2 Monier Square GPT and Bioretention Basin **(Resolve to Only One Option in Short Term)**

Plan to Implement

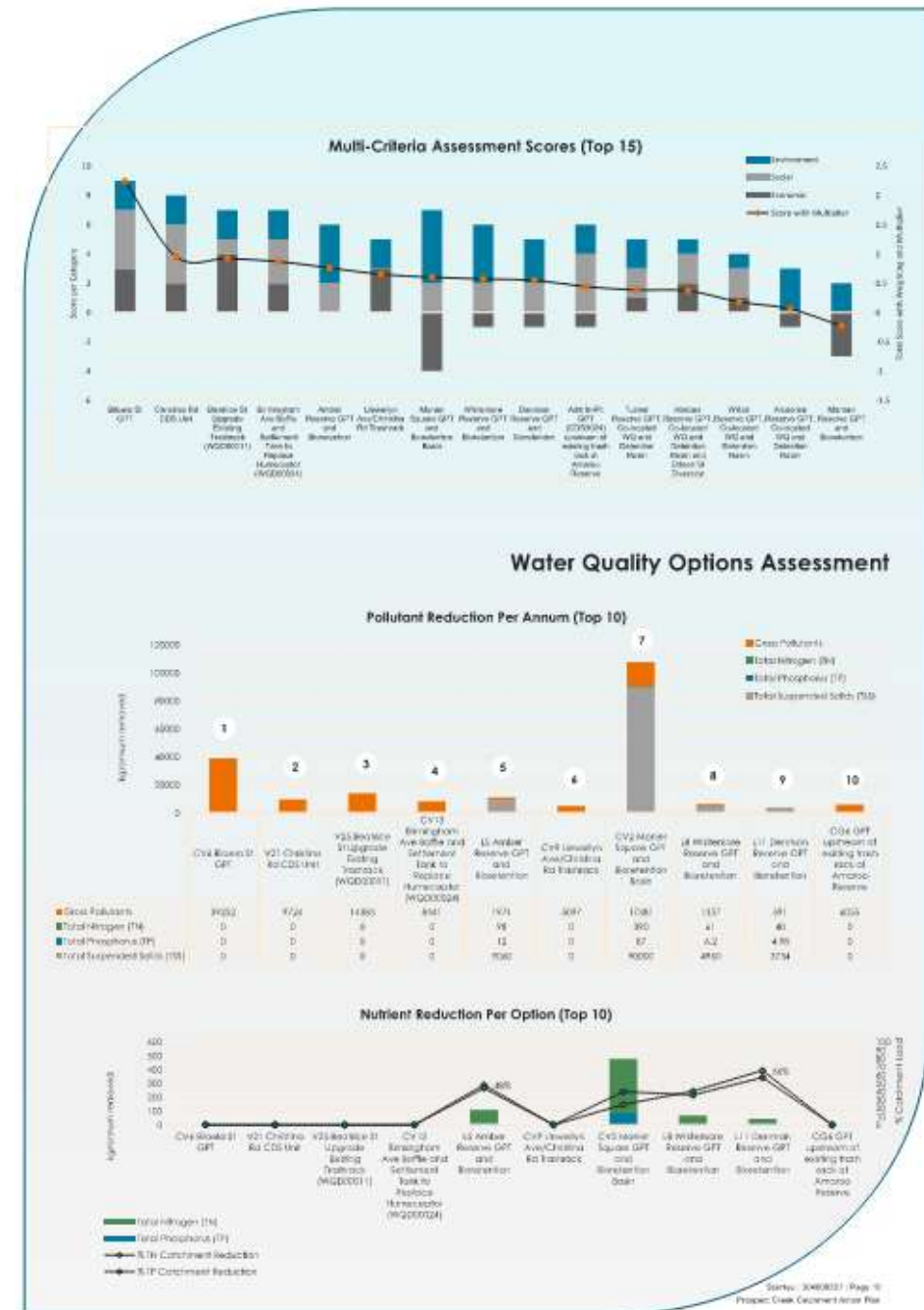
Category	Action ID	Action	Strategic Reference	Priority
Strategic Catchment Management and Governance	SG2	Investigate opportunity to collaborate with Fairfield City Council for Knight Park stormwater intervention <i>(Given no water quality measures were able to be recommended for Miller Rd)</i>	Georges River CMP Scoping Study (2022)	High
	SG3	Integrate between the Connective City 2036 Evolutions and the recently published Catchment and Waterways Strategic Plan (2024)	Connective City 2036	High
	SG8	Determine ownership of our creek and waterways assets, such as mangroves, in partnership with the relevant State Government agencies.	Catchment and Waterways Strategic Plan (2024)	High*
	SG16	Review and embed best practice use of herbicides, fertilisers and pesticides into CBC landscape maintenance plans and guidelines	Pollution Sources Scoping Study (2023)	High
	SG20	Support and review the Georges River Catchment Stormwater Management Targets Assessment application to the Prospect Creek Sub-catchments <i>(This will influence the uptake of Action PD1 and PD9 below)</i>	Georges River CMP Scoping Study (2022)	High
	SG27	Contribute to Sydney Water Urban Water Cycle Strategic Plan (due by July 2025)	Greater Sydney Water Strategy Action 3.1b	High
Planning and Development Controls	PD9	Review and update planning controls for circular economy principles, water conservation, sustainable water use, stormwater flow management, wastewater, pollution, sedimentation and water quality improvement devices.	Catchment and Waterways Strategic Plan (2024) Greater Sydney Water Strategy (2022) NSW Water Strategy 2050 (2021) WSUD Planning Provisions Review (2021)	High*
	PD1	Development Control Plan (DCP) WSUD Requirements with Botany Bay Water Quality Improvement Plan Targets <i>(Specific to development type and scale)</i>	WSUD Planning Provisions Review (2021) Catchment and Waterways Strategic Plan (2024)	High <i>High for investigation*</i>
	PD3	Establish a drainage scheme with an offset and developer contributions framework to manage and capitalise on any future redevelopment.	WSUD Planning Provisions Review (2021) Catchment and Waterways Strategic Plan (2024)	High*
Maintenance, Monitoring and Asset Management	MM10	Support potential updates to the Georges Riverkeeper Report Card Program	Pollution Sources Scoping Study (2023) Catchment and Waterways Strategic Plan (2024)	High*

Plan to Implement

Category	Action ID	Action	Priority
Strategic Catchment Management and Governance	SG4	Advance the Connective City 2036 Blue and Green Web Evolutions to meet 2036 indicators	High-Ongoing
	SG11	Improve the water quality rating for aquatic flora and fauna habitats from D-F grade to B-C grade by 2036.	High-Ongoing
	SG19	Support and provide input to the Georges River Catchment Water Quality Data Compilation, Review and Analysis Report. <i>(To be undertaken in conjunction with Action MM5: Expanded and refined water quality monitoring program)</i>	High - Ongoing
	SG21	Support the Georges River Sub-catchment Prioritisation Study to evaluate the Prospect Creek Sub-catchment against other LGA catchments	High - Ongoing
Maintenance, Monitoring and Asset Management	MM1	Expand and refine the litter removal program, including investigation of applicable EPA litter data and monitoring tools	High - Ongoing
	MM2	Expand and refine the weed and pest control program	High* - Ongoing
	MM3	Expand and refine the sediment and erosion control program <i>(additional information in Section 5.6)</i>	High* - Ongoing
	MM4	Urban Heat Island Effect (UHI) intervention and native revegetation <i>(includes supporting Sydney Water for channel naturalisation opportunities and development of an Action Plan)</i>	High* - Ongoing
	MM5	Expanded and refined water quality monitoring program <i>(additional information in Section 5.5)</i>	High* - Ongoing
	MM6	Refined Stormwater Maintenance, Condition Assessment and Audit Program <i>(includes ongoing waterway condition assessments, catchment-specific streetsweeper data and GPT litter-specific data collection)</i>	High* - Ongoing*
	MM7	Expanded and refined Asset Database <i>(include water bodies, natural water resources, stormwater harvesting, all WSUD measures and private assets with combined condition and inspection data)</i>	High - Ongoing
	MM8	Engage a full-time environmental compliance officer in CBC compliance team. <i>(the role could focus on regulating the conduct of construction activities across the CBC LGA)</i>	High*-Ongoing
	MM9	Invest in fine particle removing street sweepers with catchment-specific metrics and targeted scheduling for stormwater pollutants	High*-Ongoing
Education and Awareness	MM11	Explore opportunities to partner with First Nations Land Care Providers for Maintenance Activities	High - Ongoing
	EA5	Continue to support the 'Get the Site Right' education campaign targeted at Building and Construction industry on the implementation of sediment and water management controls during construction.	High - Ongoing
	EA6	Targeted Commercial and Industrial User Consultation	High - Ongoing

Final Recommendations

- Implement non-structural and structural options based on recommended timeframe for implementation
- Review Asset Planning (AP) Stormwater budget to support implementation and identify funding pathways through ongoing partnerships
- Additional investigation and coordination for:
 - Opportunistic Streetscaping/WSUD and Channel Rejuvenation
 - Stormwater and Rainwater Harvesting
- Continue collaboration with the Georges Riverkeeper and DCCEEW for catchment-specific monitoring programs
 - Assess potential for unintentional accumulation of emerging and typical profiled contaminants in nature-based solutions



Sediment and Erosion Control

The key management actions identified in this CAP are emphasised as including but not limited to:

Action EA5: Continue to support the 'Get the Site Right' education campaign targeted at Building and Construction industry on the implementation of sediment and water management controls during construction.

Action SG16: Review and embed best practice use of herbicides, fertilisers and pesticides into CBC landscape maintenance plans and guidelines

Action PD1: Development Control Plan (DCP) WSUD Requirements with Botany Bay Water Quality Improvement Plan Targets

Action PD4: Updated Mapping of Waterways and Riparian Land for Local Environmental Plan (LEP)

Action PD5: Development Control Plan (DCP) Waterways and Riparian Land Requirements

Action PD8: Improve Council's Integrated Management System (IMS) to control the use of chemicals near waterways.

Action PD9: Review and update planning controls for circular economy principles, water conservation, sustainable water use, stormwater flow management, wastewater, pollution, sedimentation and water quality improvement devices.

Action MM1: Expand and refine the litter removal program, including investigation of applicable EPA litter data and monitoring tools

Action MM3: Expand and refine the sediment and erosion control program

Action MM5: Expanded and refined water quality monitoring program

Action MM6: Refined Stormwater Maintenance, Condition Assessment and Audit Program

- includes ongoing waterway condition assessments, catchment-specific streetsweeper data and GPT litter-specific data collection

Action MM7: Expanded and refined Asset Database

- include water bodies, natural water resources, stormwater harvesting, all WSUD measures and private assets with combined condition and inspection data

Action MM8: Engage a full-time environmental compliance officer in CBC compliance team

Action MM9: Invest in fine particle removing street sweepers with catchment-specific metrics and targeted scheduling for stormwater pollutants

Key Messages

- Importance of building on foundational studies and establishing a hierarchical, yet collective textual and graphic language of goals, priorities, actions, and indicators
- Community consultation and site visits are necessary for holistic catchment planning, but to be used wisely
- Always be connecting the dots and carrying through key concepts
- Maximise the available data but consider statistical significance – use engineering judgement to apply conclusions and support further studies
- Leverage scoring metrics, but use wisdom in applying the results
- Leverage graphics and summary scorecards



Thank you

