



Alberta Capital Region Wastewater Commission

Wet Weather Flow Management Strategy

September 2014

Acknowledgements

The Alberta Capital Region Wastewater Commission (ACRWC) acknowledges the time and effort its thirteen member municipalities and the City of Edmonton have generously contributed to the development of this Strategy.

Initial Strategy Prepared by: Urban Systems – July, 2014

The Wet Weather Strategy is a living document. It will be updated from time to time by the ACRWC to reflect progress and changing conditions.

Wet Weather Flow – A Regional Issue

The Alberta Capital Region Wastewater Commission (ACRWC) provides wastewater transmission and treatment services to the following 13 municipalities in the Alberta Capital Region:

Parkland County	Leduc County
Town of Bon Accord	City of St. Albert
Town of Beaumont	City of Spruce Grove
City of Fort Saskatchewan	Town of Stony Plain
Town of Gibbons	Strathcona County
Town of Morinville	Sturgeon County
City of Leduc	

For the past 25 years, the ACRWC and many of its member municipalities have dealt with issues related to excess wet weather flow (WWF). This situation is not uncommon. All wastewater collection systems that have multiple service points and underground pipes have some degree of inflow and infiltration. Generally, inflow and infiltration is considered to be undesirable. Ideally, a wastewater system would strictly convey and treat sewage – precipitation would remain outside of the wastewater system.

What is “wet weather flow”?

Wet weather flow (WWF) is water that enters the sanitary sewer system under wet weather conditions. Water from rainfall or snow melt can enter the sanitary sewer system either directly or indirectly.

Water that enters directly is called **INFLOW**. Some sources of inflow are roof downspouts, foundation drains, cross-connections with storm drains, and manhole covers.

Water that enters indirectly is called **INFILTRATION**. A source of infiltration is groundwater seeping through cracks in sanitary sewer pipes and manholes. Wet weather flow is often called I&I for “inflow and infiltration”.

All communities deal with WWF to some degree, and all sanitary sewer systems are designed to handle a certain level of WWF. But when WWF levels become excessive, sanitary sewer systems can become overloaded, leading to significant environmental, public health, and financial impacts.

Excess WWF is a problem for the ACRWC and the region because it has resulted in:

1. Risks to the environment

WWF has caused increasing volume and frequency of bypasses from ACRWC sewers, pump stations, and the wastewater treatment plant to local watercourses. These bypasses pose risks to the environment.

2. Regulatory contraventions

WWF has caused system bypasses, which have contravened current regulations. The risk of future contraventions is increasing due to moves to adopt tighter CCME and Provincial regulations on sanitary sewer overflows and a potential shift to a loading based regulation by the Province.

3. Health and safety concerns

WWF brings high amounts of inert solids to the wastewater treatment plant. Plant operations staff are required to frequently enter confined and dangerous spaces to clear the

solids. As well, some member municipalities have reported incidents of basement flooding. This poses significant public health concerns.

4. Treatment process performance issues

WWF brings higher than planned flows that result in inefficient treatment performance and undesirable amounts of inert solids.

5. Higher costs

Excess flows result in unplanned capital expenditures to address capacity issues and higher than normal O&M costs from rapid wear and tear of the system. These higher costs must then be recovered from member municipalities.

An Opportunity to Work Together

Over the past few years, the ACRWC and its member municipalities have undertaken several initiatives to investigate and manage WWF. These programs have achieved varying degrees of localized success; however, issues related to excess wet weather flows persist, at the local and regional level. Given these challenges, it has become clear that a coordinated, region-wide Wet Weather Flow Management Strategy is needed to meaningfully address excess WWF.

This Wet Weather Strategy is essentially about helping the region work together to solve WWF issues. A regional problem necessitates a regional approach. This Wet Weather Flow Management Strategy will help the ACRWC and its members:

- Better understand the sources and impacts of excess WWF
- Coordinate efforts to reduce WWF or convey and treat it
- Find the most cost-effective solutions
- Establish roles and responsibilities
- Share resources/knowledge/data
- Allocate costs fairly across member municipalities
- Improve transparency
- Track progress

All of which will help the region find sustainable solutions to excess WWF.

Developing the Wet Weather Strategy

The ACRWC worked in close collaboration with its member municipalities and the City of Edmonton Drainage Services Department to develop this Strategy. The Strategy was developed through three facilitated workshops involving all 13 member municipalities:

Workshop 1 – Strategy Goals and Guiding Principles (Sept 11th, 2013)

Members of ACRWC's Technical Advisory Committee (TAC), along with senior management from the member municipalities and ACRWC staff worked through a series of facilitated questions to develop goals and guiding principles for the Strategy.

Workshop 2 – Strategy Programs (December 4th, 2013)

Members of the TAC and ACRWC staff reviewed the major components of the Strategy (called Programs) to identify the strengths and benefits and note any areas requiring improvement or clarification. The Programs were developed in accordance with the overall Strategy Goals and Guiding Principles.

Workshop 3 – Draft Strategy Review (April 16th, 2014)

Members of TAC, senior management from municipalities, and ACRWC staff reviewed the Draft Strategy and agreed to the document pending minor modifications.

WWF Survey

In addition to the workshops, a survey was also distributed to each member municipality to gather information on excess WWF issues. The survey was followed up by in-person interviews at each municipality to further understand municipal perspectives and experiences.

A number of themes arose through the consultation process, most notably:

- The need for more information regarding the scale and sources of WWF in the region;
- The concern that the current rate structure is inequitable and that a new rate structure would be needed to allocate costs fairly;
- The need to make cost-effective investments; and
- The desire for local autonomy – municipalities wish to maintain their autonomy over local level decisions.

This Strategy reflects these themes, and is based on the discussions that were had in the three workshops, as well as the information gathered through the survey and interviews

Wet Weather Flow Management Strategy Components

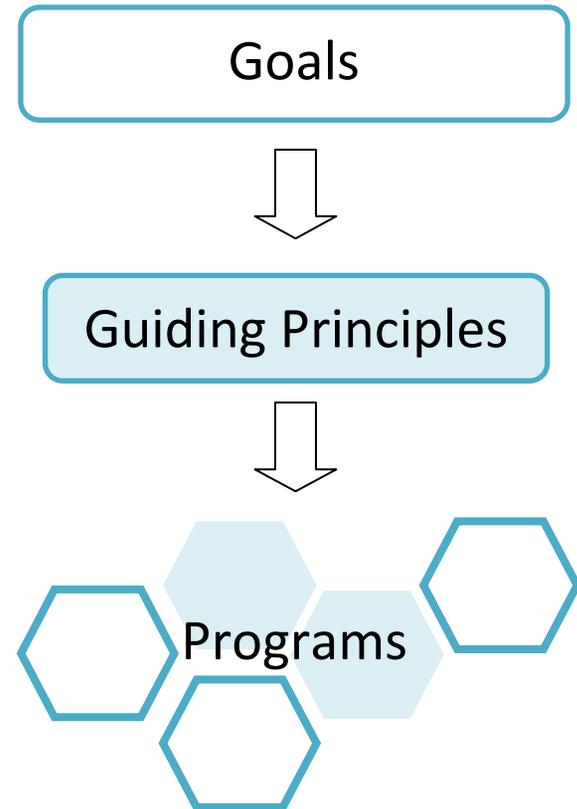
This Strategy is made up of three main components:

GOALS – these identify **WHY** the Strategy exists at all. Achieving the Goals is the purpose of the Strategy.

GUIDING PRINCIPLES – these articulate **HOW** we will work together to achieve the goals - or how we will do what we do.

PROGRAMS - these are the action components of the Strategy. The Programs describe **WHAT** will be done. Program elements will align with the Goals and Guiding Principles. The Programs will be conducted in a way that builds continuous improvement. As the ACRWC and its municipalities learn more about the sources of WWF and of its impacts/risks, that information will be used to improve Program details.

Each of these components is described further in the following pages



Goals

The goal of the Strategy is to reduce the impact of wet weather flows from three perspectives:

- 1. *Environmental;***
- 2. *Protection of the health and safety of public and staff; and***
- 3. *Financial.***

Together, these are the reasons WHY the Strategy exists. All other elements and details of the Strategy (including the related Implementation Plan) have been developed to meet these goals.

Guiding Principles

The Guiding Principles articulate the way in which we will work together to achieve the goals - or **HOW** we will do what we do. The guiding principles of the Strategy are:

1. **Holistic Decision Making.** Decision making processes consider environmental, social, and economic benefits, costs, and risks. Decisions are evaluated from a whole system perspective.
2. **Evidence Based.** Investments in wet weather management initiatives will be informed by appropriate evidence. Investments in information collection will be proportionate to the expected return on investment.
3. **Continuous Improvement.** Uncertainty underlies many of the challenges of managing wet weather flows and much will be learned as flows are monitored and initiatives are evaluated. A Plan-Do-Monitor-Act cycle of continuous improvement will be applied to ensure that investments of time and resources continue to provide value throughout the implementation of the strategy.
4. **Cooperation and Coordination.** The ACRWC will lead members in working together to manage wet weather flows on a regional and local scale; promoting resource and knowledge sharing, enabling the evaluation of initiatives from a regional system perspective, and improving the overall effectiveness of the strategy.
5. **Independence.** The ACRWC and municipal members will be free to choose and implement their own projects and initiatives. There is no one-size-fits-all solution.
6. **User pay.** Each municipality is accountable financially for the flows they contribute to the regional system.
7. **Communication.** Communication and education is proactive and ongoing with the aim of enabling member staff, councils, and the public to reduce wet weather flows.

The Programs and detailed Implementation Plan have been developed to be consistent with these Guiding Principles.

Programs

A “program” is a set of related tasks with a common purpose. This Strategy is made up of five Programs:

1. Data Collection & Analysis
2. Communication & Education
3. Investment Planning & Decision-Making
4. Rate Setting
5. Program Management & Continuous Improvement

The table on page 9 provides the following information for each of the five Programs:

- **Purpose** – a statement of the overall intent behind the Program.
- **Key Benefits** – a list of the key benefits the Program is expected to yield – that is, the rationale for the Program.
- **Key Actions** – a list of key tasks that will be undertaken within the Program. Tasks will be designed to support the Strategy Goals and will be consistent with the Guiding Principles.

Although the Programs are identified separately, in reality they are interdependent. The outputs of one Program directly impact other Programs. For instance, the flow data collected under Program 1 – Data Collection & Analysis will be needed to develop an appropriate rate under Program 4 – Rate Setting. Because of this interdependence, progress will need to be made in all five Program areas in order to find lasting and effective solutions to WWF issues. The Strategy will be most effective if it unfolds in a comprehensive manner.

PROGRAM AREA	PURPOSE	KEY BENEFITS	KEY ACTIONS
Data Collection & Analysis	To quantify wet weather flows, the resulting impacts on the ACRWC system and the environment, and performance on overall strategy goals.	<ul style="list-style-type: none"> • WWF data improves decision making regarding: <ul style="list-style-type: none"> ○ rate setting ○ ACRWC investments ○ Municipal investments • Will track progress over time, enabling continuous improvement 	<ol style="list-style-type: none"> 1. Conduct flow and rainfall monitoring 2. Develop and implement reporting framework (including reporting on incidents/system overflows)
Communication & Education	To keep all stakeholders (e.g., member municipalities, the public, and elected officials) well-informed of Strategy activities and WWF issues.	<ul style="list-style-type: none"> • The more well-informed stakeholders are, the better able they are to take suitable action on WWF issues • Improves acceptance of implementation activities - avoids “surprises” (especially re: rate changes) 	<ol style="list-style-type: none"> 1. Develop communication and education plan <ul style="list-style-type: none"> ○ Progress reports ○ WWF summaries for member municipalities and the ACRWC ○ Workshops
Investment Planning & Decision-Making	To develop a set of tools and processes to support investment planning and decision-making.	<ul style="list-style-type: none"> • More efficient and transparent decision-making • Helps ensure investments to address WWF are backed by strong business cases 	<ol style="list-style-type: none"> 1. Develop tools and processes to support investment planning and decision-making
Rate Setting	To ensure the utility rate allocates wastewater service costs fairly across member municipalities.	<ul style="list-style-type: none"> • Ensures fairness – municipalities will pay in accordance to their impact on the regional system • Helps ensures financial sustainability of regional sanitary sewer services • Enables autonomy, encouraging municipalities to assess the cost-benefit of acting locally 	<ol style="list-style-type: none"> 1. Review current rate structure to determine if costs are allocated fairly 2. Review rate structure (every 3 to 5 years)
Program Management & Continuous Improvement	To ensure all Programs stay on track and demonstrate improvement.	<ul style="list-style-type: none"> • Identifies what’s working, and what needs improvement • Ensures the Strategy is supported by needed resources • Strategy initiatives adapt and change over time 	<ol style="list-style-type: none"> 1. Identify required resources based on implementation plan (include program manager) 2. Conduct annual review 3. Develop regulatory framework

Roles and Responsibilities

In keeping with Guiding Principle No. 4 – Cooperation and Coordination, the ACRWC and member municipalities commit to working together to best manage wet weather flows. Achieving the Strategy goals will be a shared responsibility.

While specific roles and responsibilities will need to be identified when detailed implementation plans are developed, in broad terms the ACRWC will take a lead role on regional matters (with support from the municipalities) and member municipalities will take a lead role on local matters (with support from the ACRWC).

Consistent with Guiding Principle 5 – Independence, the ACRWC will not direct local level decisions; however, the ACRWC will support decision-making at the local level through knowledge/data sharing, identifying best practices, and issuing communications material. Member municipalities will maintain their full discretion to address excess WWF in whatever way makes most sense for their communities (within any requirements that might be established in the regulatory framework).

These overarching roles and responsibilities are outlined in the graphic opposite.

While the City of Edmonton participated in the development of this strategy, wet weather flows to and from the City of Edmonton will be monitored, reported and managed through the Regional Wastewater Exchange Agreement between the ACRWC and the City of Edmonton."

The ACRWC will take the lead on...

- Regional system monitoring and reporting
- Coordinating communication and education
- Managing regional infrastructure
- Coordinating investments at a regional scale
- Identifying costs to manage WWF

Member municipalities will take the lead on...

- Managing municipal infrastructure
- Implementing local projects to fit local needs
- Contributing their fair share of costs incurred by ACRWC to handle the WWF they contribute to the regional system

Moving Forward

Implementation of this Strategy will begin immediately. The ACRWC will advance initiatives under all five Program areas, but the initial focus will be on establishing flow monitoring and reporting to better understand the sources and magnitude of WWF and its impacts in the region, which will inform the rate review.

Implementation initiatives are outlined on the following page – the first graphic shows Roles and Responsibilities, and the second graphic provides a timeline. They represent the most significant work that must be done in the near term – they outline the Strategy’s “critical path”. The ACRWC will engage its members on these initiatives throughout Strategy implementation.

Consistent with the ACRWC’s commitment to continuous improvement, the ACRWC and its members will conduct annual reviews of the Strategy to ensure goals are being met. The ACRWC looks forward to working closely with its member municipalities to tackle the issue of wet weather flow.

PROGRAM AREA	INITIATIVE	ROLES AND RESPONSIBILITIES
Data Collection & Analysis	Conduct flow and rainfall monitoring	<p>ACRWC – Lead planning for and implementation of regional flow and rainfall monitoring</p> <p>Members – Provide local input; review implementation plan and provide comments. Lead local flow monitoring</p>
	Develop and implement reporting framework (including reporting on incidents/system overflows)	<p>ACRWC – Co-develop framework with Members; organize and drive process</p> <p>Members – Co-develop framework with ACRWC; provide data to ACRWC</p>
Communication & Education	Develop communication and education plan	<p>ACRWC – Lead development of communication and education plan</p> <p>Members – Provide local input; review the plan and provide comments</p>
Investment Planning & Decision-Making	Develop tools and processes to support investment planning and decision-making	<p>ACRWC – Co-develop tools and processes with Members; organize and drive process</p> <p>Members – Co-develop tools and processes with ACRWC</p>
	Review current rate structure to determine if costs are allocated fairly	<p>ACRWC – Lead rate structure review</p> <p>Members – Provide local input; review rate structure review and provide comments</p>
Rate Setting	Review rate structure (ongoing – every 3 to 5 years)	<p>ACRWC – Lead rate structure review</p> <p>Members – Provide local input; review rate structure review and provide comments</p>
Program Management & Continuous Improvement	Identify required resources based on implementation plan (include program manager)	<p>ACRWC & Members – Identify resources and develop plans</p>
	Conduct annual review	<p>ACRWC – Lead annual review</p> <p>Members – Provide local input; review annual review and provide comments</p>
	Develop regulatory framework	<p>ACRWC – Co-develop regulatory framework with Members; organize and drive process</p> <p>Members – Co-develop regulatory framework with ACRWC</p> <p>Board – Review and adopt regulations</p>

IMPLEMENTATION TIMELINE

