

Calgary Metropolitan Region Board

Water Roadmap update: Recommended areas of focus

Final summary report

11 January 2024

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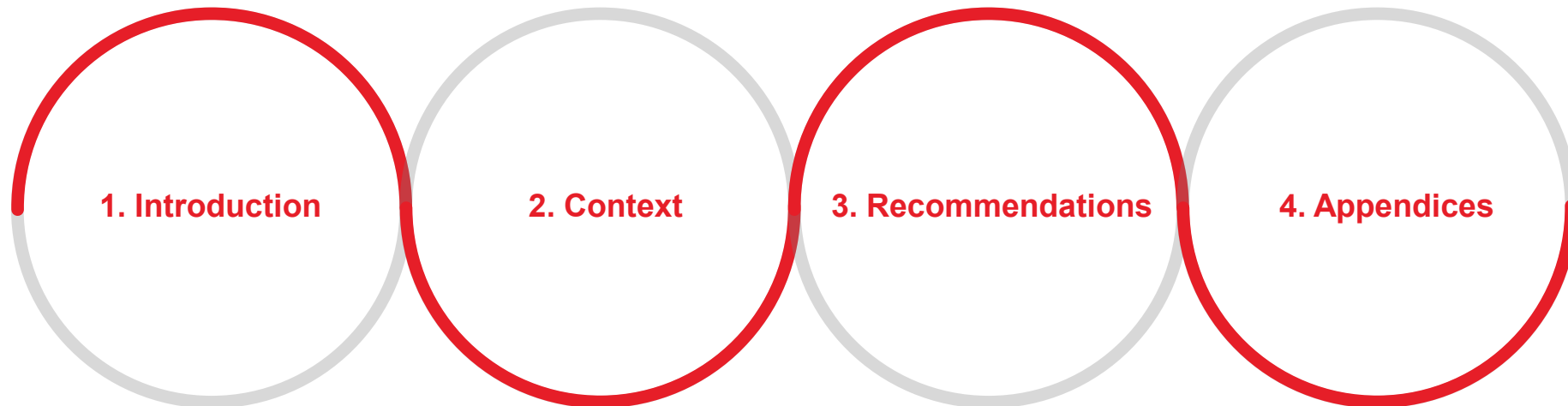
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1. Introduction

Focus and structure of this document

This is the final report for the Calgary Metropolitan Region Board project to scope the update to the Water Roadmap and provide areas of focus for the long-term water strategy. This report contains 4 main sections, as outlined below.



We provide the project purpose and objectives, and the approach and methodology. We detail the focus and structure of the document, as well as reflections and observations obtained during the desktop research, interviews and water Technical Advisory Groups (TAGs).

We detail the relevant physical, institutional and policy context of the CMR, and background to the Board mandate. We point to the CMRB Growth Plan as key guidance for growth in the region, and the OurWater Tool and Policy Context as key outputs to understand the region and support recommendations.

We describe the prioritization framework used to make our recommendations and present our recommendations. We provide an overview, followed by a detailed slide describing each of them. We provide a conceptual timeline for implementation.

We include additional detail in a technical appendix for interested readers. Sections include: the OurWater Tool, policy hierarchy summary, stakeholder engagement feedback, case studies to support recommendations, and a summary of water-related policy in the CMRB Growth and Servicing plans.

1. Introduction

Project context and purpose

Project context

The Calgary Metropolitan Regional Board (CMRB) is a not-for-profit, provincially mandated corporation established in 2018 in response to challenges related to rapid growth in the Calgary Metropolitan Region (CMR). Their focus is to support long-term sustainability in the region by 1) ensuring responsible land-use planning and growth management 2) developing policies regarding the coordination of regional infrastructure investment and service delivery, 3) promoting economic wellbeing and 4) developing policies outlining engagement with the public.

CMRB's Growth Plan and Servicing Plan, approved and filed by the Minister, respectively, provide policies and high-level guidance to municipalities and establish preferred growth areas. Both documents have a strong focus on water, addressing matters of water stewardship, flooding, stormwater management, water and wastewater servicing and long-term water planning.

The Water Table roadmap was a key document produced by CMRB in 2019 to support development of the Growth and Servicing plan. It identifies key areas of work for the water sector and a high-level program for their completion. The CMRB is currently in the process of updating this roadmap with the purpose of developing clear, vetted objectives for future long-term strategy for water security in the region, which align with the values of the Growth Plan and Servicing Plan.

Project purpose

CMRB asked Arup to support the scoping of the updated Water Roadmap by recommending key areas of focus and prioritisation, identifying both quick wins and longer-term actions and highlighting where the CMRB should focus their effort in efficiently and effectively fulfilling its regional role. In support of this exercise Arup was asked to apply its City Water Resilience Approach (CWRA) approach, and specifically to leverage its OurWater tool.

Specific project charter objectives

1. Provide an overview of previous work, direction from Growth and Servicing Plans, current understanding, other external initiatives to inform development of areas of focus discussions and gap analysis
2. Confirm areas of focus for water where the CMRB can create benefit to its members with its work through a collaborative process
3. Gap analysis
4. Identify ways that CMR can fulfil its regional role, and prioritize regional initiatives related to water management in CMR

1. Introduction

Project methodology



First, we completed a desktop review of existing studies, projects and policies relevant to the region. We created a repository of documents that provides a comprehensive overview of the work to date.

This review fed into the development of two outputs;

- OurWater map
- Legislation/policy overview

For more detail of each of these outputs, please see *Appendices 1 and 2*.

We held semi structured interviews with 10 local stakeholders. Interviewees included members from the provincial government, Watershed Planning and Advisory Councils (WPAC), Watershed Stewardship Groups (WSG), water utilities, industry and an irrigation district.

Deeper understanding of local challenges, actions and opportunities was obtained through the interviews. This was used to refine outputs produced in the previous stage and inform our recommendations.

For a list of interviewees conducted and overarching findings see *Appendix 3*.

The Arup delivery team met regularly with the Water TAG to present progress and obtain feedback and municipal input when developing these recommendations.

The four Water TAG meetings included an introductory session, a workshop on the draft outputs of the desktop review (including of the OurWater tool and legislation/policy review), draft recommendations presentation, and a session to discuss Water TAG feedback.

Having reviewed all existing documentation, spoken to local stakeholders as well as municipal authorities, and consulted with internal and external expertise, we developed a set of 6 recommendations for the CMRB Water Table Roadmap Update.

The recommendations aim to address most pressing issues of the region, consider the Board remit and aim to leverage the foundations of existing, comprehensive work in the region.

1. Introduction

Overarching Observations

- The **CMRB Growth Plan and Servicing Plan set strong precedence** in terms of collaboration and policy - including through its most fundamental element of identifying Preferred Growth Areas; and for example through the 1:200 flood protection measures for greenfield developments – which is a concrete policy initiative that leads the way in moving beyond provincial policy.
 - The CMRB Growth Plan and Servicing Plan have a very strong, positive and strategic focus on water, and **stakeholder engagement for this project validated that the plans reflect what stakeholders care about.**
 - The plans incorporate **or accommodate at a high-level the findings and recommendations** that emerged from the prior water-related complexity studies (which were designed to inform the Growth and Servicing Plans). In doing so, the GP and SP did not make any concrete recommendations for targeted focus and/or prioritisation.
 - The roadmap to-date has also focused on **identifying and understanding the issues and challenges of the region**, and commissioning the reports necessary to inform the CMRBs work. It has not set out any concrete guidelines for targeted prioritisation.
 - It is clear that the updated roadmap should focus CMRB's work in on areas where it can most **efficiently, effectively and concretely support progress** towards regional water security and sustainability objectives. This is what the project charter mandated in the first place, but this sense of a need to move further from analysis to action-oriented implementation has been tangible from our interactions. Otherwise there is a risk of the CMRB getting stuck in analysis-paralysis. As such, any need for further study and investigation needs to be accompanied by a focus on concrete action.
 - There is deep **knowledge and expertise** within the CMRB executive and the CMRB member municipalities on water-related issues. Similarly there is a huge amount of knowledge, expertise and passion across the breadth of stakeholders in the region.
 - The CMRB is clearly **well-connected** across most of these stakeholders, and we felt a strong sense of positive recognition of and support for what the CMRB and is trying to achieve.
- All of this provides a very strong foundation for scoping out the next iteration of the water roadmap -- with a focus on concrete action.**

1. Introduction

Strong water focus within the Growth Plan and Servicing Plan

Water is a central focus of the CMRB's Growth Plan and Servicing Plan, with the former recognising that *'water is essential to the success and quality of life in the Region'*. The plans articulate the approach to accommodate one million more people while enjoying and protecting the natural environment, and using precious water resources wisely.

- **The Growth Plan** refers to the water environment in two main areas: **Section 3.3 Protect and Enjoy the Environment** (policies around flood management, environmentally sensitive (aquatic) areas, and climate change), and **Section 3.4 Water Stewardship**, which focuses on watershed protection, stormwater management, water efficiency and collaboration and governance (for sub-regional water management and conservation).
- **The Servicing Plan** outlines the **Long-Term Water Strategy** as a key focus for the region, citing watershed planning (which includes watershed protection, water quality and water quantity), water-use efficiency, and advocacy (with the Province on water related matters) as the three top region-wide priorities. **Chapter 5 Water and Wastewater Servicing** and **Chapter 6 Stormwater Management** are also relevant here, specifically collaboration of servicing for the former and stormwater reuse for the latter.



Growth Plan

EFFECTIVE AUGUST 15, 2022



Servicing Plan

A clear direction of travel

The water focus in the Growth Plan and Servicing Plan, and the findings from the stakeholder engagement, are mutually re-affirming and provide a clear direction of travel for the Water Roadmap. We set out a number of concrete, proactive and actionable recommendations both in terms of process and policy focus.

2. Context

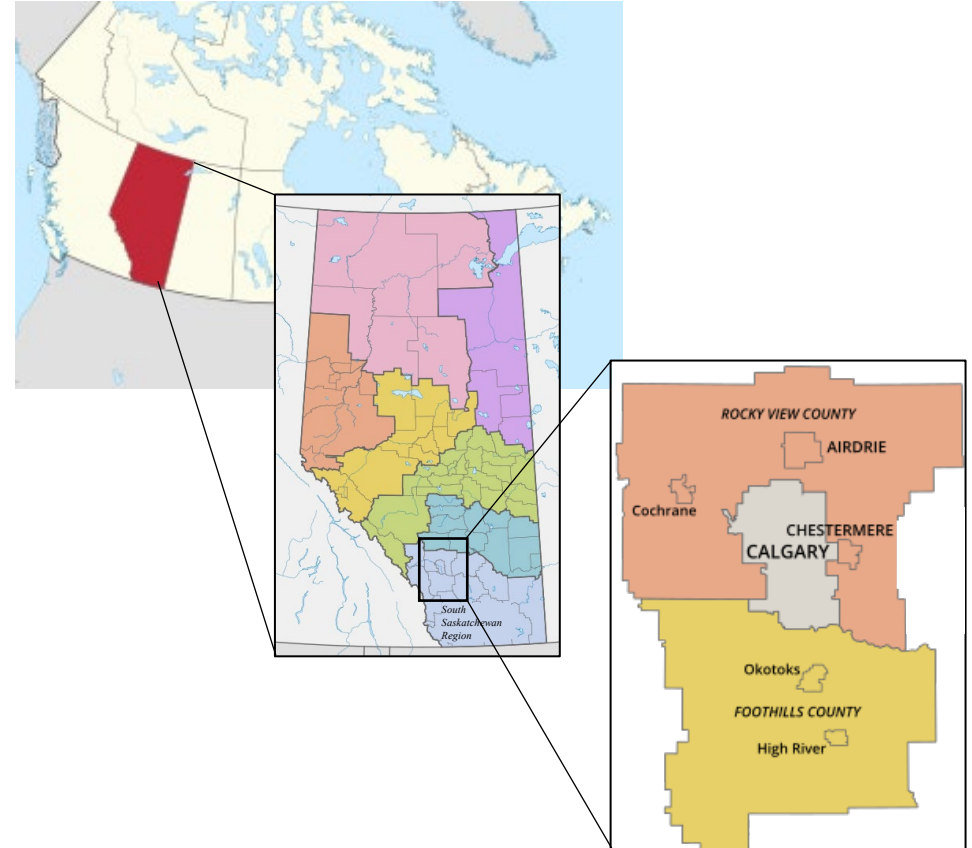
The Calgary Metropolitan Region (CMR)

The Calgary Metropolitan Region (CMR) is located in the South Saskatchewan Region in Alberta, Canada. Around two million people live in the South Saskatchewan Region, with **1.6 million (80%) in the CMR**. Alberta is currently experiencing significant population growth, and the **CMR is expected to increase by 1 million people in the next 30 years**.

As well as population growth, the **CMR economy has experienced significant expansion over the past decade**, at times leading the nation in growth. This growth has been driven in large part by the energy sector, although swings in energy prices have also resulted in downturns. **Strides have been made in diversifying the regional economy**. Over the past 30 years, the finance, insurance and real estate and transportation and warehousing sectors have doubled their share of total activity, and manufacturing, construction and professional scientific and technical services sectors have also experienced significant growth.

Around 85% of the population of CMR live in **urban centres**, with most based in the City of Calgary. The remainder live in **rural, largely agricultural areas**. The CMR is located in the **traditional territory** of the Siksika, Kainai, and Piikani Nations of the Blackfoot Confederacy; the Tsuut'ina Nation; the Bearspaw, Chiniki, and Goodstoney Nations of the Stoney Nakoda; and the Métis Nation of Alberta Region 3.

The region is **being impacted by climate change**. The mean provincial temperature has increased by 1.4°C, largely since the 1970s. From 1 to 15 May 2023, heat records were broken in Alberta 158 times. Higher temperatures combined with less rainfall increase the frequency and intensity of forest fires, evidenced this year with Alberta's state of emergency between May and June.



Location of the CMR within the South Saskatchewan Region, in Alberta, Canada

2. Context

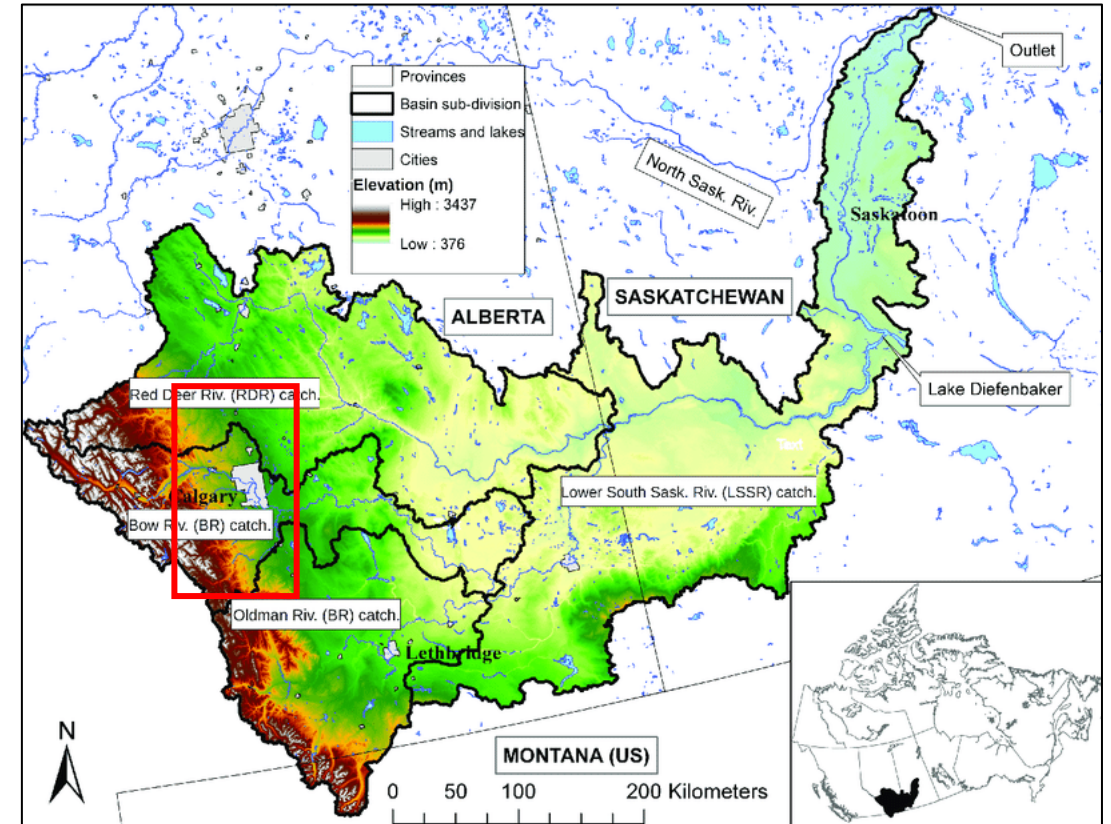
Water in the CMR: underlying hydrology

The **South Saskatchewan River basin (SSRB)** is one of the largest river basins in Western Canada, and one of the most significant for the country, producing 80% of Canada's agricultural crops. There are three SSRB sub-basins located in the CMR: the Red Deer, Oldman and Bow river basins (see the red box on the map alongside). Basin headwaters are in the Rocky Mountains, and water flows north-east through Alberta and Saskatchewan before draining into Lake Winnipeg, Manitoba.

The SSRB area contains **three ecozones**: the Prairies, the Boreal Plains, and the Montane Cordillera. The majority ecozone in the CMR are Prairie areas, characterised by flat grassland, with a climate that ranges from semiarid to sub-humid. This means very cold winters, moderate summers, and low levels of precipitation.

One third of all precipitation in the basin falls as snow, with snow build up during fall and winter melting during spring and early summer (snowmelt) to provide the majority of river flow. Glacial meltwater is important in the late summer, while in winter, groundwater contributes 20% of the Bow River flow volume.

The Bow, Oldman and South Saskatchewan sub-basins have been **closed to new licenses since 2006** (see the South Saskatchewan River Basin Water Management Plan). Warmer air temperatures, changes in precipitation, retreating glaciers, and greater frequencies of extreme events will affect water quality and quantity in the CMR. Specifically, reductions in the snowpack and earlier onset of snowmelt is expected to **decrease overall river flows in an already constrained basin**.



The South Saskatchewan River Basin: *Red Deer River, Bow River, Oldman River, and Lower South Saskatchewan River sub-basins*. CMR highlighted in a red box. Source: Morales-Marin et al, 2018

2. Context

Water in the CMR

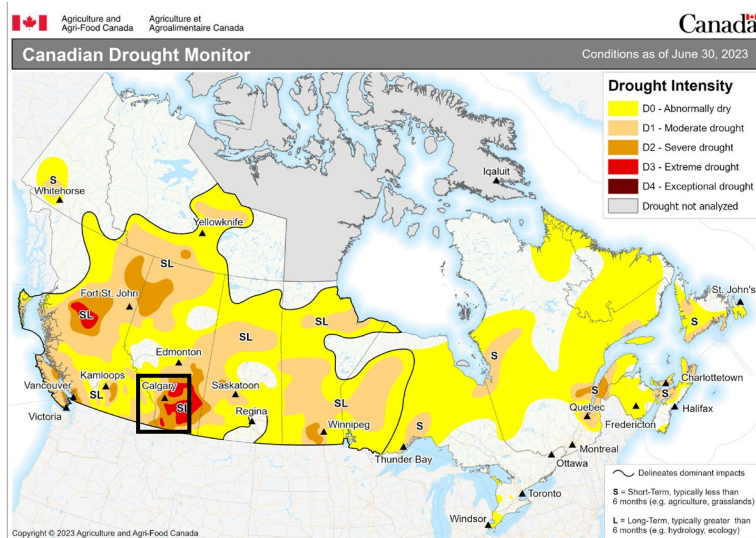
There are a number of water challenges in the CMR, including what are growing global challenges around ‘too much water’ and ‘too little water’.

Too little water

Water availability is a pressing issue as this work develops, as the region battles drought conditions. In June 2023, 60% of the country was classified as Abnormally Dry (D0) or in Moderate to Extreme Drought (D1 to D3), **and 83% of the Prairie Region (including Alberta) was classified as Abnormally Dry (D0) or in Moderate to Extreme Drought (D1 to D3)**, including 90% of the region’s agricultural landscape. The south-eastern corner of the province had received less than 40 per cent of typical rainfall this season. As of July 2023, water shortage advisories have been issued for 28 water management areas in the province, in line with the Government’s staged drought response plan.

Too much water

Significant floods in 1995, 2005, and 2013 **highlighted the diverse hydrological conditions experienced in the region**, and the need to be resilient and adaptable in responding to a wide range of future climate events and impacts. **In June 2013, over 200 millimetres of rain fell in just two days:** the Elbow River began flowing 12 to 15 times faster than usual, and the Bow River raged up to eight times its normal rate. Thirty-two communities in the region declared states of emergency, including the City of Calgary. Sadly, five people lost their lives, and southern Alberta experienced approximately \$6bn of financial losses and property damage.



Canadian Drought Monitor showing severe to extreme drought in the area of the CMR (June 2023).



Photo of Calgary City inundated during the 2013 floods.

2. Context

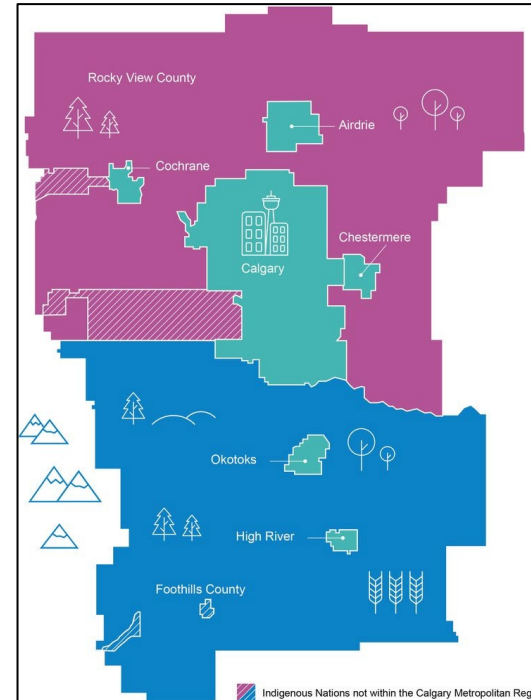
The Calgary Metropolitan Region Board (CMRB)

Established in 2018, the CMRB is a not-for-profit government corporation made up of elected officials from the Calgary Metropolitan Region's 8 member municipalities: City of Airdrie, City of Calgary, City of Chestermere, Town of Cochrane, Foothills County, Town of High River, Town of Okotoks, and Rocky View County.

The CMRB is committed to supporting the long-term social, environmental and economic wellbeing of the Calgary Metropolitan Region by facilitating collaborative regional planning practices, optimizing shared services and land use, and fostering sustainable growth. The vision of the CMRB is included on the right. As required by the CMRB regulation, two key documents have been jointly produced by CMRB members to support this vision:

- the Growth Plan (2022), and
- the Servicing Plan (2022).

The draft Water Table Roadmap (2019) is the basis for this project and was an input into the 2022 Growth and Servicing Plans. The 2019 roadmap focuses on understanding and defining challenges, and providing recommendations on servicing approaches.



CMRB vision:

“Building on thousands of years of history, we welcome everyone to join us in living happy, healthy and prosperous lives in a spectacular natural environment.

We are a world leading region built on hard work, resilience, helping others and a deep respect for nature.

We use our land wisely, share our services and care for our wildlife, air and water.

We grow together.”

The Calgary Metropolitan Region Board municipalities: Rocky View County (purple), Foothills County (blue), Cities of Airdrie, Calgary, Chestermere and Towns of Cochrane, High River and Okotoks (teal). Alongside, the vision of the CMRB.

2. Context

The CMRB Growth and Servicing Plans

The Growth Plan and Servicing Plan for the Calgary Metropolitan Region were approved and filed by the Minister, respectively, and came into effect in 2022. The plans set policy to support long-term prosperity in the Calgary Metropolitan Region, providing policies and high-level guidance to municipalities on regionally significant topics including:

- Residential, commercial and industrial land use
- Corridors for transportation, recreation, energy transmission, utilities and transit
- Infrastructure planning and development
- Water quality, water use and management (including flood mitigation)
- Environmental sustainability and the conservation of agricultural lands

The Growth Plan provides a blueprint for growth by naming Preferred Placetypes, which include: infill and redevelopment, masterplan communities, and mixed-use/ transit-oriented development. The principles of the Growth Plan are to:

- Promote the integration and efficient use of Regional Infrastructure;
- Protect water quality and promote water conservation; and
- Encourage efficient growth and strong and sustainable communities.

For more information, see *Appendix 5 - detail of growth and servicing plans*

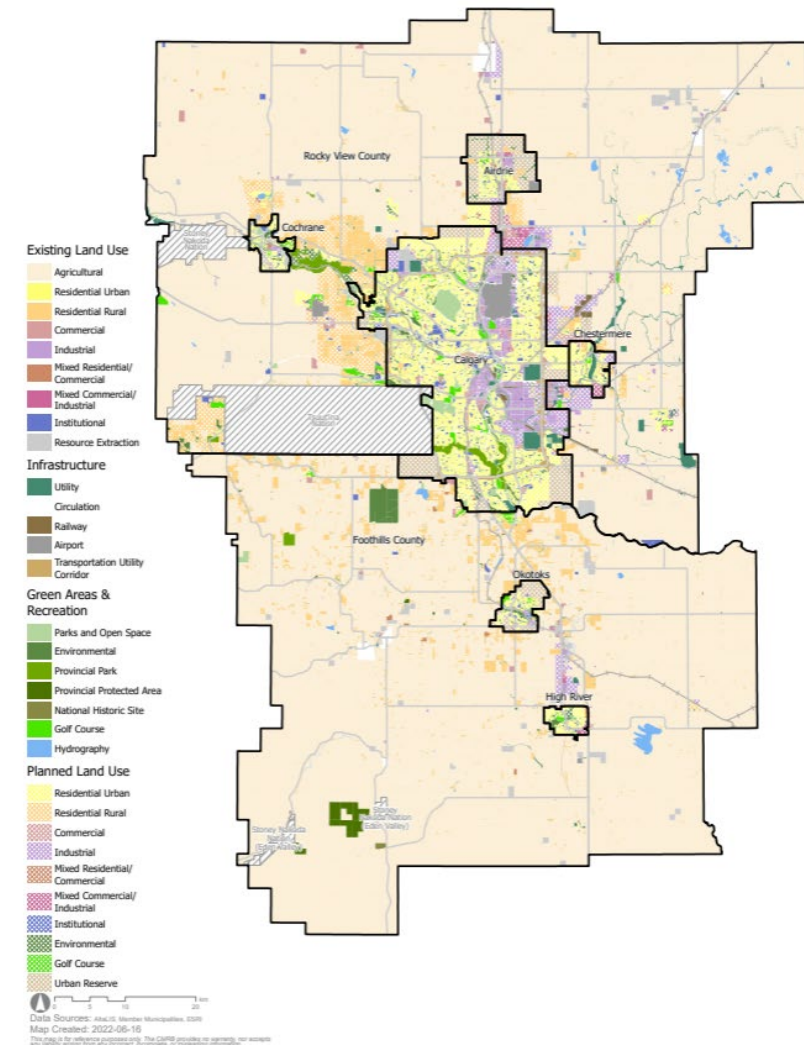


Figure 5: Approved and Planned Land (as of January 1, 2018)

Digitized Existing and Approved Land Use data prepared by ISL Engineering and Land Services in 2020 on behalf of the CMRB using 2018 parcel data provided by AltaLIS and the City of Calgary and 2018 land use data provided by CMRB member municipalities.

2. Context

Water cycle and stakeholders

OurWater is an online tool that aims to improve water governance through coordination and knowledge sharing. This is achieved by depicting water flow, assignment of stakeholders and collection of existing documents. It is a comprehensive and accessible place for visualization of the water cycle.

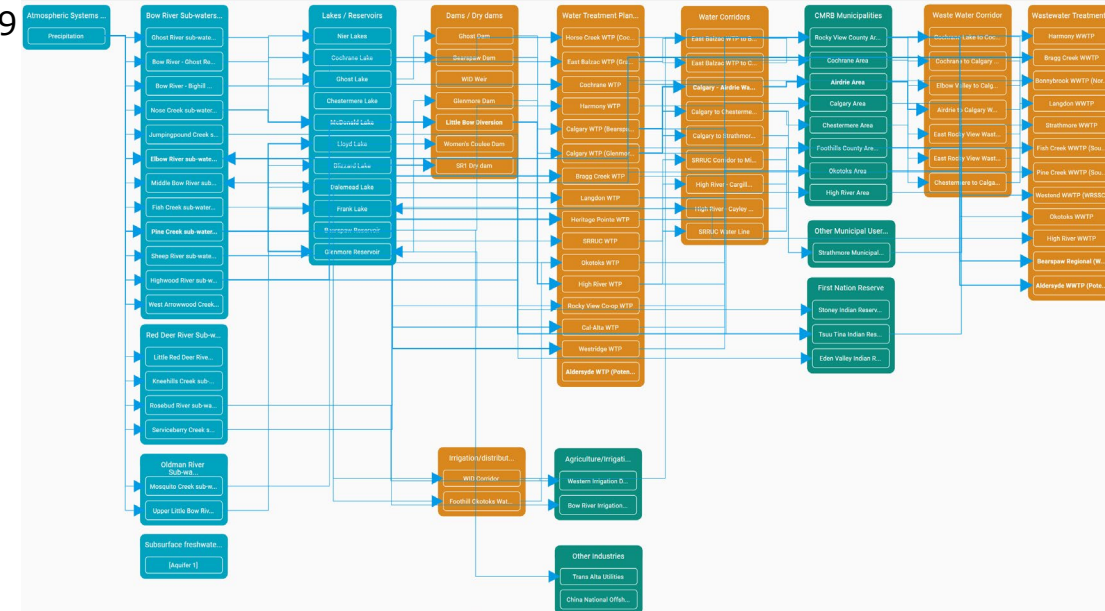
The CMR OurWater is constructed using extensive documentation obtained in the desk research, including geographical and infrastructural maps, servicing agreements and capacity studies. Key components of the CMR water cycle include

- **Natural assets:** consist of sub watersheds as set by the Hydrologic Unit Code 8 as well as lakes and reservoirs
- **Physical assets:** consist of dams, water treatment plants, water corridors, wastewater corridors and wastewater treatment plants. These were obtained predominantly from the 2019 CMR Existing Water & Wastewater Servicing & Regional Potential Study
- **Users:** consist of the CMRB Municipalities, First Nations, agriculture and irrigation and other industries. This was agreed with the CMRB administration to reflect the granularity and lens this work is addressing

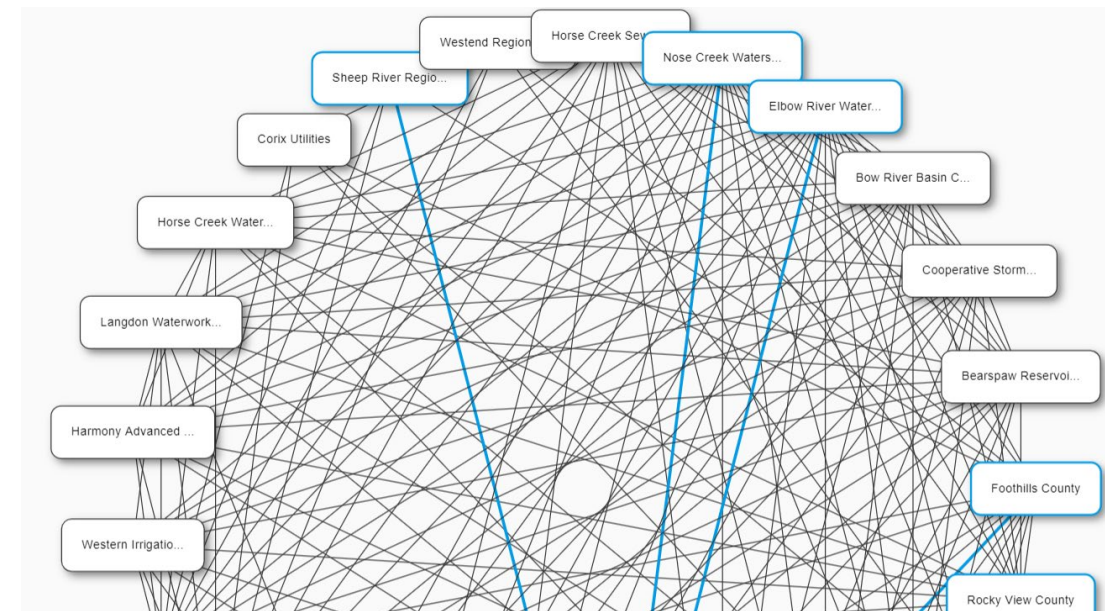
Stakeholders relevant to each asset in roles such ownership, management or regulation are assigned. A view of key **shocks and stressors** for the region is provided, namely pressures of water availability, declining water quality, surface water flooding and storm water management.

A comprehensive list of existing studies, plans, policies and programs is included and acts as a live repository.

Please see Appendix 1 for a detail description of CMR OurWater and the evidence base used to construct it.



Overview of CMR OurWater (Water cycle). Blue boxes represent natural assets, orange physical assets and green users.



Overview of CMR OurWater (Stakeholders)

2. Context

Policy context

As well as the physical assets, stakeholders, and shocks and stressors examined in OurWater, we have mapped the CMR's legislative and policy context. The resulting diagram is aligned to the policies and plans held in Our Water and compliments the tool by adding granularity to stakeholder relationships. We have considered four levels of policy and planning:

Federal

Water governance in the CMR aligns with Canadian federal law. This includes **federal and international agreements** on water use, with other entities such as the **United States** (Boundary Waters Treaty, 1909), **neighbouring provinces** (Master Agreement on Apportionment, 1969), and **Indigenous First Nations** in the area (Treaty 7 and First Nations principles).

Provincial

The Alberta **Water Act** is the primary legislation that guides water management decisions in the region. Policy-making and regulation is led by the province through the **Ministry of the Environment and Protected Areas (EPA)**, and guided by **Water for Life**, a strategy document that set out the Province's goals and key directions. This work is supported by the advisory group the **Alberta Water Council**.

Regional

The **CMRB** has a mandate to support sustainable growth in the region, largely through environmentally responsible land-use planning, coordination and

implementing the Growth Plan and Servicing Plan. At the watershed level, **Watershed Planning and Advisory Councils (WPACs)** and **Watershed Stewardship Groups (WSGs)** report on watershed health and facilitate collaborative planning, education and stewardship. WPACs are designated by the province to engage representatives of key stakeholder groups, including municipalities, and seek consensus on land and water management strategies. WSGs are community-based partnerships, supported by WPACs and municipalities, and typically convene to respond to specific, localised challenges.

Municipal and local

Municipalities produce management and design policies (incl source water protection, stormwater use), and development plans in line with the Water Act, using evidence and inputs from WPAC reporting. **Developers** produce master drainage and local area plans for municipal approval. We have not examined the municipal and local level in detail in the policy context, as the Roadmap Update is focused on provincial and regional policy and the role of the CMRB.

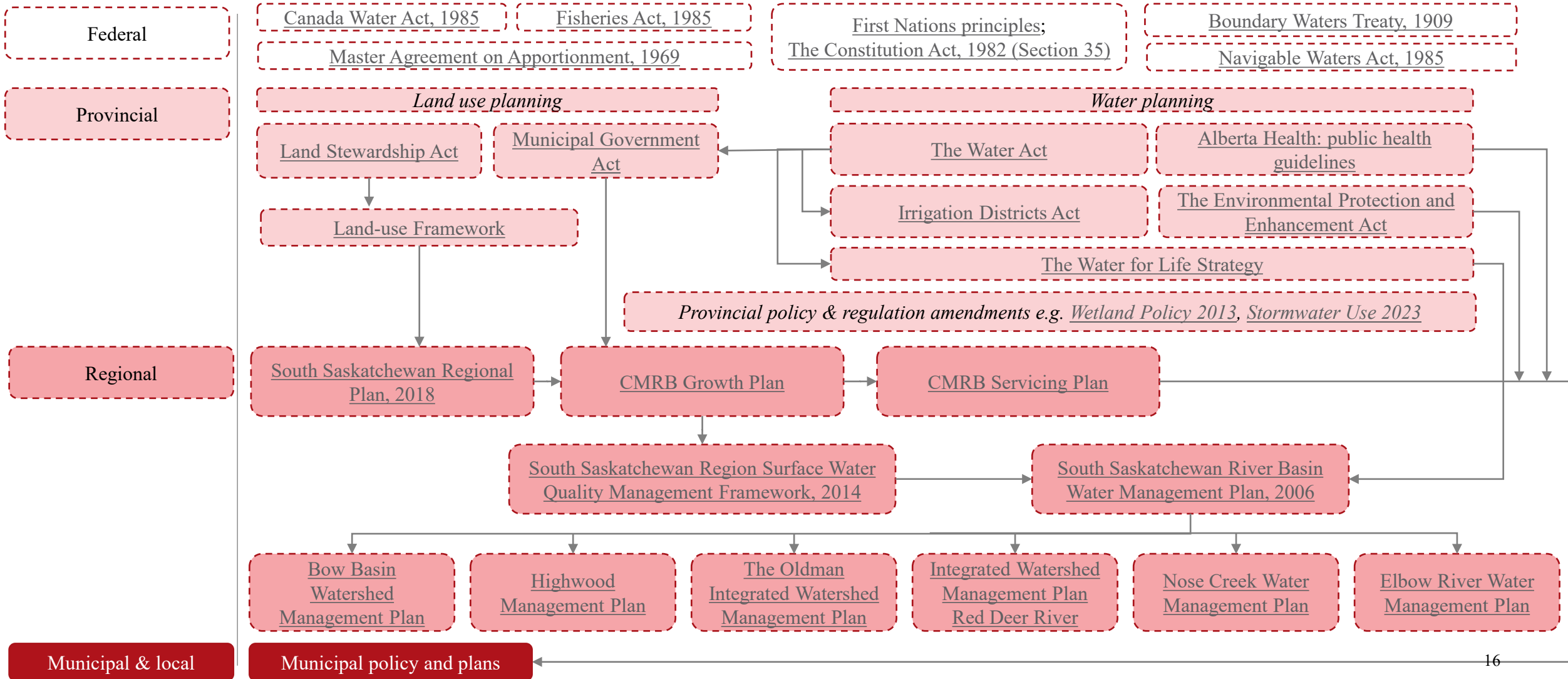
We recognise stakeholder interactions are complex and can be depicted in a variety of ways; the following page presents one view and aims to give a sense of the key policy context.

Please see Appendix 1 for more details on the OurWater Tool, where a list of the relevant policies and plans are compiled. OurWater also contains specific programmes and studies not included here.

2. Context

Relevant policies and plans can be found in OurWater tool or at hyperlinks in the text below.

Policy context



3. Recommendations

Prioritization Framework

Our recommendations for the CMRB Water Roadmap update are based on:

- Review of existing documentation including prior complexity studies reports
- Suggestions and insights from stakeholder engagement conducted specifically for this project, including regular engagement with the Water TAG.
- Arup's wider experience working with different clients globally around strategic water management

There are several water-related challenges in the region, all interlinked to some extent. The CMRB work on all the water-related matters that affect the region and its members. In order to help identify areas for focus and prioritisation, we applied a prioritization framework based on 3 criteria:

- **Challenges and issues:** The focus of CMRBs roadmap and work should respond to the main water-related challenges and issues facing the region.
- **Remit and reach:** CMRB's work must align with the organization's remit, as defined by its Mandate, and support and enable the Growth Plan and Servicing Plan. The focus should reflect common priorities among members and therefore the region as a whole.
- **Pragmatism and progress:** CMRB's work should build on existing foundations, leveraging existing platforms and not unduly duplicating efforts. The recommendations should be action-oriented, and progress should be demonstrable including through lower effort 'quick wins'. The capacity of both the CMRB executive and member municipalities needs to be considered.

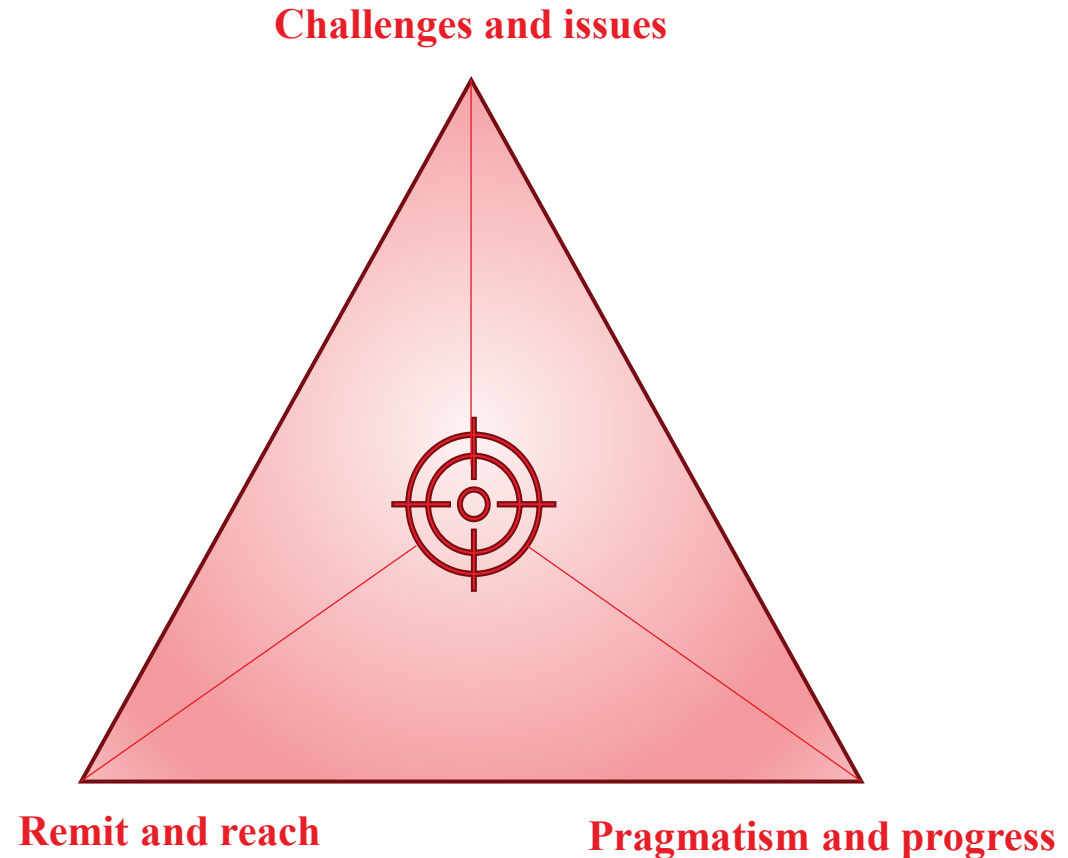
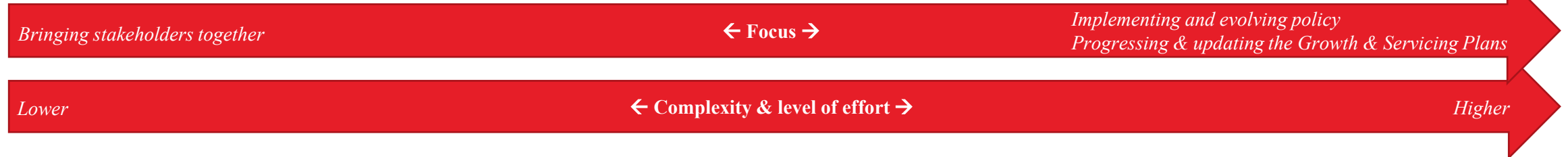


Figure 1: Prioritization framework used to provide recommendations

Overview of recommendations



Advocate	Convene	Enable	Promote	Elevate	Investigate
Engage with the provincial government specifically on water-related issues through a structured process and formal CMRB representation	Regularly bring relevant stakeholders together in a water-focused forum, to raise awareness and facilitate interactions	Increase (formal) representation on and participation in relevant watershed groups to support and enable interactions	Play an active, public-facing role in promoting awareness on water-related issues and promoting water conservation and efficiency (focused on quantity & quality)	Elevate collaboration on regional policy for water stewardship through short- and long-term Growth Plan and Servicing Plan updates.	Investigate feasibility of implementing regional, long-term water resource planning framework and process for water security and resilience purposes

Primary objectives from Growth Plan - Water Stewardship (GP 3.4)

“(c) Enhance regional collaboration of water stewardship.”	“(c) Enhance regional collaboration of water stewardship.”	“(a) Enhance protection of our watersheds and natural water systems.”	“(e) Improve the efficiency with which we use our limited water supply.”	“(c) Enhance regional collaboration of water stewardship.”	“(d) Enhance the Region’s resilience to changes to natural water systems, due to Climate Change and human development.”
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1. Advocate

Approved 2024 02 09

ARUP



Advocate

Engage with the provincial government specifically on water-related issues through a structured process and formal CMRB representation

Primary objectives from Growth Plan - Water Stewardship (GP 3.4):

“(c) Enhance regional collaboration of water stewardship.”

What?	Why?
<p>Set up a process to engage with the province in a structured, regular way at senior level to represent the region on water-related matters; to influence provincial priorities and advocate for necessary change or evolution in provincial legislation, regulation and policy; and to provide strong visibility of the leadership the region is taking on water management.</p> <p>Recommended to do this now or as soon as possible, with an eye on the 2024 update to the provincial government’s Water for Life strategy.</p>	<ul style="list-style-type: none"> • Good relationships exist, but there is no structured process for regular dialogue with the Alberta EPA that represents the region as a whole on key water related issues. ‘The benefit of strong government relationships cannot be underestimated’ (from interview). • There are barriers within the existing policy framework that were surfaced repeatedly in our engagement – such as on water recycling and stormwater re-use. This needs provincial-level engagement to continue to push for evolving the relevant policies. • This can help make the case for CMR wide carve-outs for policy or for it to be a proof-of-concept as a region if/when there is an appetite for that. • The province is open to the CMR/CMRB taking a leading role in tackling water-related issues. This would form part of that direction of travel. • This can make it easier for the EPA itself in terms of CMR/CMRB interactions and can help it advocate for change internally.
Policy focus	Level of effort
<ul style="list-style-type: none"> • To be agreed and can evolve • Initial focus could be on water recycling and stormwater re-use – including in context of exploring appetite for proof-of-concept within the region 	<p>L Relatively low level of effort.</p>
	<p>M The representative group would need to be identified and the process will take up some resources to run, but from a governance perspective this can be anchored into the existing TAG/Committee/Board process and cycles.</p>
	<p>H</p>
<h3>First step to take</h3>	
<p>Agree with province to put this in place (or to trial it)</p>	

Challenges and issues

The CMRB representative group would focus in on the major issues that face the region and that require provincial administration engagement.

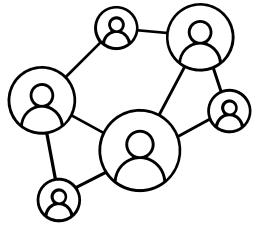
Remit & reach

In representing the region towards the province, this is a very logical role for the CMRB to take on.

Pragmatism & progress

This is relatively straightforward. It can be a quick win to set up, and should bear fruit over time. Immediate impact could be on the 2024 Water for Life strategy update. There is precedence of the CMR leading ahead of the province in terms of the 1:100/1:200 flood resilience policy.

2. Convene



Convene

Regularly bring relevant stakeholders together in a water-focused forum, to raise awareness and facilitate interactions

Primary objectives from Growth Plan - Water Stewardship (GP 3.4):

“(c) Enhance regional collaboration of water stewardship.”

What?	Why?				
<p>Provide a platform for regularly bringing together the regional stakeholders who are engaged or interested in water-related issues, or directly impacting the water situation (e.g. industry); to raise awareness, strengthen interactions and relationships, and build momentum around the focus on water.</p> <p>This could take on different formats – a plausible format would be an annual or semi-annual CMRB-organised conference focused on the sustainable management of water in the region.</p> <p>This would not be a public-facing activity, although the forum could evolve over time.</p>	<ul style="list-style-type: none"> Regional or sub-regional organisations and forums do exist (such as WPACs and WSGs), and there are individuals who are central to regional water management across institutions, but there currently isn't an open forum that facilitates all interested and relevant parties coming together. In our stakeholder engagement it was repeatedly suggested that there could be a role for the CMRB in convening stakeholders and communicating on the issues and challenges as well as the ongoing initiatives. It allows for the CMRB to communicate its messages more widely – the benefit of which was evident also from our stakeholder engagement. It allows the CMRB to push the conversation around specific themes, such as the interaction between land use and water impact This can strengthen the network around and focus on water and add to the momentum of growing awareness of the challenges facing the water system. It would put the CMRB more visibly central to regional water conversations. 				
Policy focus	Level of effort				
<ul style="list-style-type: none"> This recommendation doesn't have a pre-defined policy area as focus. It is very much focused on bringing stakeholders together. For any event one or more specific policy areas could be focused on 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #e0b0ff; text-align: center; width: 10%;">L</td> <td rowspan="3" style="background-color: #f0f0f0; padding: 5px;">Relatively low level of effort. Assuming this takes the format of an annual conference, this would require mainly organisational resourcing and would come at some cost (depending on the funding of the conference – eg ticketing, sponsorship, etc.)</td> </tr> <tr> <td style="background-color: #800080; color: white; text-align: center;">M</td> </tr> <tr> <td style="background-color: #4b0082; color: white; text-align: center;">H</td> </tr> </table>	L	Relatively low level of effort. Assuming this takes the format of an annual conference, this would require mainly organisational resourcing and would come at some cost (depending on the funding of the conference – eg ticketing, sponsorship, etc.)	M	H
L	Relatively low level of effort. Assuming this takes the format of an annual conference, this would require mainly organisational resourcing and would come at some cost (depending on the funding of the conference – eg ticketing, sponsorship, etc.)				
M					
H					
<h3>First step to take</h3>					
<p>Pick a date and venue for a first conference in 2024</p>					

Challenges and issues

The conference can cover any of the main challenges and issues, and the CMRB can identify themes for the conference or sections within it.

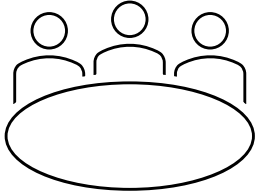
Remit & reach

The CMRB is a logical convening body for region-wide stakeholders engaged in water-related issues.

Pragmatism & progress

This is straightforward to do. It can be a quick win in terms of organising a first convening event – after which the benefit/impact can be evaluated as to whether it was of benefit and whether to continue and/or to evolve the format.

3. Enable



Enable

Increase (formal) representation on and participation in relevant watershed groups to support and enable interactions

Primary objectives from Growth Plan - Water Stewardship (GP 3.4):

“(a) Enhance protection of our watersheds and natural water systems.”

What?	Why?
<p>In the first instance this could be a renewed focus by individual municipalities on participating as intended. Then this could be for e.g. the Water TAG to consider the most effective and efficient way of participating, i.e. to understand what is the optimal ‘matrix’ of municipality representation on the different groups; and to consider if having a CMRB representative would be more efficient or effective.</p>	<ul style="list-style-type: none"> • There is participation by municipalities already, although interviews suggested this can differ between municipalities, likely due to capacity. • Aligns with prior recommendation in stormwater background report: “Watershed planning in Alberta brings together diverse stakeholders to establish watershed-specific targets for water quality and quantity. The CMRB may wish to encourage its member municipalities to actively participate in these initiatives and ensure that appropriate watershed targets are adopted in each intermunicipal subwatershed and recognized in statutory land use plans, where appropriate.” • In interviews it was surfaced that greater CMR municipality participation in watershed planning groups would be welcomed and beneficial. It was also mentioned that this could help ‘reinvigorate’ these groups. • It is an efficient and effective way of facilitating interaction between the watershed planning groups and the CMRB and/or its member municipalities, and integration between watershed management plans and (implementation of) the Growth and Servicing Plans. • It can help build capacity and knowledge within the municipalities to support that link with CMRB and local plans • Will be recognised by watershed planning groups as clear, immediate and concrete action on the back of engagement on water roadmap update.

Policy focus	Level of effort								
<ul style="list-style-type: none"> • To be agreed, and there does not have to be one (initially) with the first stage focusing on improving and reinvigorating the engagement • A logical policy focus area could be sourcewater protection given the key roles of watershed groups in this context (and on which existing approaches can be shared across members) 	<table border="1"> <tr> <td data-bbox="1159 1042 1286 1113">L</td> <td data-bbox="1286 1042 1987 1413" rowspan="3"> Relatively low level of effort. Although recognising that for smaller CMR member municipalities the capacity to support (multiple) watershed groups can be limited. Consideration could be given to combining representation across municipalities. </td> </tr> <tr> <td data-bbox="1159 1113 1286 1185">M</td> </tr> <tr> <td data-bbox="1159 1185 1286 1256">H</td> </tr> <tr> <td colspan="2" data-bbox="1159 1256 1987 1320"> <h3>First step to take</h3> </td> </tr> <tr> <td colspan="2" data-bbox="1159 1320 1987 1413"> Draw up matrix of current CMRB member engagement with watershed groups </td> </tr> </table>	L	Relatively low level of effort. Although recognising that for smaller CMR member municipalities the capacity to support (multiple) watershed groups can be limited. Consideration could be given to combining representation across municipalities.	M	H	<h3>First step to take</h3>		Draw up matrix of current CMRB member engagement with watershed groups	
L	Relatively low level of effort. Although recognising that for smaller CMR member municipalities the capacity to support (multiple) watershed groups can be limited. Consideration could be given to combining representation across municipalities.								
M									
H									
<h3>First step to take</h3>									
Draw up matrix of current CMRB member engagement with watershed groups									



Challenges and issues

Would support focus on key issues under consideration by the watershed planning groups

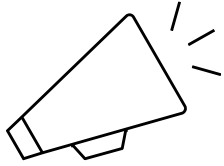
Remit & reach

Promotes integration between CMR member municipalities and other regional stakeholders.

Pragmatism & progress

Straightforward recommendation to implement

4. Promote



Promote

Play an active, public-facing role in generating awareness on water-related issues and promoting water conservation and efficiency (focused on quantity & quality)

Primary objectives from Growth Plan - Water Stewardship (GP 3.4):

“(e) Improve the efficiency with which we use our limited water supply.”

What?	Why?
<p>Co-ordinate a sustained, regional public campaign around the water-related challenges and issues facing the region, promoting awareness of the role all have to play in addressing these. This would build on and complement the strong foundation of individual municipality water conservation and efficiency initiatives.</p> <p>In terms of implementation this could adopt an approach similar to the Growth Plan communication campaign.</p>	<ul style="list-style-type: none"> • Public, citizen and customer behaviour change will (continue to) play a critical role in addressing the short-, medium- and long-term water resource availability pressures also in the context of climate change impacts. A focus on public water conservation and efficiency efforts is a no regrets activity. • Aligns with the AE 2019 “Water Use and Conservation in the Calgary Metropolitan Region Study” which includes an opportunity identified as ‘Implement Conservation and Efficiency Measures: Public Engagement’. • Per capita consumption in the region has improved – yet remains high compared to some other parts of the world, where the ambitions are being pushed even further. Noting that this should focus on the impacts of behaviours on both water quantity and water quality. • Allows the CMRB to take a leading role in moving public engagement activities beyond individual municipalities; and allows the CMR to be potentially world-leading in its public engagement and education activity. • Could raise the profile of the CMRB as an organisation (if desirable). • Focus on engagement and education keeps this away from directing targets or rates for the region – impactful but of reduced complexity • Pooling resources across members can allow for more efficient and effective spend • Lessons can be learned across CMR municipalities, other cities and regions nationally as well as internationally.

Policy focus	Level of effort
<ul style="list-style-type: none"> • This is fully focused on water efficiency and demand-side management (which plays into water security and long-term resilience including in the context of population growth and climate change) 	L
	M
	H
<p>First step to take</p> <p>Set public campaign objectives</p>	

Challenges and issues

Water conservation and efficiency speaks directly to the #1 issue identified by all stakeholders: short-, medium- and long-term water resource availability challenges.

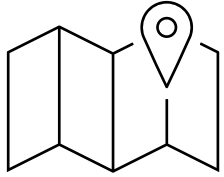
Remit & reach

Region-wide campaign logically co-ordinated by the CMRB. CMRB backing will add legitimacy to the messaging.

Pragmatism & progress

Builds on strong foundation of existing activity within municipalities, and good practice can be imported from elsewhere nationally and internationally. Avoids governance complexity that would come with directing rates or conservation targets.

5. Elevate



Elevate

Elevate collaboration on regional policy for water stewardship through short- and long-term Growth Plan and Servicing Plan updates.

Primary objectives from Growth Plan - Water Stewardship (GP 3.4):

“(c) Enhance regional collaboration of water stewardship.”

What?	Why?
<p>Building on the emerging collaboration around water servicing for preferred growth areas, elevate and broaden this out to assist in achieving other water-related growth plan objectives and servicing priorities. It would look to promote and adopt leading practices in terms of water conservation and efficiency, source water protection, mitigating risks to municipalities from climate change, and flood and drought management.</p>	<ul style="list-style-type: none"> Water Stewardship is central to the Growth Plan and Servicing Plan (Section 4.3). This recommendation strengthens a commitment to updating this section in shorter- and longer-term Growth Plan updates, with particular focus on source water protection, drought, flood, and risks from climate change. The preferred placetypes and preferred growth areas are central to the Growth Plan and Servicing Plan, and this also strengthens that focus, especially in the context of the long-term Growth Plan update. It builds on the emerging collaboration around water servicing for preferred growth areas, and supports member municipalities to jointly grow insight into key challenges and potential policy solutions, aligning terminology and developing a shared understanding. It looks to deliver on multiple other water-related Growth Plan objectives and Servicing Plan priorities. It can help make the case towards the province for any policy proof-of-concepts or regulatory carve-outs that may be necessary. It would look to promote leading practices around water conservation and efficiency, source water protection, mitigating risks to municipalities from climate change, and flood and drought management.

Policy focus	Level of effort
<ul style="list-style-type: none"> This is focused on implementing and evolving regional integrated planning and should directly inform the Growth Plan and Service Plan shorter- and longer-term updates. 	L
	M
	H
	<p>Relatively high level of effort. Roles of CMRB vs (combination of) individual municipalities involved in specific preferred growth areas will need to be identified and developed further.</p>
	<h3>First step to take</h3> <p>Explore and document best practices and effective policy tools for member municipalities to consider.</p>

Challenges and issues

Integrated planning will address multiple of the regional water challenges and issues.

Remit & reach

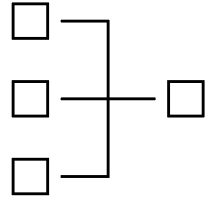
Focus on promoting best practice and evolving water policy in the CMRB. Role of CMRB vs. municipalities to be identified.

Pragmatism & progress

It supports targeted achievement of multiple GP & SP objectives and priorities.
Balances short-term updates with longer-term policy development.

6. Investigate

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Investigate

Investigate feasibility of implementing regional, long-term water resource planning framework and process for water security and resilience purposes

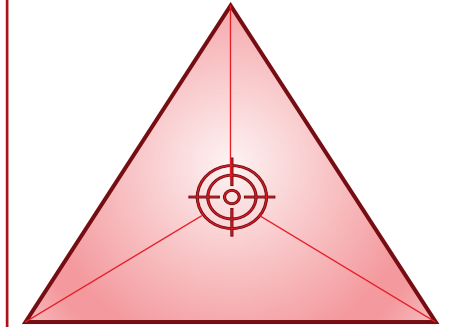
Primary objectives from Growth Plan - Water Stewardship (GP 3.4):

“(d) Enhance the Region’s resilience to changes to natural water systems, due to Climate Change and human development.”

What?	Why?
<p>Investigate feasibility and desirability of setting up a regional water resource planning framework and process that looks into long-term availability and needs and builds a comprehensive picture of supply-side and demand-side solutions to be implemented over time.</p>	<ul style="list-style-type: none"> It takes a regional approach to the #1 issue affecting all areas within it – the availability and sustainability of water resources to support social, environmental and economic well-being of the region over the long-term. The impacts of climate change make for far greater uncertainty and variability, further necessitating the need for more integrated long-term water resource management There is no integrated view and plan, despite the recognition of the challenges and issues and the extensive efforts and initiatives to address those (on a more fragmented basis). Due to this fragmentation, the extent to which ongoing and planned initiatives add up to meet long-term resource needs is unclear. It brings together the multiple solutions that stakeholders are advocating for – such as more effective water trading, increased water conservation and efficiency, greater water reuse and stormwater management. It can build on the existing work and institutions/organisations such as through the BRBC. It can bring more voices to the table, such as Indigenous Nations, encouraging integration in regional planning. There is precedence to learn from international examples, such as the recently established National Framework and Regional Planning processes in England & Wales. → In recognition of the complexity and effort associated with designing and implementing such an approach, this is included as a recommendation to investigate in the first place as part of the roadmap update.

Policy focus	Level of effort
<ul style="list-style-type: none"> This is focused on water security and long-term resilience including in the context of population growth and climate change It speaks directly to consideration of alternate or new water governance structures per the Growth Plan (3.4.4) The outcomes would directly inform the growth plan and servicing plan shorter- and longer-term updates 	L
	M
	H
	<p>Medium level of effort to investigate. Very high level of effort if taken forward for implementation. This would need to be considered and developed in close collaboration with the province, who likely will need to take an active role in the implementation.</p>
	First step to take
	Identify existing models that could be used as (partial) blueprint

ARUP



Challenges and issues

Major focus on the #1 issue: long-term water resource availability & sustainability

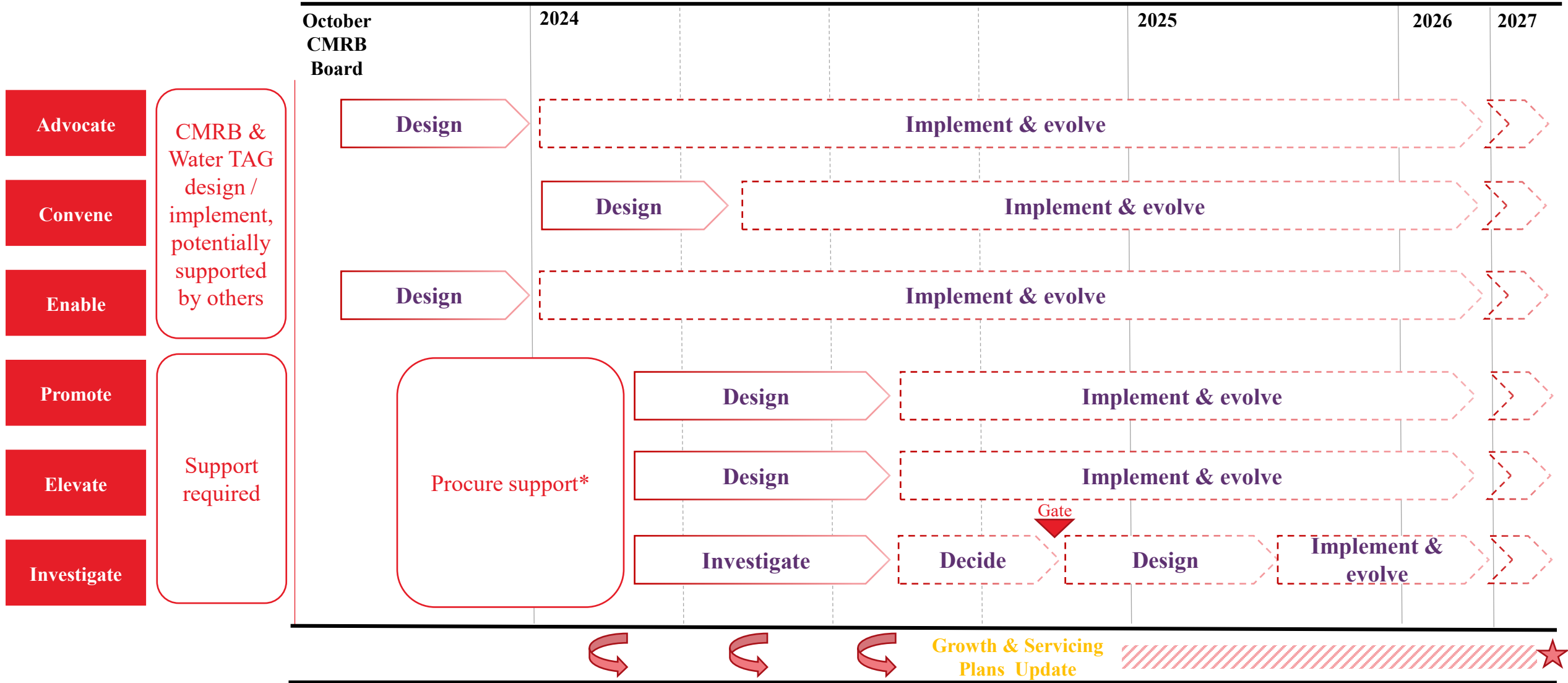
Remit & reach

While enabling multiple GP and SP objectives and priorities, could be beyond the remit of the CMRB. Investigation stage needs to consider roles including for province.

Pragmatism & progress

Deliberately recommended as an investigation only at this stage and for the purposes of the roadmap. This is complex to take forward, and respective roles of CMRB, province, WPACs and others would need to be considered. Remit aside, would be beyond the capacity and capability of the CMRB as currently set up. ²⁴

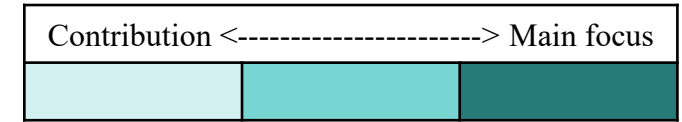
Potential high-level roadmap



Roadmap is illustrative only

* Multiple procurement options eg broken into individual packages or combined. Could be run as a programme (which could then also bring in project management of some/all of advocate, convene, enable – ie entire roadmap run as a programme).

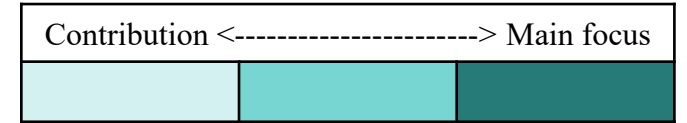
Focus & prioritisation against GP



		Advocate	Convene	Promote	Enable	Elevate	Investigate
3.2 Economic wellbeing	3.2.3 Agricultural economy						
3.3 Protect and enjoy the environment	3.3.1 Flood prone areas						
	3.3.2 Environmentally sensitive areas						
	3.3.3 Climate change						
3.4 Water stewardship	3.4.1 Watershed protection						
	3.4.2 Stormwater management						
	3.4.3 Water efficiency						
	3.4.4 Collaboration of governance						
3.5 Shared services optimisation	3.5.2 Energy & utilities corridors						
	3.5.3 Planning and protection for regional corridors						
	3.5.4 Recreation						

This is a qualitative overview, and there will be interactions and connections that are not necessarily represented here

Focus & prioritisation against SP



		Advocate	Convene	Promote	Enable	Elevate	Investigate
Transport and transit	3.2.1.3 Transportation and utility corridors†						
	3.2.2.1 Joint planning area context studies*						
Long term water strategy	4.2.1.1 Watershed planning†						
	4.2.1.2 Water use and efficiency†						
	4.2.1.3 Advocacy†						
	4.2.2.1 Opportunity for learning*						
Water and wastewater servicing	5.2.1.1 Regional utility system†						
	5.2.2.1 Sub-regional servicing *						
Stormwater management	6.2.1.1 Stormwater use and water reuse†						
	6.2.1.2 Regional initiatives†						
	6.2.2.1 Context studies for joint planning areas *						
Recreation	7.2.1.1 Regional collaboration†						

This is a qualitative overview, and there will be interactions and connections that are not necessarily represented here

Approved 2024 02 09

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Appendix 1

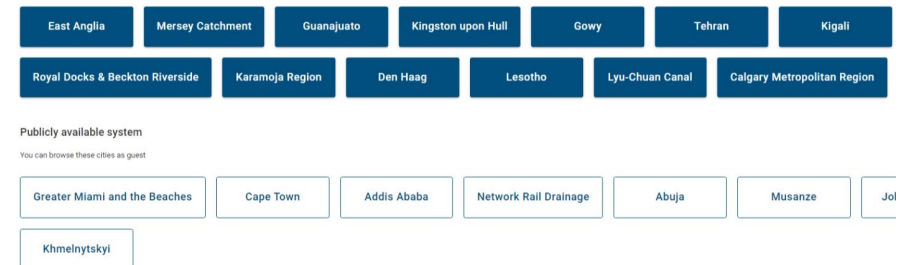
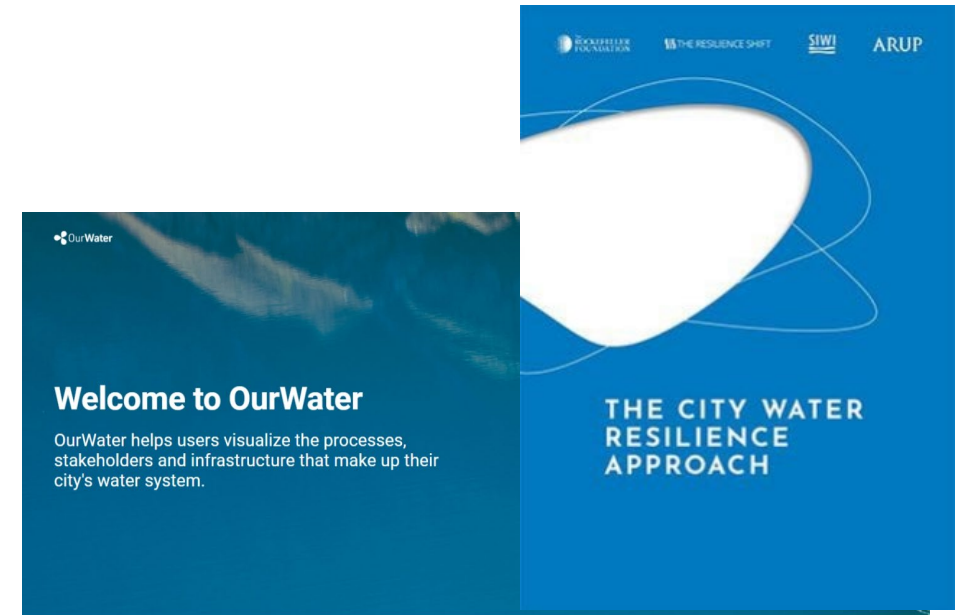
OurWater Tool

Introduction to Our Water

One of the key components of the City Water Resilience Approach, in part being applied during this project, is OurWater. This is an online tool that aims to improve water governance through coordination and knowledge-sharing between actors working in the water system of a city, utility or region. This is achieved by visualizing the water cycle.

The key components of the water cycle in this tool are **natural assets, physical assets and users**. The tool allows the customer or consultant to input the assets relevant in their regions and construct a simple process flow diagram representing where water flows among assets and users. **Shocks and stressors** as well as their degree of risk can be indicated for each asset or user. This can be pressures such as pollution, drought or flood. Lastly, **stakeholders** relevant to each asset/user, in roles such as ownership, management, regulation or financing, can be assigned.

This results in a representation of a region’s water system and it’s main parts. It allows for the visualization of where stressors are located and who they affect. Furthermore the tool allows for the mapping of all relevant stakeholders, revealing associations between actors and opportunities for collaboration.



OurWater for CMR

Sources of data & Assumptions

To construct the Calgary Metropolitan Region OurWater we conducted desktop research to collect and review all existing information and studies. Key parts of existing, publicly available information, such as geographical and infrastructural maps, servicing agreements and capacity studies were used as input to the water cycle.

Key studies used for defining the structure, assets and users of the CMR OurWater Watercycle include;

- CMRB (2022) *Servicing plan*
- WaterSMART (2019) *Natural and managed capacity of regional water supply in the Calgary Metropolitan Region*
- Urban Systems (2019) *CMR Existing water & wastewater servicing & Regional potential*
- Alberta Government (2014) *South Saskatchewan Region Surface Water Quality Management Framework*
- Associated Engineering (2019) *Water Use and Conservation in the CMR Study*
- (2019) *CMR Stormwater background Report*

Shocks & Stressors were identified as key pressures on the system, namely water availability, water quality impacts and flooding, and stormwater management. A risk evaluation on each asset was done, consisting of the combination of likelihood and consequence of the stressor. The likelihood and consequence were defined using the following criteria;

Water pollution

The *South Saskatchewan Region Surface Water Quality Management Framework* was used to create first pass. This was later refined with the CMRB Administration. Likelihood of pollution was associated with the presence of urban development, agriculture and industry. Consequence was graded by the density of population affected.

Water availability

The *Natural and managed capacity of regional water supply in the CMR Study* was the principal source for risk assessment of water availability. Likelihood of low water availability was assessed based on dependence on snowmelt and presence of large storage infrastructure. Sub watersheds dependant on snowmelt and lacking storage were assessed with highest likelihood. Consequence of low availability was graded by the density of population affected.

Service Capacity

The CMR Existing Water & Wastewater servicing & Regional Potential (2019) was the principal evidence base for the assessment of stress on service. The likelihood of stress on service capacity was graded by the cumulative deficit between projected 20-year population equivalent against the existing water treatment plant capacity and annual licence diversion volume.

Flooding & Stormwater Management

Studies at required granularity were lacking, therefore this was assessed qualitatively with the CMRB Administration.

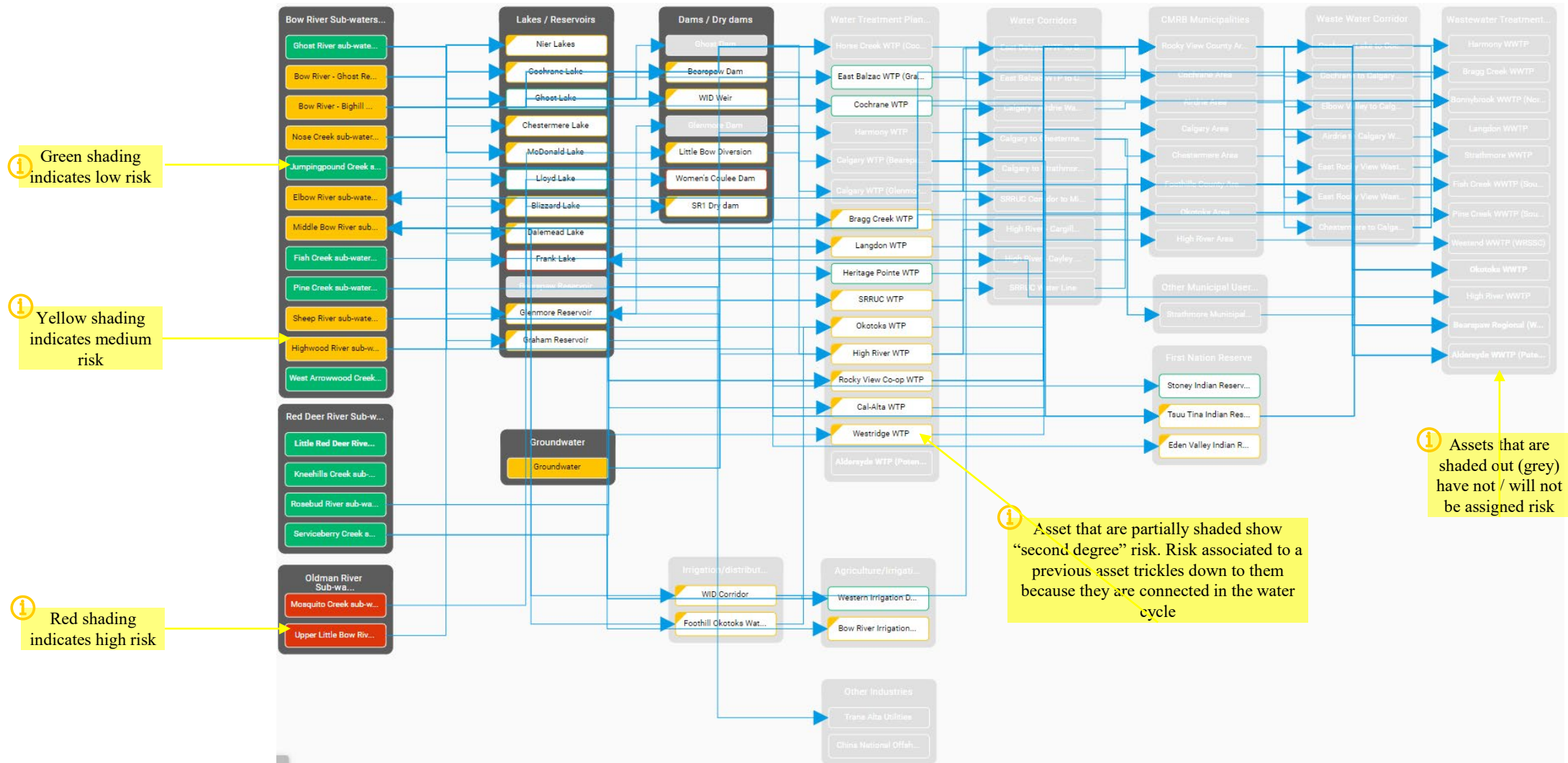
Presentation of CMR OurWater

a. Water Cycle - Overall structure, assets and users



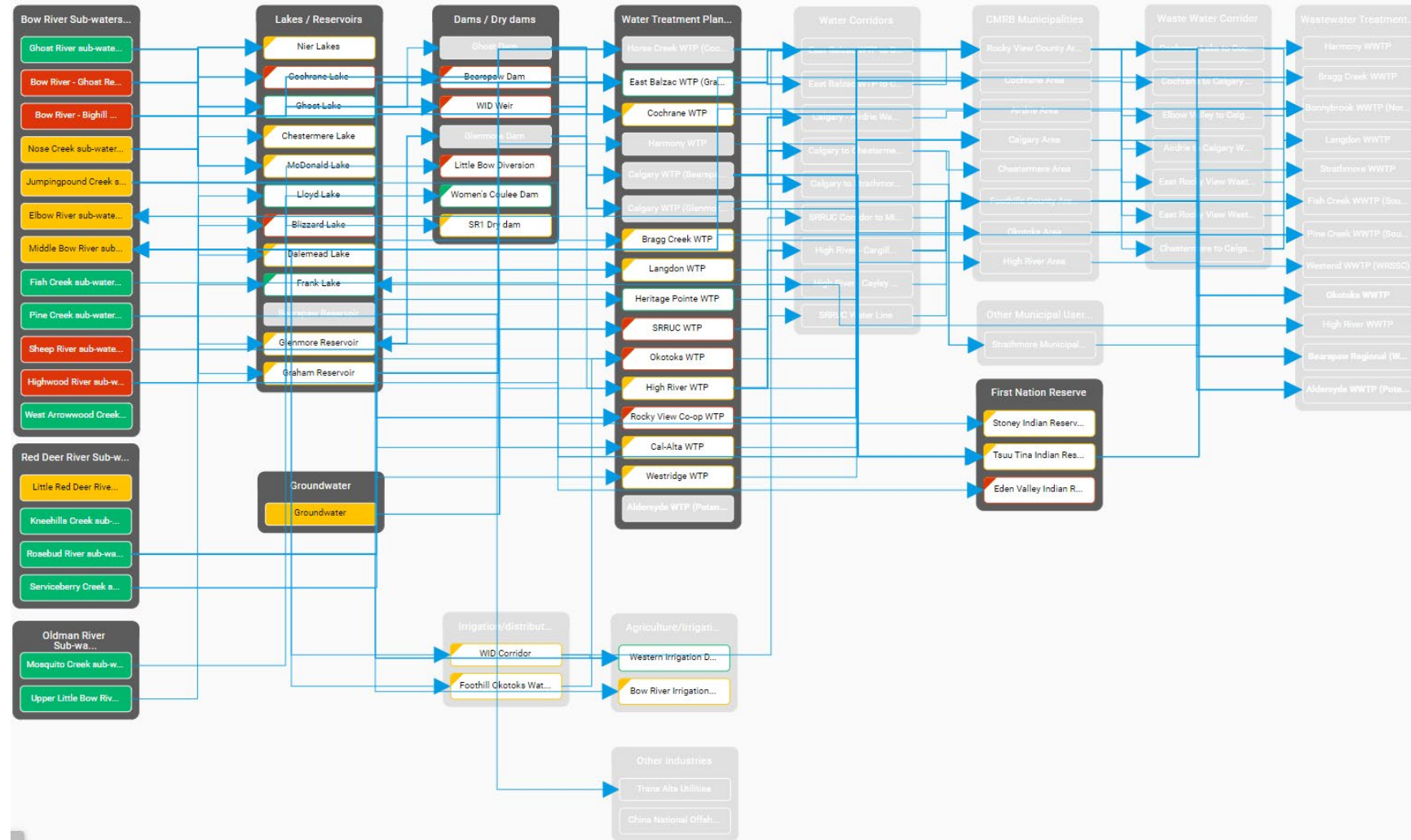
Presentation of CMR OurWater

b. Water Cycle - Shocks and Stressors (Water Pollution)



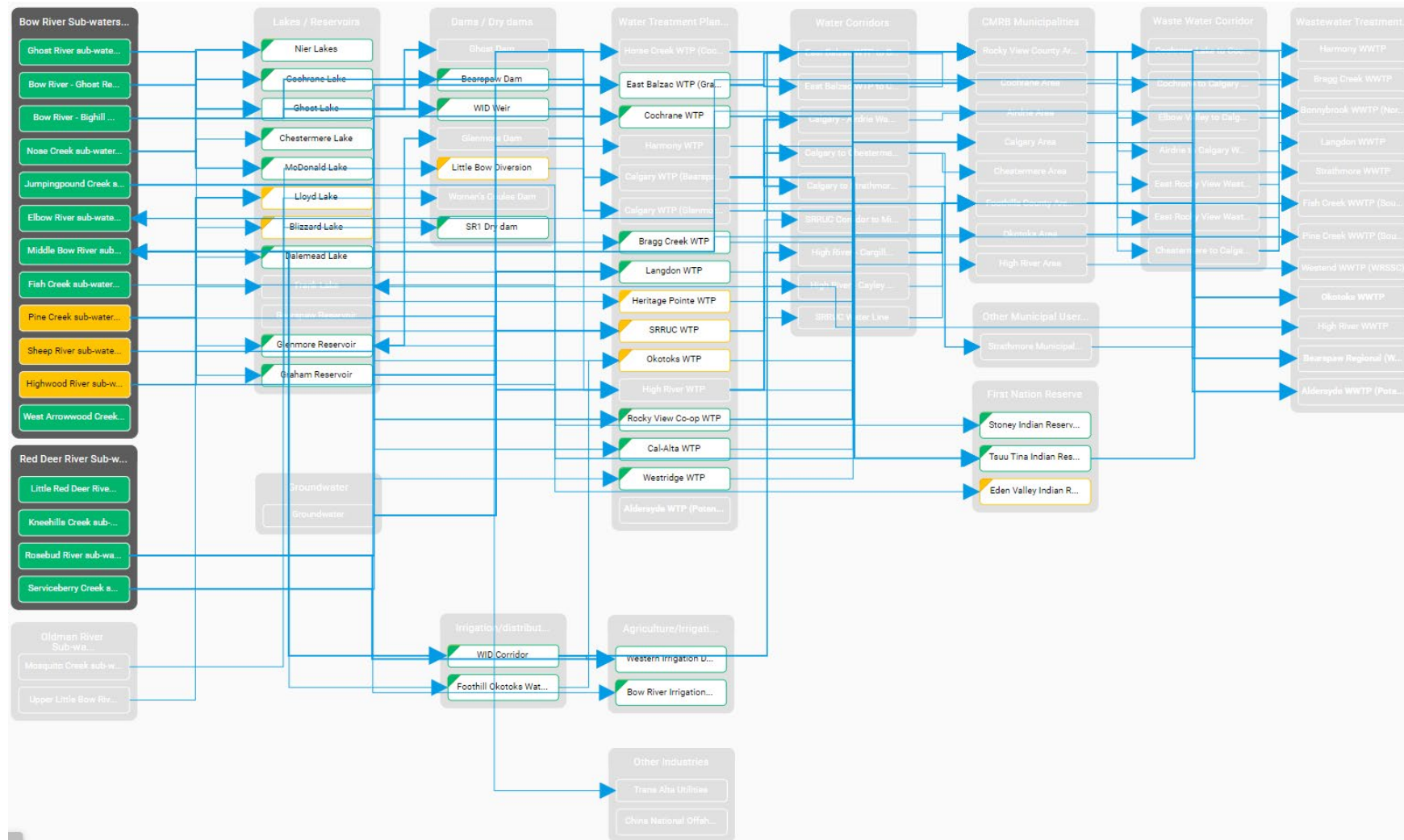
Presentation of CMR OurWater

b. Water Cycle - Shocks and Stressors (Water Availability)



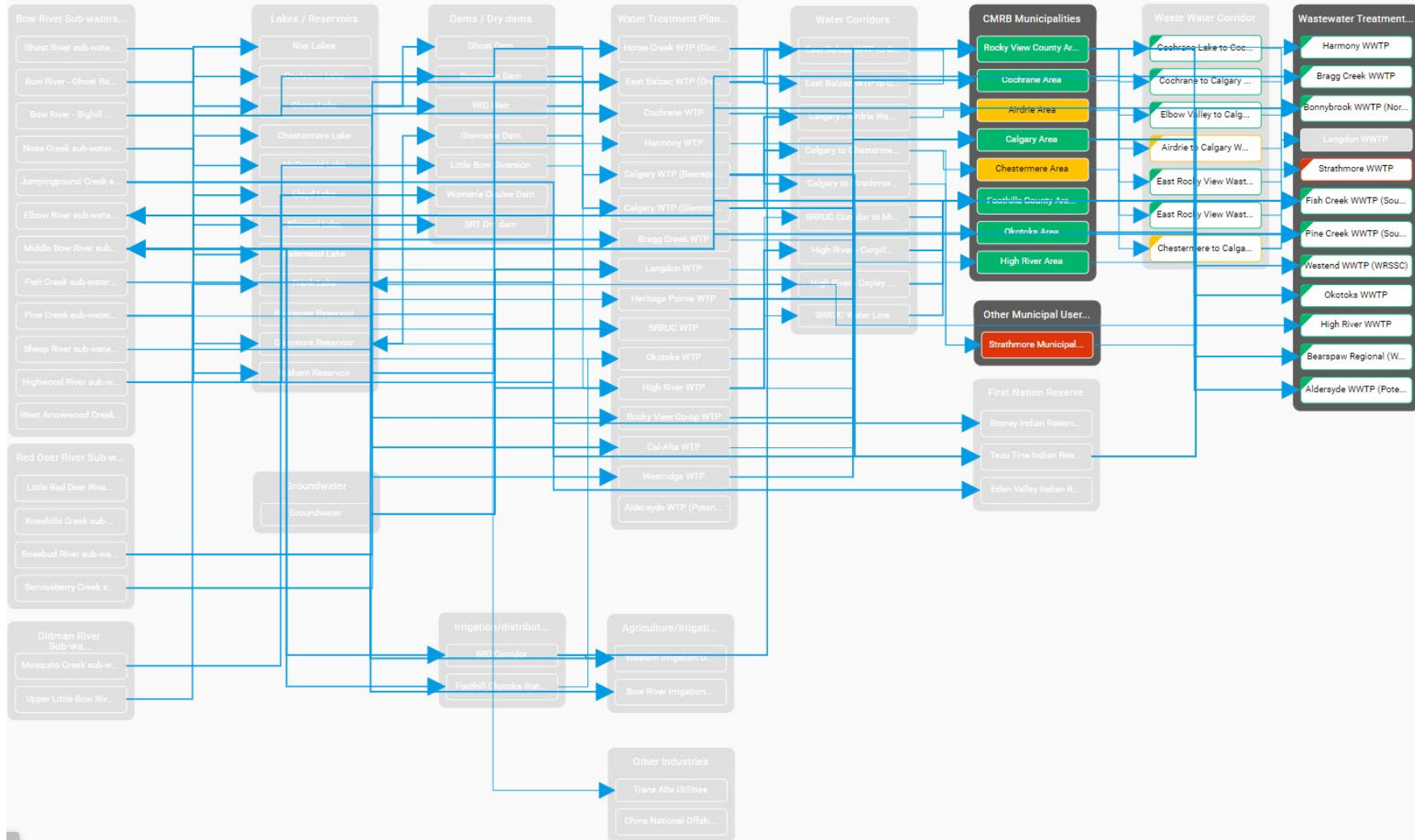
Presentation of CMR OurWater

b. Water Cycle - Shocks and Stressors (Flooding)



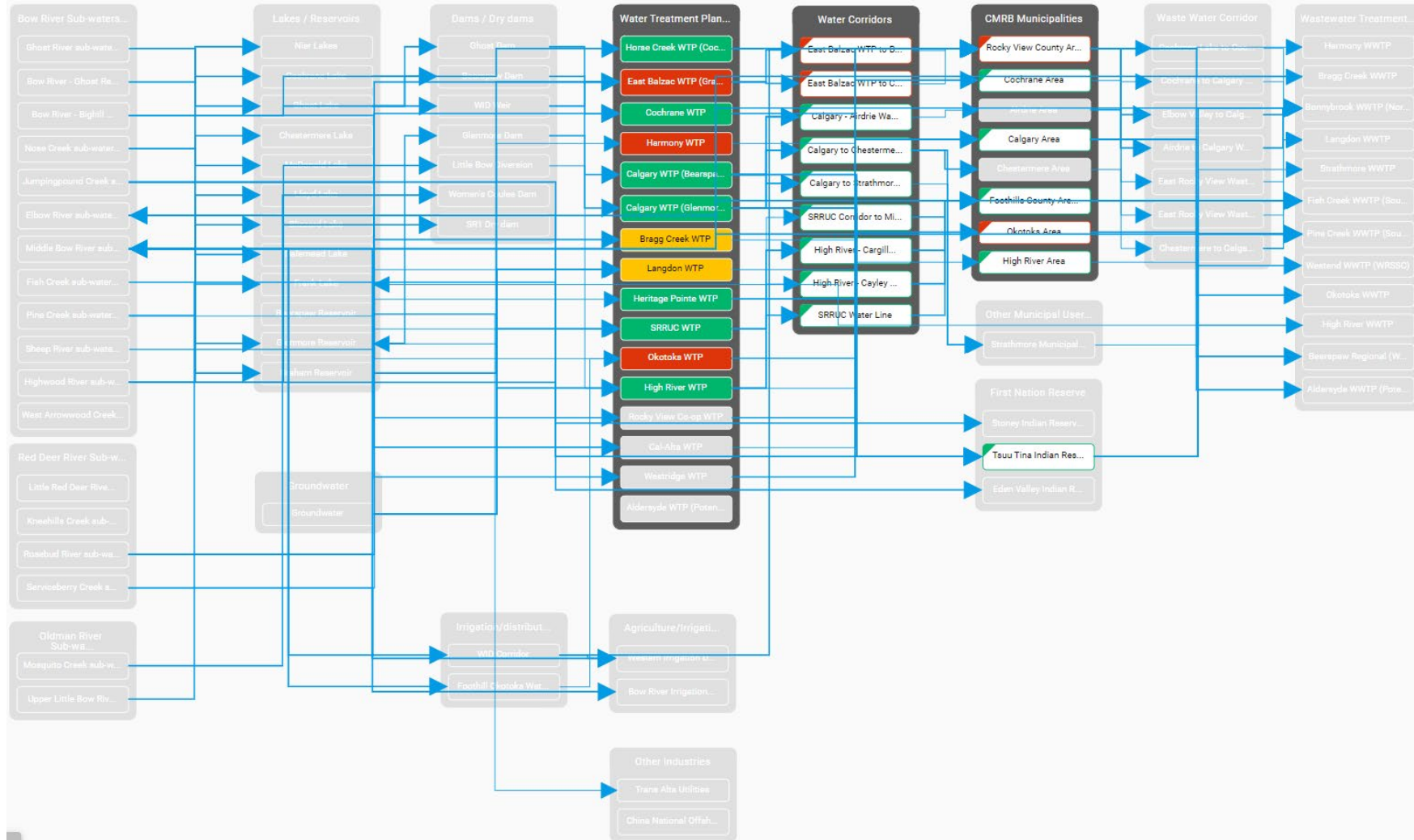
Presentation of CMR OurWater

b. Water Cycle - Shocks and Stressors (Stormwater Management)



Presentation of CMR OurWater

b. Water Cycle - Shocks and Stressors (Service Capacity)

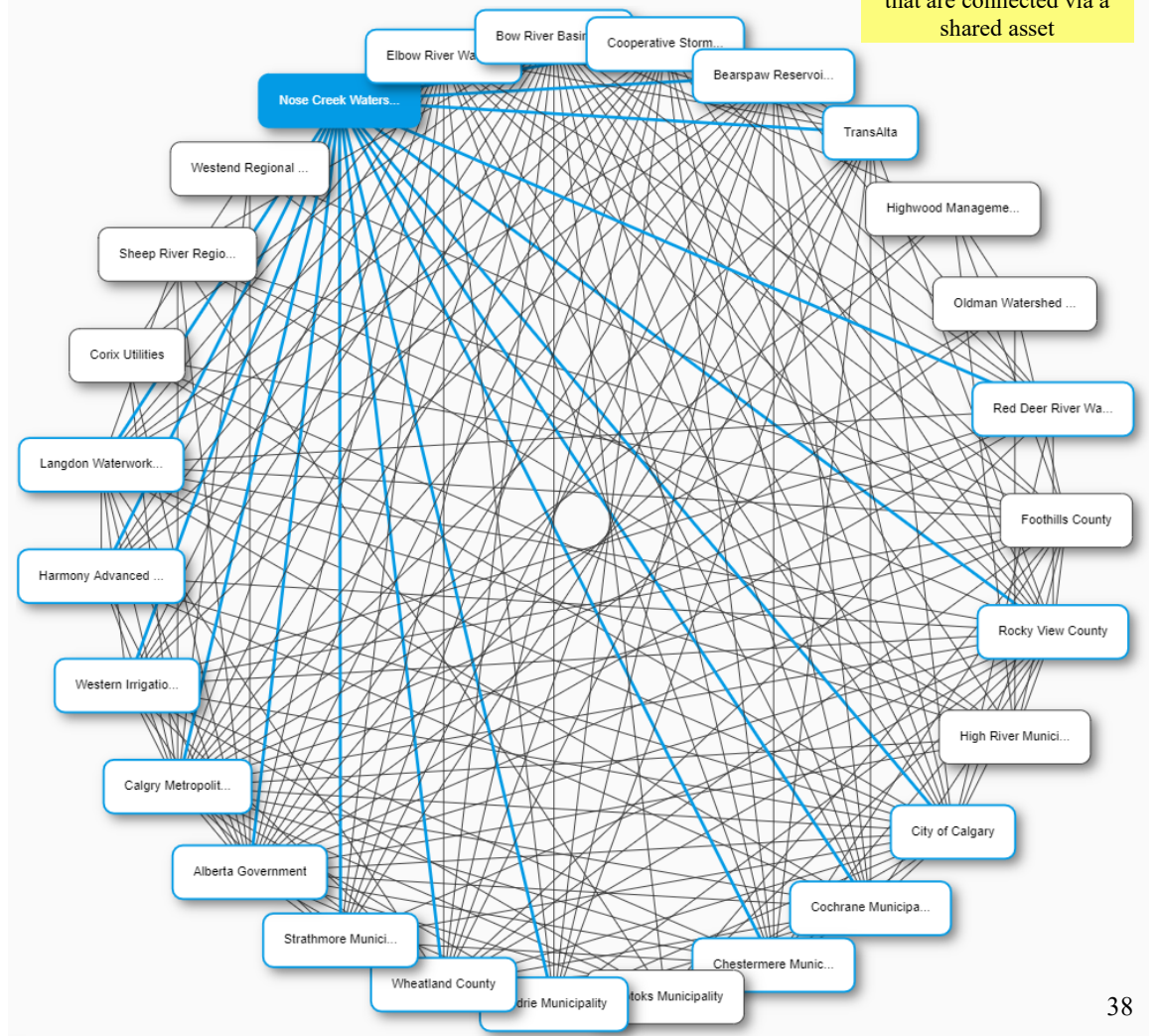
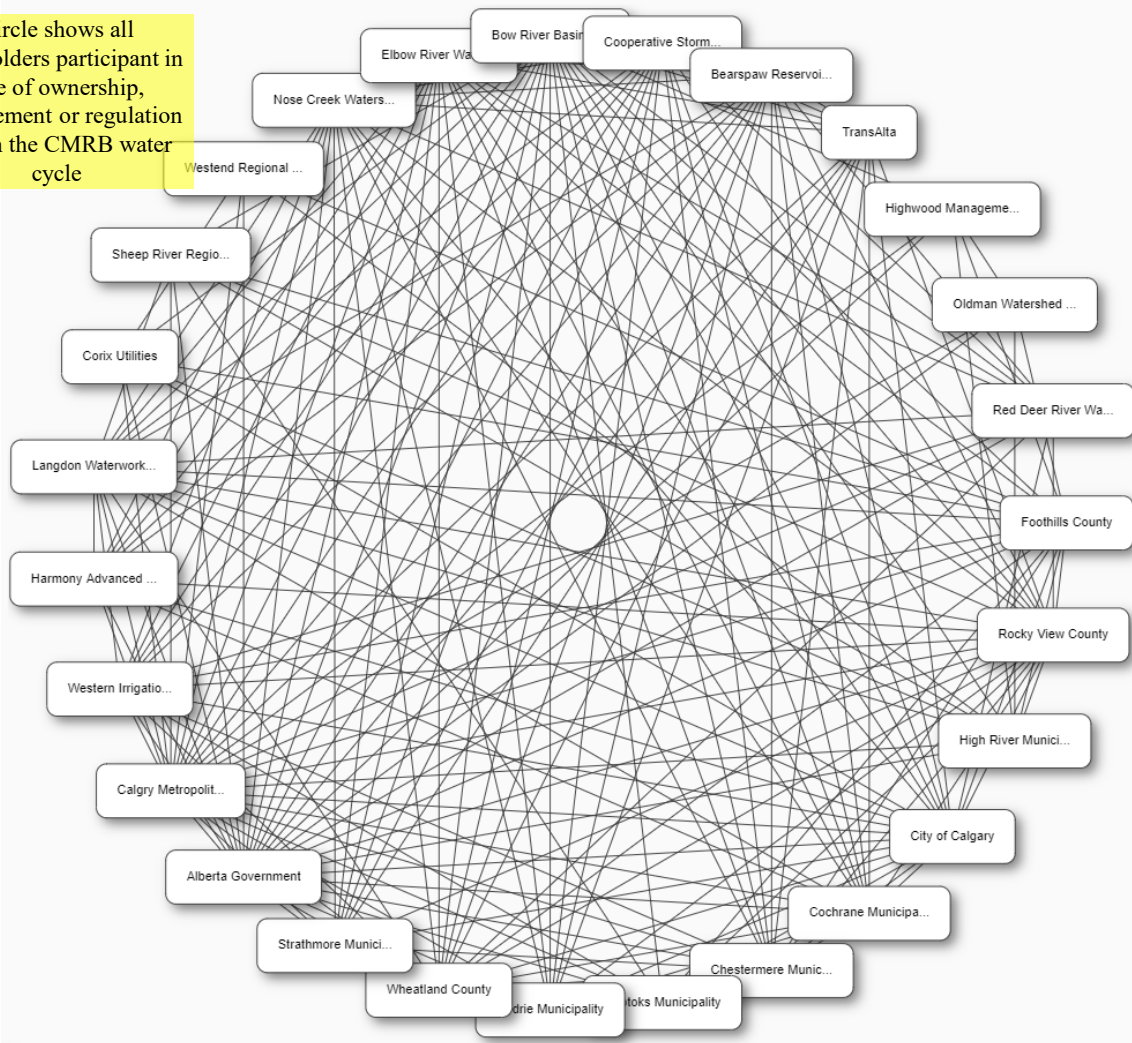


Presentation of CMR OurWater

c. Stakeholders

Lines indicate stakeholders that are connected via a shared asset

Circle shows all stakeholders participant in role of ownership, management or regulation within the CMRB water cycle



Presentation of CMR OurWater

c. Projects and Programmes

i Each line represents a policy, study or programme that has been developed. Each can be expanded to show further detail including basic information, shocks and stresses mitigated and stakeholders involved.

[Policy/Strategy] The Water Act	Completed	▼
[Policy/Strategy] Approved Water Management Plan for the South Saskatchewan River Basin	Completed	▼
[Study] Natural and Managed Capacity of Regional Water Supply in the CMR	Completed	▼
[Study] CMR Stormwater Background Report	Completed	▼
[Study] Water Use and Conservation in the Calgary Metropolitan Region Study	Completed	▼
[Policy/Strategy] City of Calgary Source Water Protection Plan	Completed	▼
[Policy/Strategy] City of Calgary Source Water Protection Policy	Completed	▼
[Policy/Strategy] Water for Life: Alberta's Strategy for Sustainability	Completed	▼
[Policy/Strategy] CMRB Regional Evaluation Framework	Completed	▼
[Policy/Strategy] South Saskatchewan- Region Surface Water Quality Management Framework	Completed	▼
[Policy/Strategy] South Saskatchewan Regional Plan (SSRP)	Completed	▼
[Policy/Strategy] CMRB Water Roadmap Stage 1 Report	Completed	▼
[Policy/Strategy] The Bow River Phosphorus Management Plan (PMP)	Completed	+

Note: This screenshot shows only a part of the repository

Appendix 2

Stakeholder engagement feedback

Stakeholder engagement

Summary of stakeholder engagement feedback

	Category	Organization
1	Water Service Providers	CalAlta Waterworks
2	Water Service Providers	Rocky View Water Coop
3	Watershed Stewardship Groups	Highwood Management Plan Public Advisory Committee
4	Watershed Planning and Advisory Councils	Bow River Basin Council
5	Watershed Stewardship Groups	Nose Creek Watershed Partnership
6	Irrigation	Bow River Irrigation District
7	Provincial gov.	Alberta Environment and Protected Areas
8	Industry	TransAlta
9	Watershed Planning and Advisory Councils	Oldman River Watershed Council
10	Municipality	City of Calgary

Table: List of interviews conducted

Engagement findings

Common themes of discussion

Water resource availability

Limited water resource availability was identified by most interviewees as the greatest issue experienced by the region. Most interviewees expressed there was simply not enough resources to regional growth and water intensive industries, however localized surplus / deficits in sub-watersheds was an important nuance. Many stakeholders also commented that this challenge will be exacerbated with climate change.

Water Allocation, licensing and transfer mechanism

In context of the above, allocation, licenses and transfer mechanisms were a reoccurring theme of discussion. The overarching impression is that closing the basin to new licenses was positive, however there was concern that licenses are not sufficient to support planned growth. Furthermore, there are considerable limitations and gaps related to the distribution of the licenses and their transfers, related to legacy structures, prioritization mechanisms and barriers within the transfer market.

Link between land use and water planning

A disconnection between land use and water resource planning was noted among various interviewees, as evidenced by the separation of planning and permitting processes, in which needs and impacts of development on water resources are not systematically recognized or understood. This is associated to challenges of water resource availability but also cumulative contamination of water bodies and the resulting degrading quality.

Flood and stormwater management

Flooding and issues related to storm water management were noted by a number of interviewees as a growing issue in recent years. There was also a general sense that municipalities and developers should be able to do more with stormwater, specifically around re-use. The floods in 2013 remain fresh in the minds of stakeholders, and the related issue of reservoir and dam operation emerged as both a challenge and an opportunity to manage both flooding risks and resource availability.

Line of sight between provincial policies and local plans

There were comments on the importance of integrated provincial, municipal and local planning. This stemmed from challenges in implementing recommendations from Watershed Planning and Advisory Councils (WPACs) or Watershed Stewardship Groups (WSGs), due to a lag in provincial policy updates, or a lack of enablers in the legislation. Examples include policy around stormwater reuse and wetland management practices, which can contribute to minimising water stress and the enhanced protection of wetland areas.

Engagement findings

Common themes of discussion

Awareness of CMRB remit

Varying degrees of awareness regarding the CMRB, its role and ongoing work was observed among the interviewees. Some interviewees were previously in engagement with the Board, were well informed of its purpose and the intentions of updating the roadmap. For others however, the interview was one of the first engagements they have had with the CMRB and they were not informed of its ongoing work in the region. As such, the interviews themselves were appreciated as a good opportunity for familiarizing the stakeholders with the Board and initiating a discussion.

Thoughts on potential role

Interviewees were asked what role they believe CMRB could play most effectively around water-related matters. Thoughts on this varied, however generally all centred on its role as a mediator, coordinator and leader.

A reoccurring thought about CMRB's potential role in water-related matters was that CMRB is well positioned for facilitating collaboration among local stakeholders, the provincial government, WSGs, industries and service providers. Ensuring that all relevant stakeholders are engaged and have the opportunity to participate in discussions was highlighted, as it was felt that this is not the case in current governance structures.

It was noted that CMRB could leverage work already undertaken by watershed partnerships by bringing together existing work / information, collecting and shedding light on best practice and scaling this to other parts of the region. Coordinating and steering ongoing work and research can ensure there is consistency and efficiency within the region with regards to data availability and tools but also local plans and development expectations.

CMRB was perceived to be well positioned to take a leadership role within the region's water sector. There is potential for CMRB to "centralize the conversation" and act as a "regional voice" (Interview). In a role of leadership, CMRB can identify what are key issues and promote priorities of the region as a whole. It was noted that there is potential to attract investment and smooth regulatory challenges related to interpretation of the Water Act.

Lastly, it was noted that the CMRB can play an important role in raising awareness of water related issues across sectors, including the general public.

Appendix 3

Case Studies

Case studies

Investigate

Case Study 1: Regional water resource planning, UK

Context

There has been increasing recognition in the UK of the scale of action need to address long-term water supply risk. Localised droughts and water bodies under multiple pressures (extraction, pollution) produce supply deficits which are expected to increase with both climate change and increasing populations.



Action taken

In 2020 the Environment Agency (EA) published a [National Framework](#), establishing five regional Water Resource Groups (WRGs), with participation from water companies, local authorities, environmental groups, industries and other relevant and interested parties. The WRGs develop long-term regional water plans (on a 5-yearly cycle) incorporating a set of solutions across supply and demand. These plans in turn inform the relevant water companies' long-term water resource management plans. See for example: [South-East England Draft Regional Plan](#)

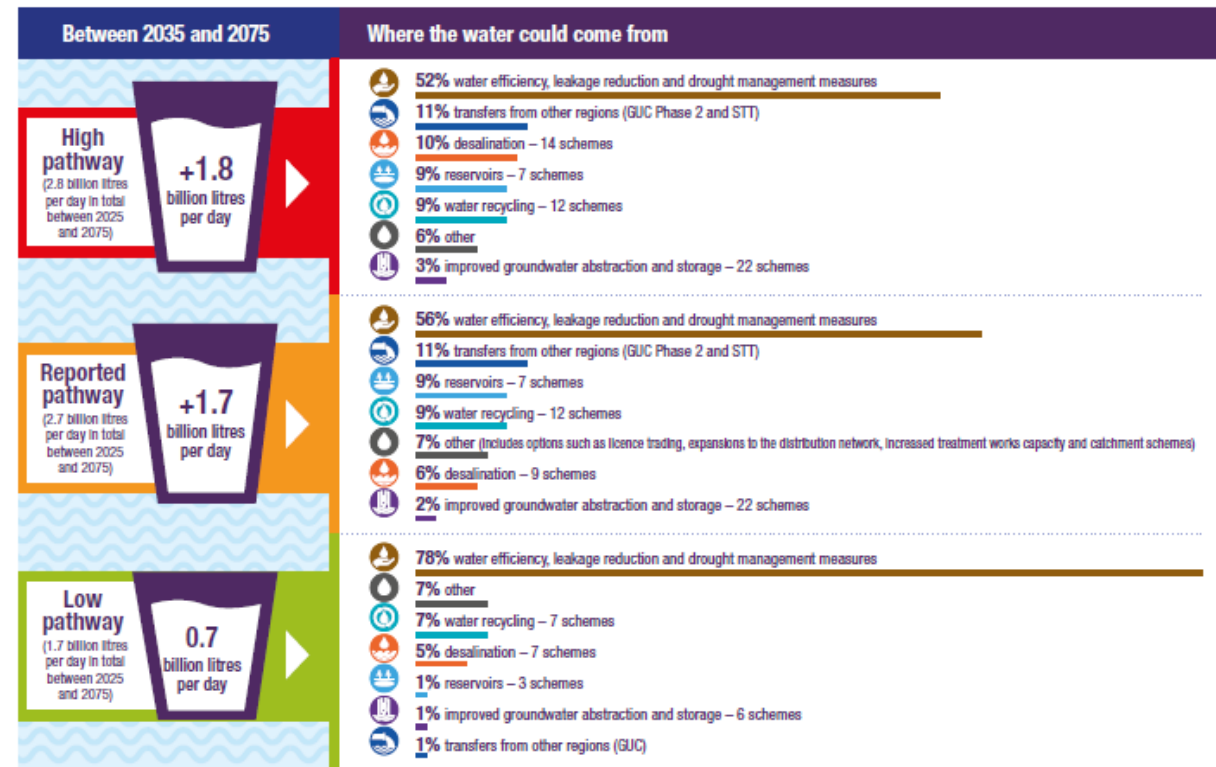
Stakeholder roles

WRG core members are from water companies and the EA, with additional members from Ofwat, the National Farmers' Union, Natural England, and adjacent WRGs. The EA / Natural Resources Wales and Ofwat, the economic regulator, are statutory consultees to the process.

Results

The plans are successful at bringing together stakeholders and producing a shared understanding of long-term water availability and use. Plans include details of any transfers expected or required between regions, and provide evidence to support investment in measures such as customer demand campaigns and supply infrastructure. The first set of plans were published in [draft for public consultation](#) in 2022.

South East England's future water supplies (2035 to 2075)



Source: [South-East England Draft Regional Plan](#)

Case studies

Investigate

Case Study 1: Regional water resource planning, UK

Context & stakeholder roles

Water Resources West is another example of a water resource group under the National Framework, responsible for 18 million people and some of the largest shared catchments in England and Wales: <https://waterresourceswest.co.uk/>

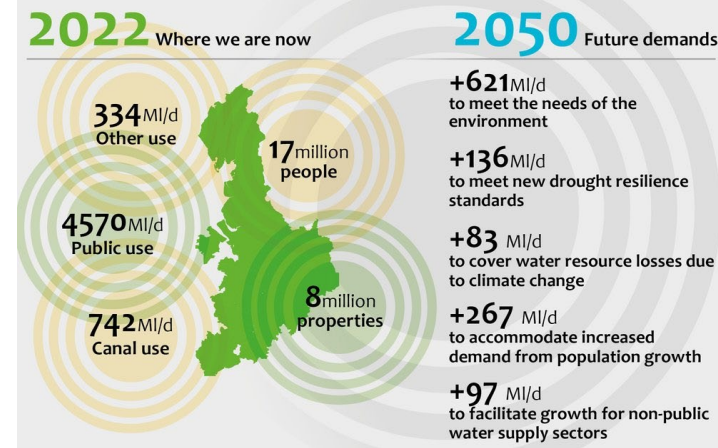
The region joins public supply areas provided by four different water companies, and a wide range of other abstractors including agriculture, chemicals sector, power generation, and food and drink producers. Producing the water resource plan involves stakeholder engagement and catchment prioritisation, as well as developing an understanding of whole-region hydrology and key catchment risks.

Action & Stakeholder roles

Water Resources West used an [ideastream website](#) to facilitate public consultation on the draft regional plan, and on other, specific issues such as non-public water supplies, water transfers and environmental needs and ambition. The consultation window was open for 14 weeks and included nine engagement events meeting with 183 attendees. Official feedback was gathered by key stakeholders such as regulators, local authorities, national park authorities, environmental, community groups and charities, business, trade associations, government and water company customers.

Results

WRW have used the consultation process (including the ideastream website) to produce an updated best value plan. In July 2023, WRW published a [statement of response](#) to the draft regional plan consultation, which shows responses to the feedback received, including any changes to be implemented in the final plan. This results in a regional planning process that is more transparent and robust, and therefore more trusted.



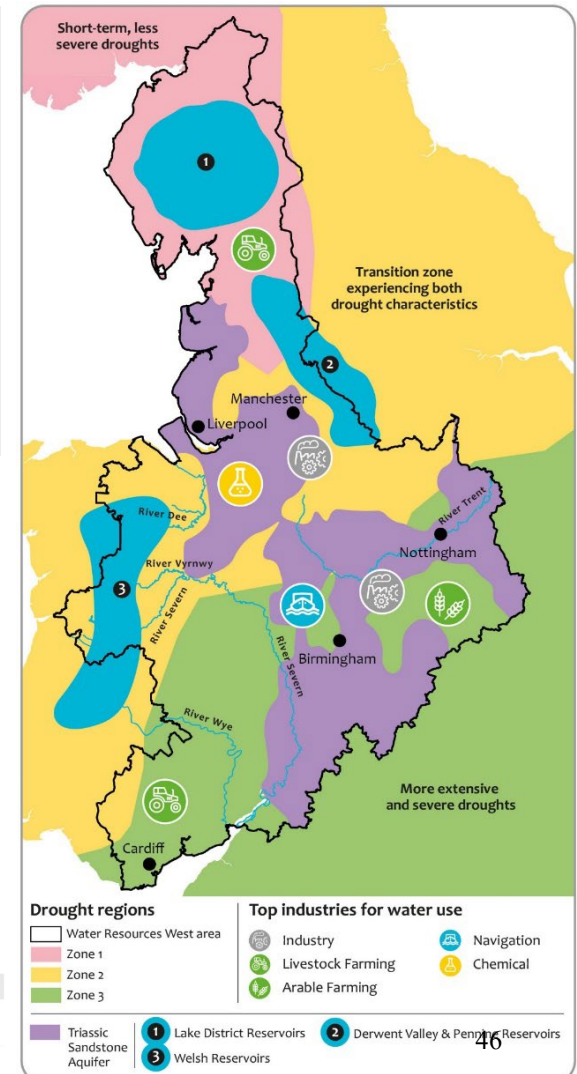
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Emerging Plan

Join the discussion in our Emerging Plan Forum on IdeaStream, bring your own ideas and collaborate with others. Let's change the future of water. If there are any additional questions or topics you would like to see us add to the forum, please get in touch and email us at waterresourceswest@outlook.com.

Topic	Voices	Posts	Last Post
Water Transfers	3	3	1 month, 2 weeks ago

Started by: Water Resources West



Case studies

Elevate

Case Study 2: Integrated Water Management in Sydney

Context

Greater Sydney is Australia's largest, global city, and is expected to almost double in population to 8 million people over the next 40 years. Enabling equitable growth within the region is essential. The region has identified priority growth areas and 'Directions' (including 'supportive infrastructure' and 'resilience') to guide this development.



Action taken

Under the guidance of the Greater Sydney regional plan, the Greater Cities Commission developed '[A Metropolis of Three Cities](#)' plan, which filters down through district and local plans to provide strategic vision for the priority growth areas. In the Western Sydney Aerotropolis area (a 36,000-hectare growth region near the airport), the region explored specifically how stormwater, wastewater, recycled water as well as trunk drainage and riparian zones should be managed.

Stakeholder roles

These plans were developed in coordination with the planning authority's urban planners and flooding consultants, and included extensive engagement with landowners, consultation with Councils and endorsement from various levels of NSW State Government.

Results

In consultation with the planning authority, the Aerotropolis area project has set out general water management objectives, performance criteria for development to preserve and enhance the region's waterways and riparian corridors, and the design approach to both infrastructure and water cycle management. At a wider scale, the Three Cities plan has enabled innovation in identified growth areas.

Elevate

Case Study 3: Integrated planning in Abu Dhabi

Context

Abu Dhabi is situated in an arid region and faced the dual challenge of rapid urbanization and water scarcity. A proactive and integrated approach to planning was taken by the government. The Abu Dhabi Master Plan aims to address said issues by combining land use and water management strategies.



Action taken

Mixed-use zoning and compact city design are promoted to optimize land use efficiency. Green building standards as well as energy-efficient design is enforced. Incentives for water-efficient practices for water use in residential, commercial and industrial sectors are set to reduce demand and increase productivity. Alternative water sources including rainwater harvesting, greywater recycling and desalination are incorporated. Comprehensive stormwater management strategies are incorporated that include retention ponds, permeable pavements, and green infrastructure to mitigate flood risks and recharge groundwater.

Stakeholder roles

The Plan is supported by a robust policy framework that facilitates effective implementation with regulatory measures, incentives, and coordination mechanisms to ensure compliance. The public are engaged through awareness campaigns, educational programs, and community initiatives. Industry and academia are engaged to leverage expertise, innovation, and research capabilities.

Results

This holistic approach and interdisciplinary collaboration has resulted in enhanced water security, improved resilience to climate change, economic benefits and job creation.

Case studies

Campaign

Case Study 4: National water campaign in Israel

Context

Israel is known for its arid climate and limited water resources. Faced with a growing population and increasing water scarcity, the government undertook a comprehensive national campaign to promote water efficiency and create a water-conscious society. Extensive public awareness campaigns on diverse media channels were developed along school and community programmes.



Action taken

Awareness campaigns employed numerous channels, including television, radio, social media, and outdoor advertising. They aimed to educate citizens about the importance of water conservation, provide practical tips for water-saving behaviours and promote behavioural change among sectors. Furthermore, water conservation was integrated in education curricula, empowering students to become water stewards.

Stakeholder roles

The government played a crucial role by formulating policies, regulations, and incentives, and allocated financial resources. Non-governmental organizations (NGOs), environmental groups, and industries collaborated by organizing events, supporting research and development.

Results

Israel's water usage per capita is one of the lowest among developed countries, reflecting the success of the campaign to effectively educate the population about water scarcity, efficient water usage, and the importance of conservation. This resulted in a shift in societal norms, with water-conscious behaviour becoming more prevalent.

Campaign

Case Study 5: Being Waterwise in Auckland, NZ

Context

The Auckland Region is the most populous in New Zealand and growing. Water supply is stable under current supply and demand balances, but projected growth, climate change and source water quality challenges place this under pressure. Water is managed and delivered by a Council-controlled organisation, Watercare.



Action taken

Watercare have produced a water efficiency strategy, which charts out the steps taken to maximise water efficiency, from leakage reduction, network pressure optimisation and reduced household consumption. In the summer months, when risks of drought are higher, Watercare report on 7-day rolling averages of use using a speedometer-style system. Watercare also report on dam levels in the wider Auckland region, with a live website showing per cent full and overall storage. These two communication tools are brought together in a Water for Life campaign that also includes billboard and media advertising.

Stakeholder roles

Ultimately Watercare is the owner of long-term water resilience in the region, and therefore produce and develop the plans and media campaigns. They do this through extended engagement with the community, particularly by connecting with schools to encourage children to be water guardians, and local Indigenous tribes to learn and co-design local water efficiency solutions.

Results

Auckland faced a significant drought in the summer of 2019 / 2020, which brought water efficiency and availability to the forefront of the community. These extended campaigns, and an understanding by the public of the importance of using water carefully meant supply disruptions were limited.

Case studies

Elevate

Case Study 6: Integrated Water Management for the Greater London Authority

Context

The Royal Docks and Beckton Riverside is identified as an Opportunity Area (OA) in the London Plan 2021. OAs are significant locations with development opportunities to accommodate new homes, jobs and infrastructure (of all types). Water presents a risk to the delivery of development in London, due to flooding, stormwater management, water quality, water supply for homes and industry. This is true of the Royal Docks and Beckton Riverside Opportunity Area. The driver for a Royal Docks and Beckton Riverside Integrated Water Management Strategy (IWMS) is to support good growth in the Royal Docks and Beckton Riverside area and offer a response to the climate emergency.

Action taken

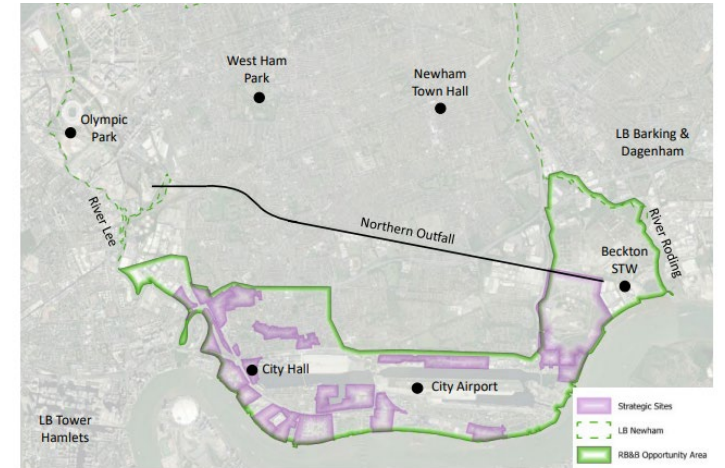
After an initial baseline review of existing land-use, flood risk and anticipated water demand, several scenarios were modelled to understand the water balance in the OA under different conditions and to test the relative impact of different approaches towards meeting the IWMS ambitions. These scenarios began with a long list of interventions that included runoff reduction measures (through both blue-green infrastructure and hard engineering), digital analytics (e.g. bulk metering and smart tariffs to manage demand), and water resource management through greywater reuse and rainwater harvesting.

Stakeholder roles

The project was guided with the help of a Steering Group comprising representatives from: Greater London Authority, London Borough of Newham, Environment Agency, Thames Water and Royal Docks Management Authority. The project work including scenario modelling was completed by Arup, grounding an IWMS systems-based approach in Arup's Design with Water framework.

Results

The IWMS provides a holistic and integrated assessment of future water demand scenarios, flood risk, and water infrastructure including water supply, foul and surface water drainage. Crucially, it provides a framework to support the planning process and activities of infrastructure providers, such as water companies and developers. Key results of the project are shared ambitions for the area, and a monitoring strategy to ensure the recommended interventions are being implemented and are producing the desired effects.



Map showing the OA boundary and strategic sites



Arup's Design with Water framework, which supports an outcomes-led and place-based approach.

Appendix 4

Reference detail of growth and servicing plans

Growth plan – objectives of regional policy 1/2

Approved 2024 02 09



Regional policy area	Sub-section	Objectives
3.1 Blueprint for growth		(a) Create opportunities for each municipality to grow and develop in a way that contributes to balanced regional growth. (b) Promote a range of housing and neighbourhood types within each municipality. (c) Strengthen the importance and livability of existing urban and rural centres. (d) Provide adequate land area for a variety of employment opportunities in appropriate areas. (e) Focus future urban growth in suitable locations where land use, infrastructure and servicing are aligned. (f) Promote compact and walkable communities. (g) Reduce the amount of land consumed by achieving higher densities and more efficient and mixed-use development patterns. (h) Limit or discourage new auto-oriented residential communities that are dominated by single-detached housing with limited amenities. (i) Encourage country residential development in a clustered form of development which promotes land conservation for ecological and open space purposes. (j) Reduce the cost of infrastructure to support growth compared to past practices. (k) Focus regional service delivery in areas that take advantage of existing services, collaboration and plans
3.2 Economic wellbeing		(a) Diversify the economy in the CMR, supported by creating more resilient, efficient, and livable communities. (b) Enable transit, walking and cycling to work, which will contribute to attracting and retaining workforce. (c) Provide an effective transportation network, assuring efficient transportation of goods to market. (d) Ensure adequate suitable land for emerging market demand, providing capacity for economic growth. (e) Build on the strengths of all member municipalities to create a plan for economic growth in the Region. (f) Collaborate among municipalities and with industry partners
3.3 Protect and enjoy the environment	Flood prone areas	(a) Increase awareness and understanding of natural and sensitive areas through Environmentally Sensitive Area mapping. (b) Preserve the function of Regionally Significant natural systems. (c) Plan responsibly in Flood Prone Areas through sensitive development and flood mitigation. (d) Reduce the Region’s impact on the environment and climate through proper and efficient land use planning, including the use of measurable targets to reduce impacts on land, water and air. (e) Increase the environmental, economic, and social resiliency of our region
	Environmentally sensitive areas	
	Climate change	
3.4 Water stewardship	Watershed protection	(a) Enhance protection of our watersheds and natural water systems. (b) Provide a safe, affordable, and reliable supply of drinking water for residents and businesses. (c) Enhance regional collaboration of water stewardship. (d) Enhance the Region’s resilience to changes to natural water systems, due to Climate Change and human development. (e) Improve the efficiency with which we use our limited water supply. (f) Advance opportunities to better manage and share the risks and costs of water, wastewater and Stormwater infrastructure and service delivery. (g) Enhance protection of Regionally Significant Source Waters
	Stormwater management	
	Water efficiency	
	Collaboration of governance	

Growth plan – objectives of regional policy 2/2

Approved 2024 02 09



Regional policy area	Sub-section	Objectives
3.5 Shared services optimisation	Transportation and transit corridors	(a) Promote future opportunities to share Regional Infrastructure and services. (b) Coordinate regional land use planning with service provision and planning. (c) Achieve servicing efficiencies through a conscious effort to share infrastructure and services
	Energy & utilities corridors	
	Planning and protection for regional corridors	
	Recreation	
3.6 Quilt of urban & rural		(a) Provide policy tools to create a diverse range of urban and rural places for people to live, work and play. (b) Establish agricultural, environmental, and open space areas as integral components of our regional system to be conserved
3.7 Truth & reconciliation		

Growth plan – regional policies 1/2

Approved 2024.02.09



Regional policy area	Sub-section	Specific / relevant policies (abridged)
3.2 Economic wellbeing	3.2.3 Agricultural economy	<p>3.2.3.1 Municipal Development Plans shall: (a) identify the role that Agriculture plays in the municipality and include policies to support a strong, resilient and diversified agricultural economy; (b) include policies to support growth of AgriBusiness and value-added Agriculture and related industries, especially when located in proximity to Producers, as appropriate to the local scale and context;</p> <p>3.2.3.2 As part of a broader approach to regional economic development, the CMRB shall work with regional economic development partners, learning institutions, and other agricultural specialists to: (a) establish areas of focus where the CMRB can use its mandate to support the growth and diversification of the Agriculture industry and local Agricultural Value Chains; (b) identify inventories, gaps and priorities for the improvement of infrastructure assets critical to the agricultural sector; and (c) identify areas where Agricultural Production and Processing are important or dominant land uses and coordinate those areas with necessary infrastructure and services</p>
3.3 Protect and enjoy the environment	3.3.1 Flood prone areas	<p>3.3.1.1 No new development shall be permitted within a provincially identified Floodway, with the exception of uses with no permanent buildings, such as Agriculture, natural areas, outdoor recreation, parks, roads, bridges, utilities, aggregate extraction, and flood mitigation infrastructure.</p> <p>3.3.1.2 Development in provincially identified Flood Fringe areas shall include flood protection measures to mitigate risk at the 1:100 year flood event level.</p> <p>3.3.1.3 New Area Structure Plans for Greenfield Developments must include cumulative protection measures to mitigate flood damage risk in Flood Hazard Areas at the 1:200 year food event level up to the limits of the Flood Fringe.</p> <p>3.3.1.4 After updated provincial flood hazard mapping is finalized, the CMRB shall work with the Province of Alberta and member municipalities to investigate changing the provincial definition of the flood hazard area to the 1:200 year level, including an assessment of the impacts to Alberta’s Disaster Relief Program and private insurance.</p>
	3.3.2 Environmentally sensitive areas	<p>3.3.2.3 Municipal Development Plans shall include policies that address Environmentally Sensitive Areas as appropriate for the scale and context of the municipality.</p> <p>3.3.2.4 The CMRB shall compile the municipally identified Environmentally Sensitive Areas into a common database for the Region.</p>
	3.3.3 Climate change	<p>3.3.3.1 Municipal Development Plans shall address Climate Change resiliency, which will include: (a) a commitment to reduce municipal greenhouse gas emissions and water consumption; and (b) policies to identify and mitigate risks within the municipality due to Climate Change</p>
3.4 Water stewardship	3.4.1 Watershed protection	<p>3.4.1.1 The CMRB will continue to advocate for enhanced protection of the headwaters of rivers that the CMR relies on for drinking water and economic production that are located inside and outside the CMR.</p> <p>3.4.1.2 The CMRB will support the continued assessment of upstream reservoirs on the Region’s rivers to provide water storage capacity and flood mitigation, where applicable.</p> <p>3.4.1.3 CMRB member municipalities shall coordinate to manage impacts to Source Water quality in Regionally Significant Source Watersheds</p>

Growth plan – regional policies 2/2

Approved 2024.02.09



Regional policy area	Sub-section	Specific / relevant policies (abridged)
3.4 Water stewardship	3.4.2 Stormwater management	<p>3.4.2.1 The CMRB will provide regional leadership for the management of Stormwater for Regionally Significant Stormwater issues.</p> <p>3.4.2.2 The CMRB and member municipalities should identify locations where Stormwater management may impact Regional Infrastructure systems and develop appropriate policies to address areas of impact.</p>
	3.4.3 Water efficiency	<p>3.4.3.1 The CMRB shall work with the Province to advance initiatives that improve the Region’s ability to sustainably use and reuse water.</p> <p>3.4.3.2 CMRB Members should collaborate to identify higher and consistent water efficiency standards across the Region</p>
	3.4.4 Collaboration of governance	<p>3.4.4.1 CMRB Members should investigate approaches to water collaboration within the CMR at the regional and sub regional scales, as appropriate.</p>
3.5 Shared services optimisation	3.5.1 Transportation and transit corridors	<p>3.5.1.3 Municipalities shall coordinate regional active transportation and recreation corridors with local transportation, mobility, transit, and recreation corridors to maximize their use.</p>
	3.5.2 Energy & utilities corridors	<p>3.5.2.1 Statutory plans shall: (a) identify any Regionally Significant corridor(s) on relevant maps within the Statutory Plan as appropriate to the scale and context; and (b) describe how impacts on the corridor(s) will be mitigated.</p>
	3.5.3 Planning and protection for regional corridors	<p>3.5.3.2 When regional infrastructure corridors have been identified, municipalities shall identify and protect regional infrastructure corridor alignments in statutory plans and through municipal planning processes.</p> <p>3.5.3.3 Municipalities should plan for multi-use corridors through future studies and initiatives including, but not limited to, Context Studies for JPAs, transportation and transit studies or plans, Working Groups, as appropriate.</p>
	3.5.4 Recreation	<p>3.5.4.1 CMRB municipalities may work together to provide residents of the Region with high-quality recreational opportunities that are delivered in a cost-effective manner</p>
3.6 Quilt of urban & rural		
3.7 Truth & reconciliation		<p>3.7.1.1 The CMRB will seek to build meaningful and mutually beneficial long-term relationships with Indigenous Nations and communities in and around the Region</p>

Growth plan – Preferred Placetypes

Regional Policies: A blueprint for growth

3.1.2 Preferred Placetypes

The Preferred Placetypes are development forms that, when used as the dominant development forms, improve environmental and fiscal outcomes and create opportunities for efficient infrastructure and servicing. Their use is key to the Growth Plan and should be used in all Preferred Growth Areas.

Policies

3.1.2.1 The Preferred Placetypes shall consist of the following three Placetypes:

- Infill and Redevelopment,
- Masterplan Communities,
- and Mixed-use/TOD.

The Preferred Placetypes shall be planned and developed as complete communities that provide:

- a) compact, contiguous development that makes efficient use of infrastructure and services;
- b) a diverse mix of housing types;
- c) Density in accordance with the associated Placetype definitions;
- d) interconnected street network and urban form to support active transportation and transit;
- e) access to local services, neighbourhood amenities, and commercial uses;
- f) access to local institutional and recreational services and/or enabling use of existing regional facilities in other municipalities where municipal agreements are in place; and
- g) high quality parks, trails and open spaces that connect to regional trails where appropriate

Servicing plan 1/2

Three pillars of the servicing plan:

Pillar 1: Servicing priorities	Pillar 2: Working groups	Pillar 3: Evidence based decision making
Understanding the regional servicing system and identifying areas where collaboration will provide regional benefit	Creating approaches to collaboration through use of Working Groups	Ensuring that data collection, reporting and monitoring are undertaken to support decisions.

Servicing areas:

Transport and transit	Long term water strategy	Water and wastewater servicing	Stormwater management	Recreation
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Servicing plan priorities 2/2

Transport and transit	Long term water strategy	Water and wastewater servicing	Stormwater management	Recreation
<p>3.2.1 Region-Wide Priorities</p> <p>3.2.1.3 TRANSPORTATION AND UTILITY CORRIDORS • Optimize the use of major transportation corridors by co-locating other utilities and services, where appropriate.</p> <p>3.2.2 Preferred Growth Areas Priorities</p> <p>3.2.2.1 JOINT PLANNING AREA CONTEXT STUDIES Use Context Studies, local transportation master plans, Transit Background Report and the North, and South and East Calgary Regional Transportation Studies (and Integration Memorandum) to build a better understanding of regional corridors, demand, servicing systems and other key considerations in Joint Planning Areas</p>	<p>4.2.1 Region-Wide Priorities</p> <p>4.2.1.1 WATERSHED PLANNING</p> <ul style="list-style-type: none"> • Determine how the CMRB can contribute to and integrate with regional watershed planning. <p>4.2.1.2 WATER USE AND EFFICIENCY</p> <ul style="list-style-type: none"> • Identify opportunities to improve water efficiency through regional collaboration <p>4.2.1.3 ADVOCACY</p> <ul style="list-style-type: none"> • Identify common regional issues for advocacy with the Province <p>4.2.2 Preferred Growth Areas Priorities</p> <p>4.2.2.1 OPPORTUNITY FOR LEARNING</p> <ul style="list-style-type: none"> • Incorporate lessons learned through planning in the Joint Planning Areas into the Region’s long-term water strategy 	<p>5.2.1 Region-Wide Priorities</p> <p>5.2.1.1 REGIONAL UTILITY SYSTEM</p> <ul style="list-style-type: none"> • Assess opportunities for shared servicing at the regional level based on findings and lessons learned through Context Studies and at the sub-regional level <p>5.2.2 Preferred Growth Areas Priorities</p> <p>5.2.2.1 SUB-REGIONAL SERVICING</p> <ul style="list-style-type: none"> • Evaluate opportunities for servicing collaboration through planning in the Preferred Growth Areas. 	<p>6.2.1 Region-Wide Priorities</p> <p>6.2.1.1 STORMWATER USE AND WATER REUSE</p> <ul style="list-style-type: none"> • Advocate for Stormwater use <p>6.2.1.2 REGIONAL INITIATIVES</p> <ul style="list-style-type: none"> • Lead collaboration at the regional and sub-regional levels to improve Stormwater management. <p>6.2.2 Preferred Growth Areas Priorities</p> <p>6.2.2.1 CONTEXT STUDIES FOR JOINT PLANNING AREAS</p> <ul style="list-style-type: none"> • Initiate Stormwater management collaboration in Preferred Growth Areas 	<p>7.2.1 Region-Wide Priorities</p> <p>7.2.1.1 REGIONAL COLLABORATION • Collaborate to realize mutually agreed upon outcomes.</p>