North Saskatchewan Region Surface Water Quality Management Framework

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Alberta Environment and Parks

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Announcement

- In June 2021, Minister Nixon announced a Water Action Plan

NATIONAL POST

PMN Politics / PMN News / PMN Life / PMN Health / PMN Canada

Alberta moving forward on two new plans to maintain river water quality

THE CANADIAN PRESS

The Canadian Press

Jun 22, 2021 • June 22, 2021 • 1 minute read • Join the conversation

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Engagement: June to September 2021

North Saskatchewan Region Surface Water Quality Management Framework

A surface water quality management framework (framework) is being developed for the North Saskatchewan Region. The framework establishes an approach for monitoring and managing the cumulative impacts of human activities on water quality in the North Saskatchewan and Battle rivers. Cumulative effects management was first introduced in the North Saskatchewan Region with the Water Management Framework for the Industrial Heartland and Capital Region, which was developed in 2008 to address anticipated development in the Capital Region. At that time, government and stakeholders committed to maintaining or improving surface water quality in the stretch of the North Saskatchewan River from Devon to Pakan. Stakeholder and indigenous engagement on a Surface Water Quality Management Framework began in 2015 as a component of the North Saskatchewan Regional Plan, and continued in 2018. The current engagement will build on these initiatives and processes.

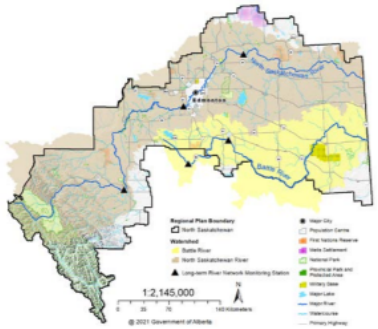


Figure 1: The North Saskatchewan and Battle River Watersheds

Surface Water Quality Pressures

Rivers in the North Saskatchewan Region are relied upon for source water for drinking, livestock watering, recreation, industry, providing healthy aquatic habitat and supporting traditional land use activities. However, pressure from different human activities can impact surface water quality in the region.

Population growth drives urban development, recreational growth, industrial growth and intensification of agricultural operations. All of these activities, individually and in combination, contribute to increased loadings of point source and non-point source pollutants. Nutrients are one type of pollutants from, for example, agricultural run-off or wastewater treatment facilities, which can lead to increased aquatic plant growth, causing changes in the flora and fauna of a river system.

Surface Water Quality Status

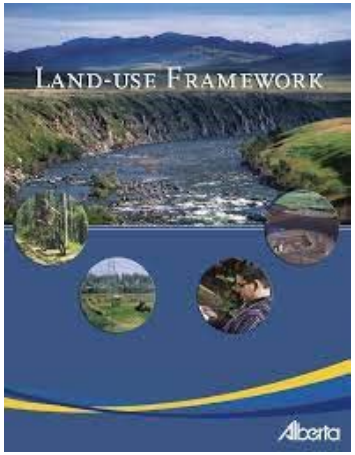
Many aspects of water quality in the North Saskatchewan Region have improved in recent decades due to improved management practices, especially wastewater treatment. Despite these advances, concerns for water quality in the North Saskatchewan and Battle rivers include low dissolved oxygen in the winter, nutrient enrichment, trace metals, and high sedimentation. Continuing efforts under the Water Management Framework for the Industrial Heartland and Capital Region are working to address these issues.

Low flow rates, a natural characteristic of the Battle River, may result in low pH, and high bacterial counts and nutrient concentrations. These sometimes exceed provincial water quality guidelines. This is a prairie-fed river system that relies on precipitation and groundwater to feed the river, so there is less dilution and flushing of human-made wastes.

- Online survey
- Webinar with Q&A
- Indigenous engagement
- Stakeholder engagement

https://www.alberta.ca/north-saskatchewan-region-surface-water-quality-management-engagement.aspx

Cumulative Effects Management



2008

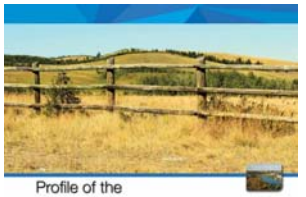
- **Cumulative effects** are the combined effects of past, present and reasonably foreseeable land-use activities, over time, on the environment.
- Commitment to manage cumulative effects through the development of "**thresholds, measurable management objectives, indicators and targets**" at regional scale
- Regional **environmental management frameworks** are a key component of Alberta's cumulative effects management system under the Land-use Framework.

Current and ongoing policy direction & initiatives

Water Management Framework for the Industrial Heartland Capital Region

Water for Life: a renewal

Land Use Framework



Profile of the North Saskatchewan Region

Recommendations Document from the North Saskatchewan Regional Advisory Council

Profile of the North Saskatchewan Region

2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

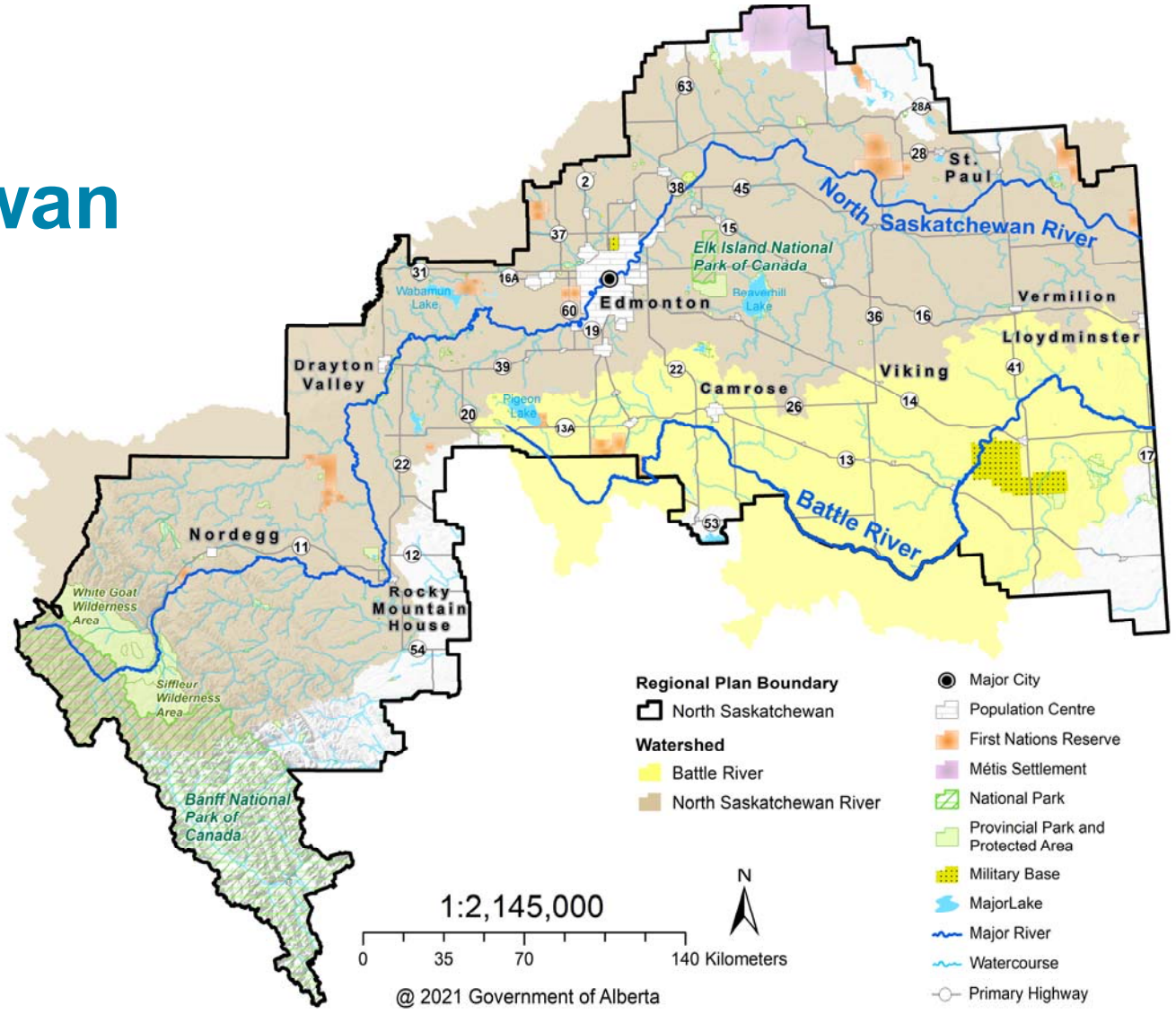
Water for Life

Previous Engagement:
NSR Surface Water Quality Management Framework

Ongoing: 2008 – Present
Engagement with the Capital Region – Industrial Heartland Water and Air Advisory Committees

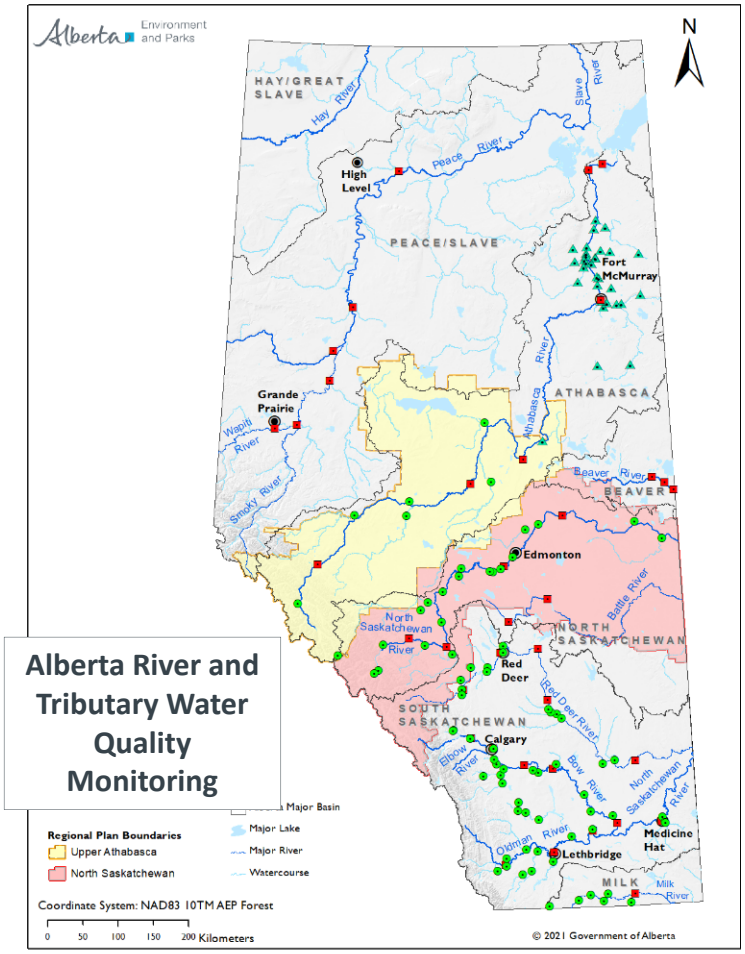
A **surface water quality management framework** establishes an approach to monitoring and managing long-term cumulative impacts of human activities on water quality in the mainstem rivers in a region

North Saskatchewan Region



Alberta Environment and Parks staff collect river water samples and test them for nutrients, metals, bacteria, pesticides, etc.

Surface water quality is monitored through Alberta Environment and Parks' long-term river and tributary monitoring networks

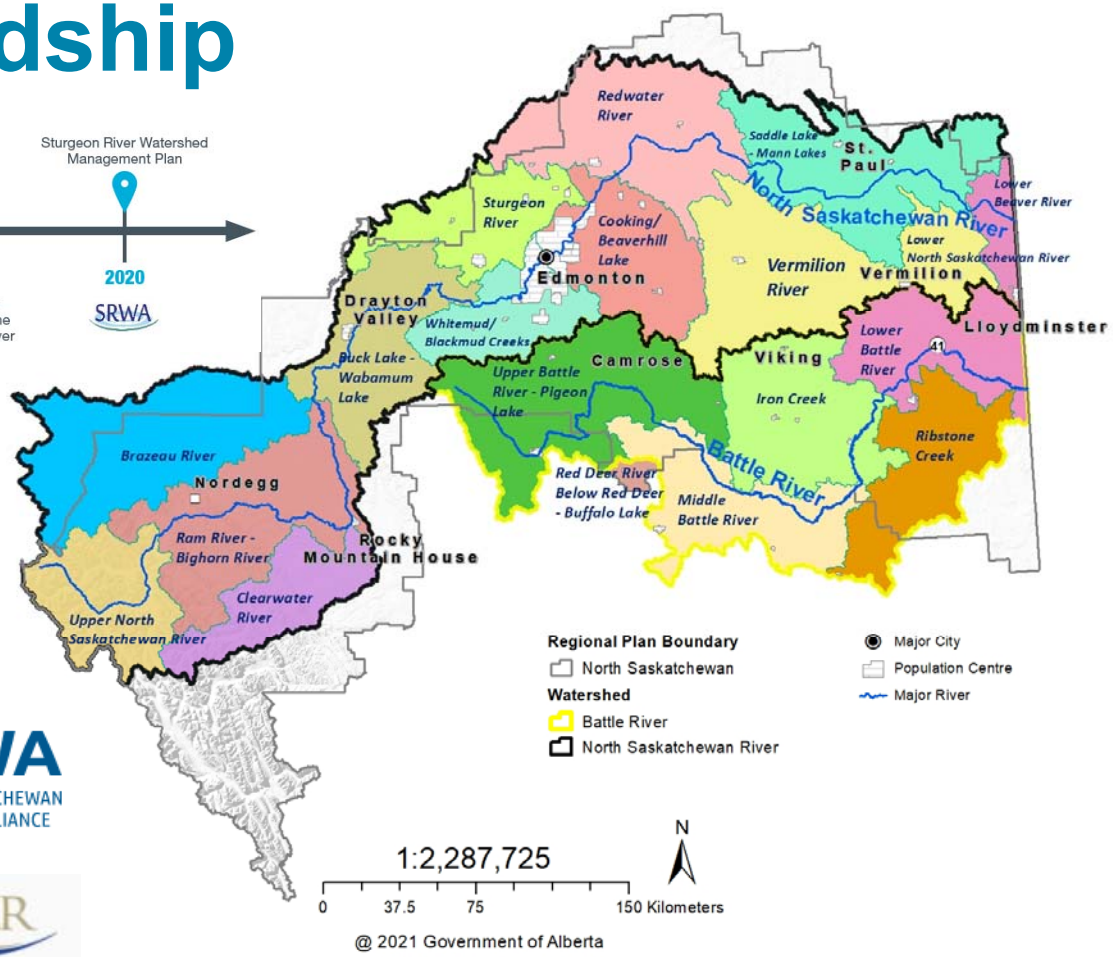


Alberta River and Tributary Water Quality Monitoring

Informed by long-term Surface Water Quality Monitoring in Alberta

Map: https://www.battleriverwatershed.ca/wp-content/uploads/2018/11/NorthSaskMap.jpg

Watershed Stewardship

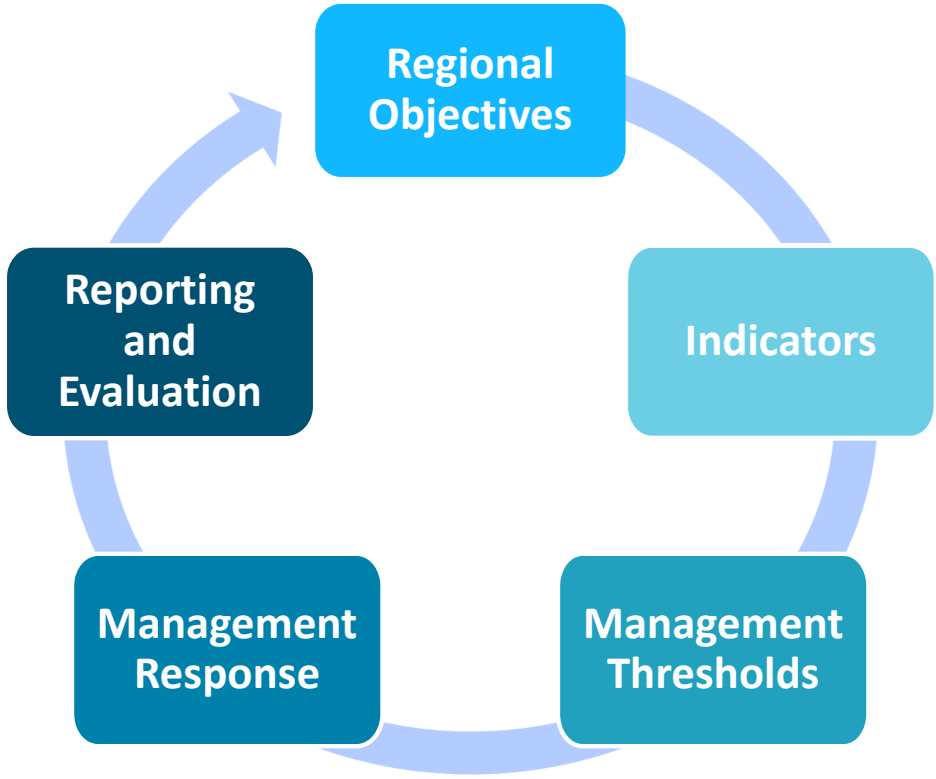


NSWA
NORTH SASKATCHEWAN WATERSHED ALLIANCE

BATTLE RIVER
WATERSHED ALLIANCE

What will the framework do?

- Establish a regular cycle of monitoring, evaluating, reporting water quality conditions at the regional-scale
- Create a clear process to respond to current or emerging water quality issues in the river
- Set indicators and thresholds to support achievement of regional objectives
- Require that decision makers consider the findings from the framework reporting in land and natural resource decisions



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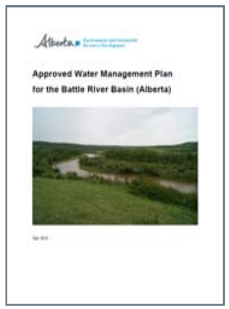
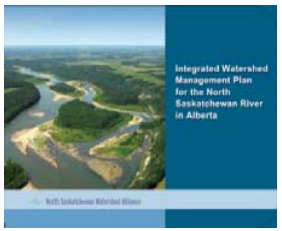
Proposed Regional Objective

Surface water quality in the North Saskatchewan and Battle rivers is managed so current and future water quality is maintained or improved.

- Consistent with direction for Industrial Heartland and Capital Region



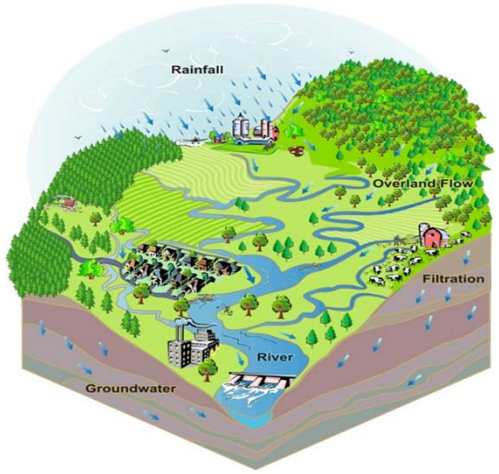


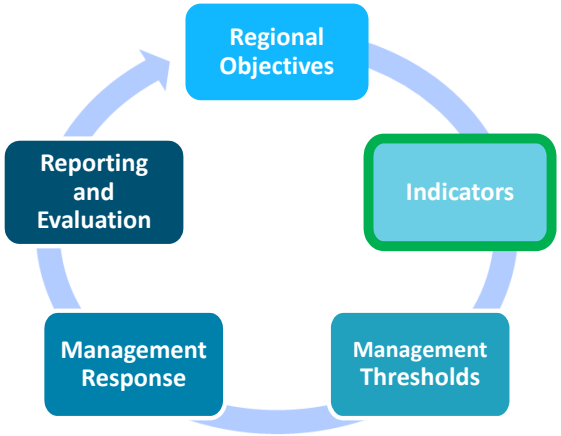
Indicators

– Identify **water quality indicators** that will used to assess water quality conditions

North Saskatchewan River proposed indicator list:

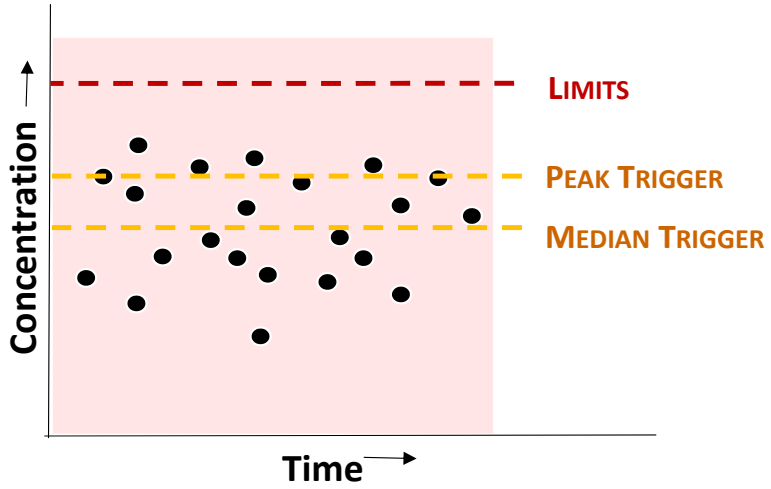
Total Ammonia	Total Arsenic
Chloride	Total Cadmium
Fluoride	Total Cobalt
Total Nitrate + Nitrite	Total Copper
Total Dissolved Phosphorus	Total Lead
Total Phosphorus	Total Mercury
Sulphate	Total Selenium
Sodium	Total Zinc
Total Suspended Solids	2,4-D (2,4-Dichlorophenoxyacetic acid) **(secondary)**
Total Organic Carbon	
Escherichia coli	





Proposed Thresholds

- Seasonal median and 90th percentile triggers
- Limits based on Alberta's water quality guidelines



- **Limits –** are levels at which the risk of adverse effects on environmental quality is unacceptable;
- **Triggers** are set in advance of limits as early warning signals

Appendix: Draft indicators, triggers and limits for the Battle and North Saskatchewan rivers

Table 1. Draft indicators, triggers and limits applied at the Battle River at Highway 53 and Driedmeat Lake monitoring stations

Indicator	Unit[a]	Season	Limit[b]	Median Trigger		Peak Trigger	
				Hwy 53	Driedmeat Lake	Hwy 53	Driedmeat Lake
BIOLOGICAL							
Escherichia coli	no/100ml	open	100	20	10	180	64
		winter	100	10	10	30	30
IONS							
Chloride	mg/L	open	100	8.1	32	13	72
		winter	100	9.0	75	16	200
Sodium	mg/L	open	-	48	72	78	120
		winter	-	82	160	140	280
Sulphate	mg/L	open	Equation	22	76	47	160
		winter	Equation	34	200	40	470
METALS							
Arsenic (total)	µg/L	open	5	2.31	3.12	5.70	7.42
		winter	5	1.20	2.56	7.26	4.81
Iron (dissolved)	µg/L	open	300	105	60.8	387	281
		winter	300	39.7	22.8	476	222
Lead (total)	µg/L	open	Equation	0.257	0.505	0.528	3.16
		winter	Equation	0.237	0.528	2.48	1.63
Mercury (total)	ng/L	open	5	2.21	3.09	6.59	15.5
		winter	5	0.985	1.60	14.5	4.15
Selenium (total)	µg/L	open	2	0.28	0.54	0.56	1.5
		winter	2	0.29	1.1	2.4	2.5

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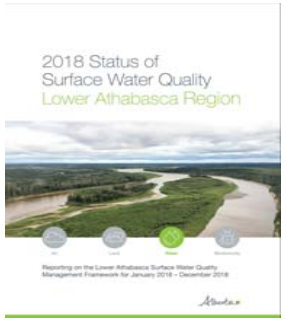
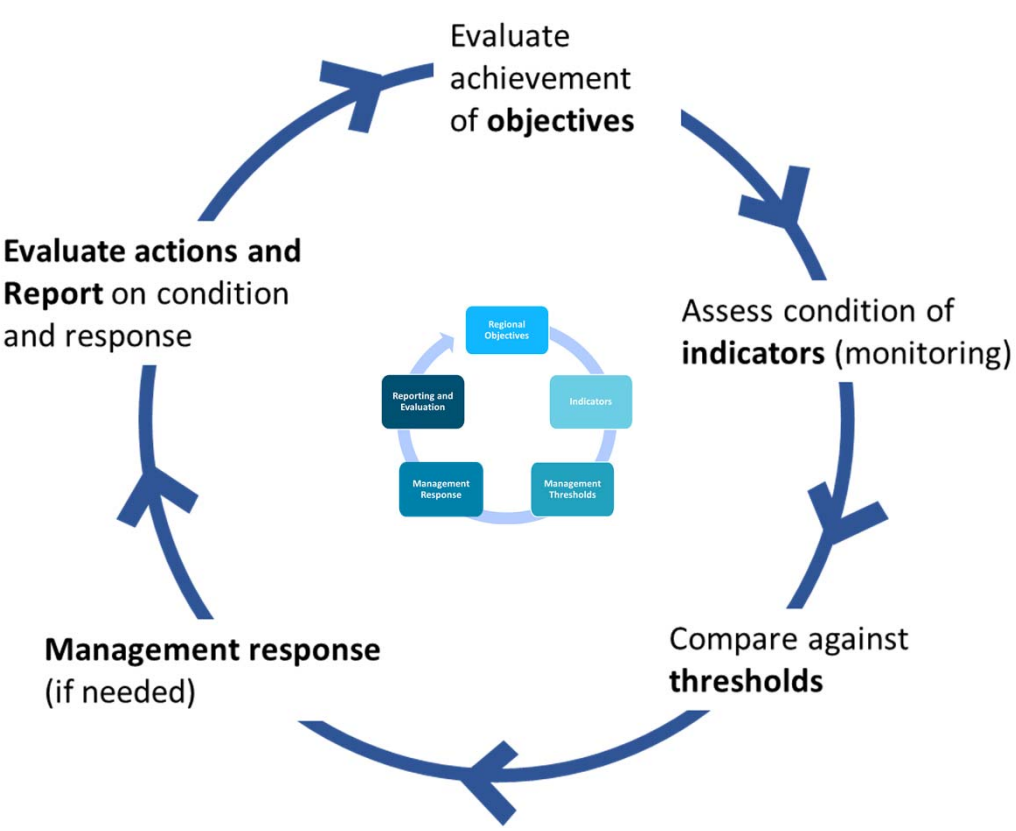
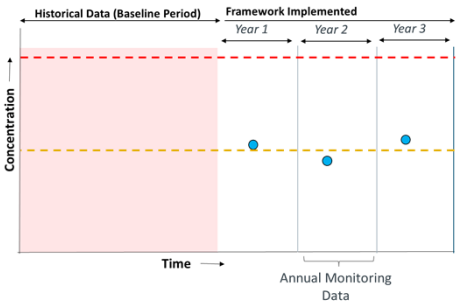
Annual Framework Implementation Cycle





Level	Description	Management Intent
3	Water quality limit has been exceeded.	Management actions required to improve ambient water quality to below limits, using regulatory tools and/or non-regulatory approaches as required. Minister to issue Notice Respecting Limits, as per Regulatory Details of the regional plan.
	Limit	
2	A trigger has been exceeded and preliminary assessment determines that an undesirable trend is occurring.	Investigation of cause is initiated to inform the development and implementation of management actions to improve ambient water quality to be at or below trigger. Regulatory tools and/or non-regulatory approaches are used as required.
	Trigger	
1	Indicator seasonal median and peak water quality conditions are at or better than baseline water quality conditions.	Maintain regulatory and non-regulatory approaches currently in place to manage water quality to maintain or improve conditions.



Management Response

– The **management response** process is a clear steps that will be followed if management thresholds (e.g. triggers, limits) are exceeded

Management Level	Description
3	Water quality limit has been exceeded
	Limit
2	A trigger has been exceeded and undesirable trend or issue is developing
	Trigger
1	Condition are at or better than historical conditions

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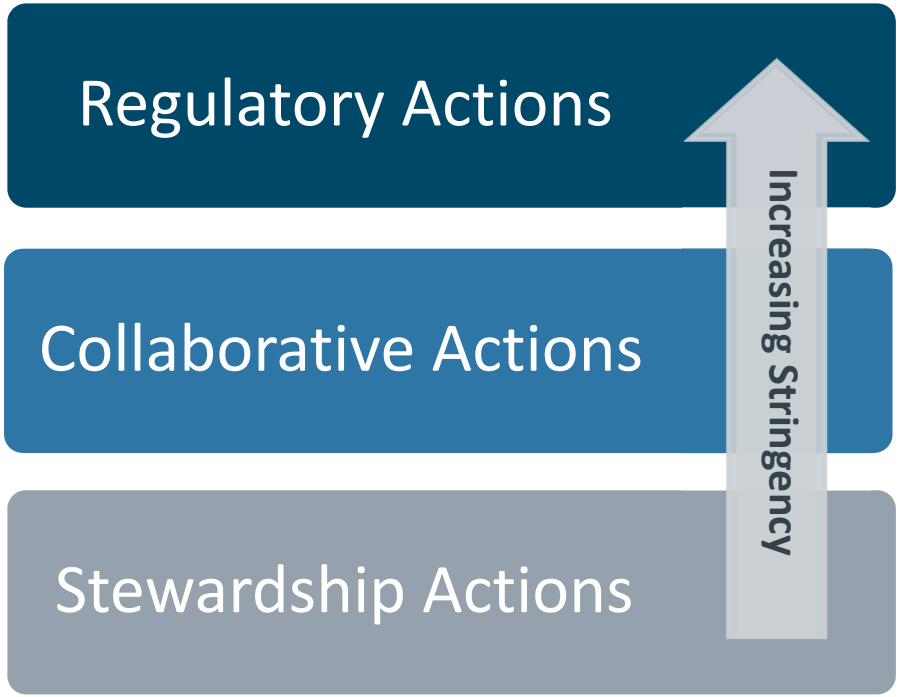
Investigation

- Investigation will seek to identify the source of the issue; may focus on a specific sub-watershed
- The investigation may draw upon additional data sources, for example:
  - Tributary monitoring information from the WaterSHED program
  - Data from partners, community based monitoring

Management actions

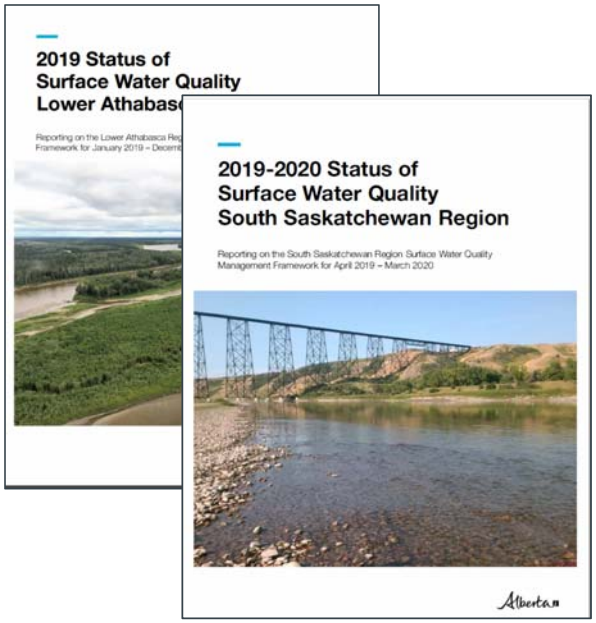
- Management actions can range from education and stewardship to regulatory change
- More stringent actions are taken if a limit is approached or exceeded



AEP Reporting

Available on:

- https://www.alberta.ca/lower-athabasca-regional-planning.aspx
- https://www.alberta.ca/south-saskatchewan-regional-planning.aspx
- Open.Alberta.ca



Status of Condition Reports (annual)

Status of Management Response (every two years)

Next steps

- Input received through engagement is being used to inform framework drafting
- Approval will be sought by Spring 2022, for framework implementation in 2022.
- First reports will be available in 2023, reporting on the 2022 data.

Thank you

More information:
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