THE CITY OF DAWSON
Box 308 Dawson City, YT Y0B 1G0
PH: 867-993-7400 FAX: 867-993-7434
www.cityofdawson.ca

NOTICE OF SPECIAL COMMITTEE OF THE WHOLE MEETING #CW21-31

This is to inform you a special meeting of City Council will be held as follows:

DATE OF MEETING: MONDAY, DECEMBER 13, 2021

PLACE OF MEETING: COUNCIL CHAMBERS, CITY OFFICE

TIME OF MEETING: 7:00 PM

PURPOSE OF MEETING:

1) Greenwood Engineering Solutions RE: Water Metering Update

DATE MEETING REQUESTED: December 10, 2021
MEETING REQUESTED BY: WILLIAM KENDRICK, MAYOR

Original signed by:
Paul Robitaille, A/CAO

December 13, 2021
Date

City of Dawson

Water Metering Program Design

Adam Greenwood, P.Eng.
Jacob Scissons, P.Eng.

December 13, 2021

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Presentation Overview

1. History of Water Metering in Dawson
2. Overview of Water System
3. Historical Water Use
4. Objectives of Water Metering Program
5. Water Metering Program Considerations
6. Metering Technologies and Reading Approaches
7. Overview of Water Meter Rates Review
8. Next Steps

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History of Water Metering in Dawson

- Water meters were installed in 2002.
- We understand the meters were not put into service based on public concerns about how meters would be read and how customers would be billed.
- Some of the meters that were installed remain in place, while others have been removed.
- All meters were installed, or planned to be installed, downstream of the bleeders.

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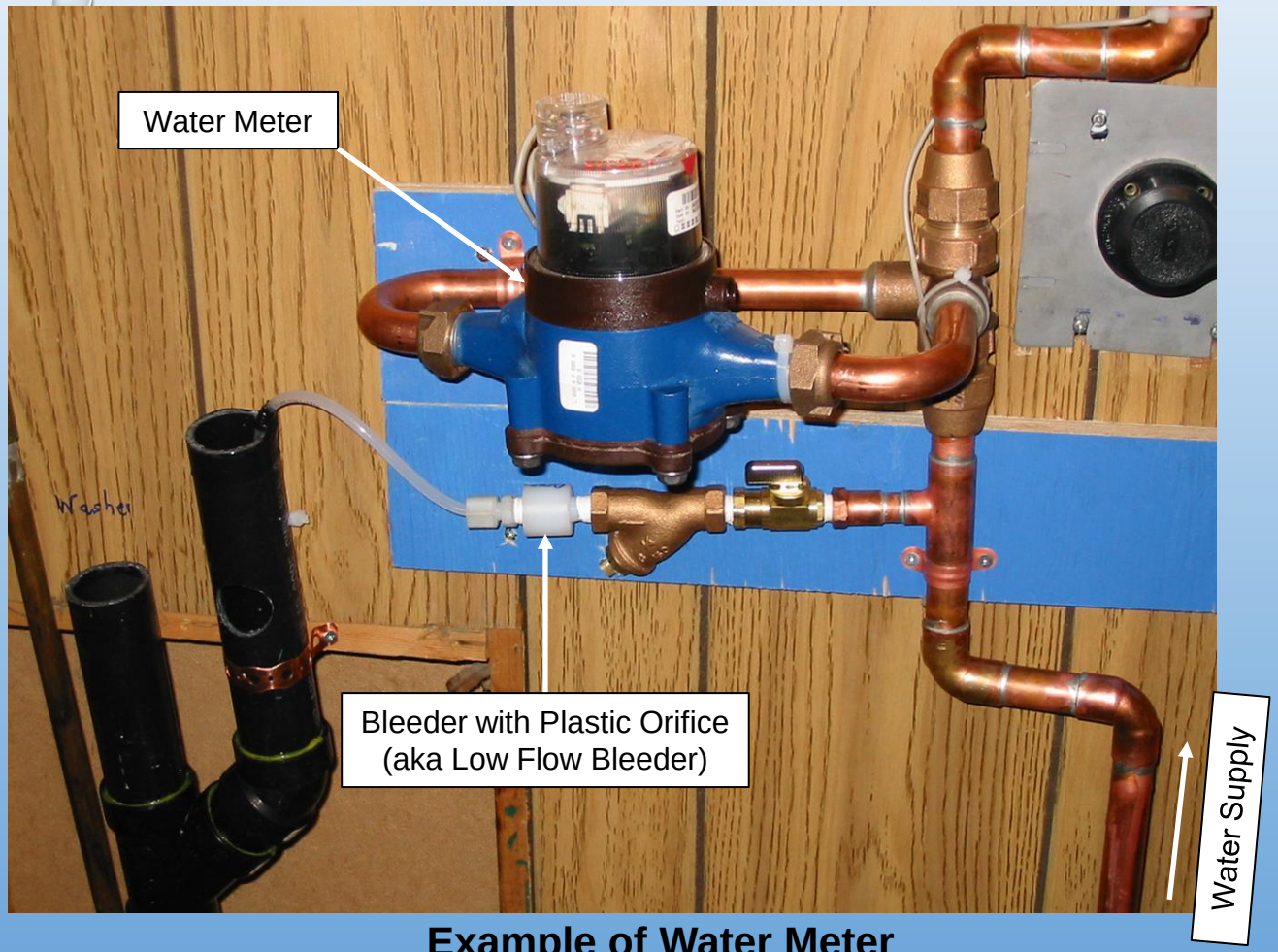
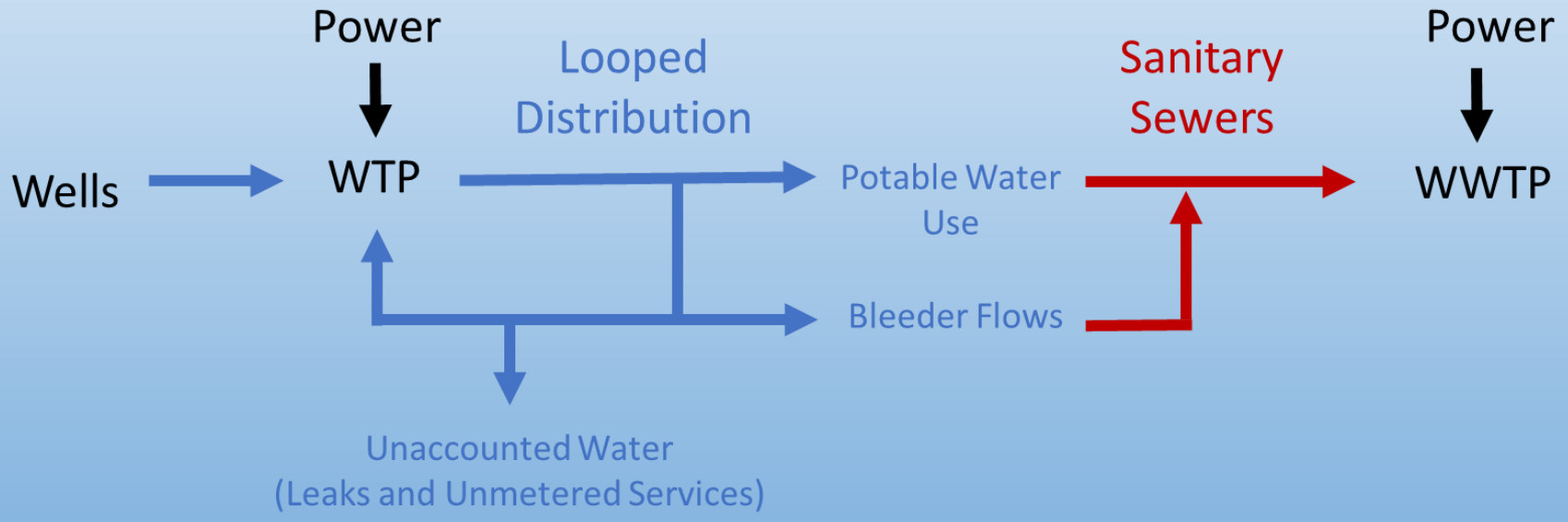
History of Water Meters in Dawson



Example of Water Meter
(Photo from February 2002)

Overview of Water System



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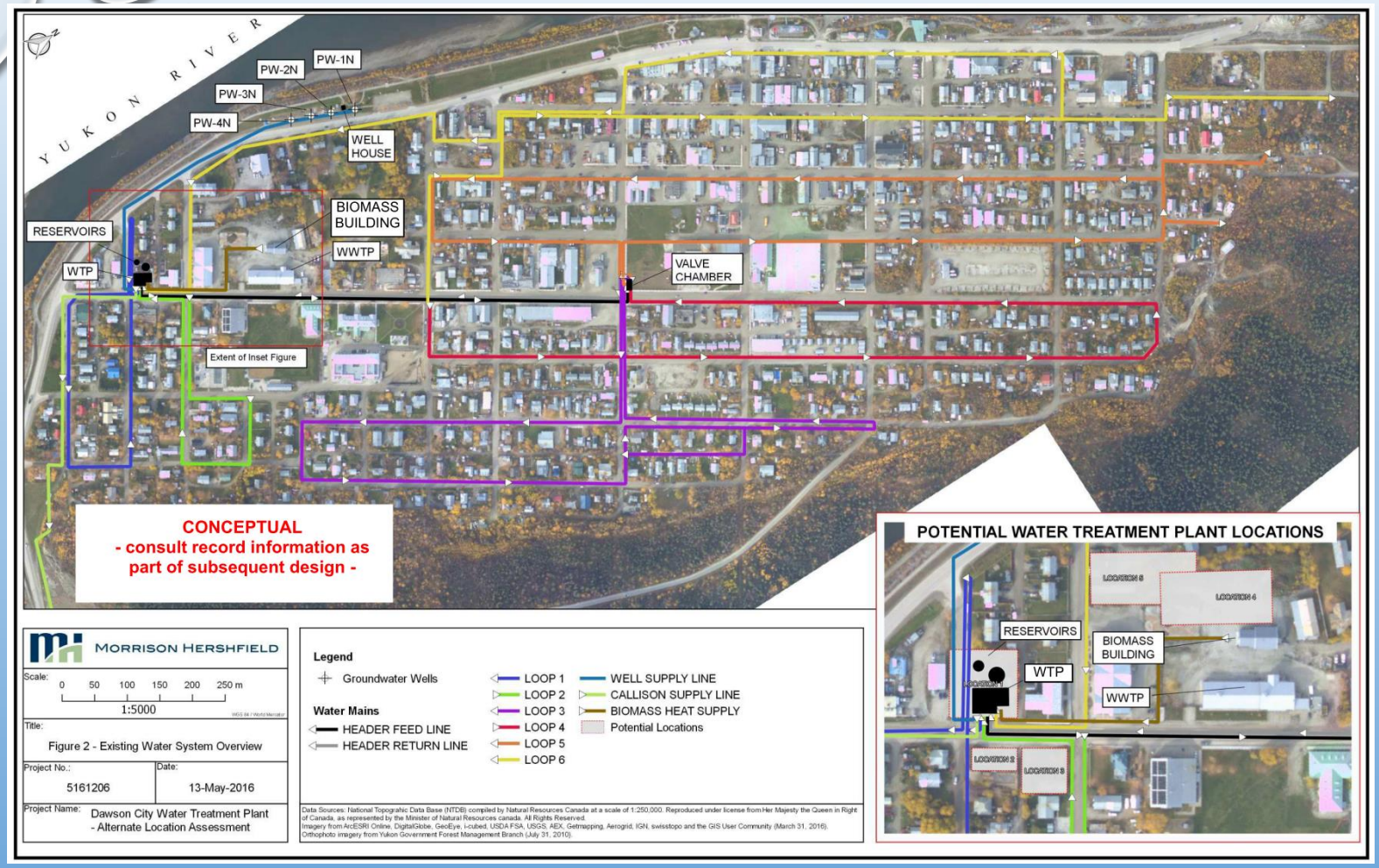
Overview of Water System



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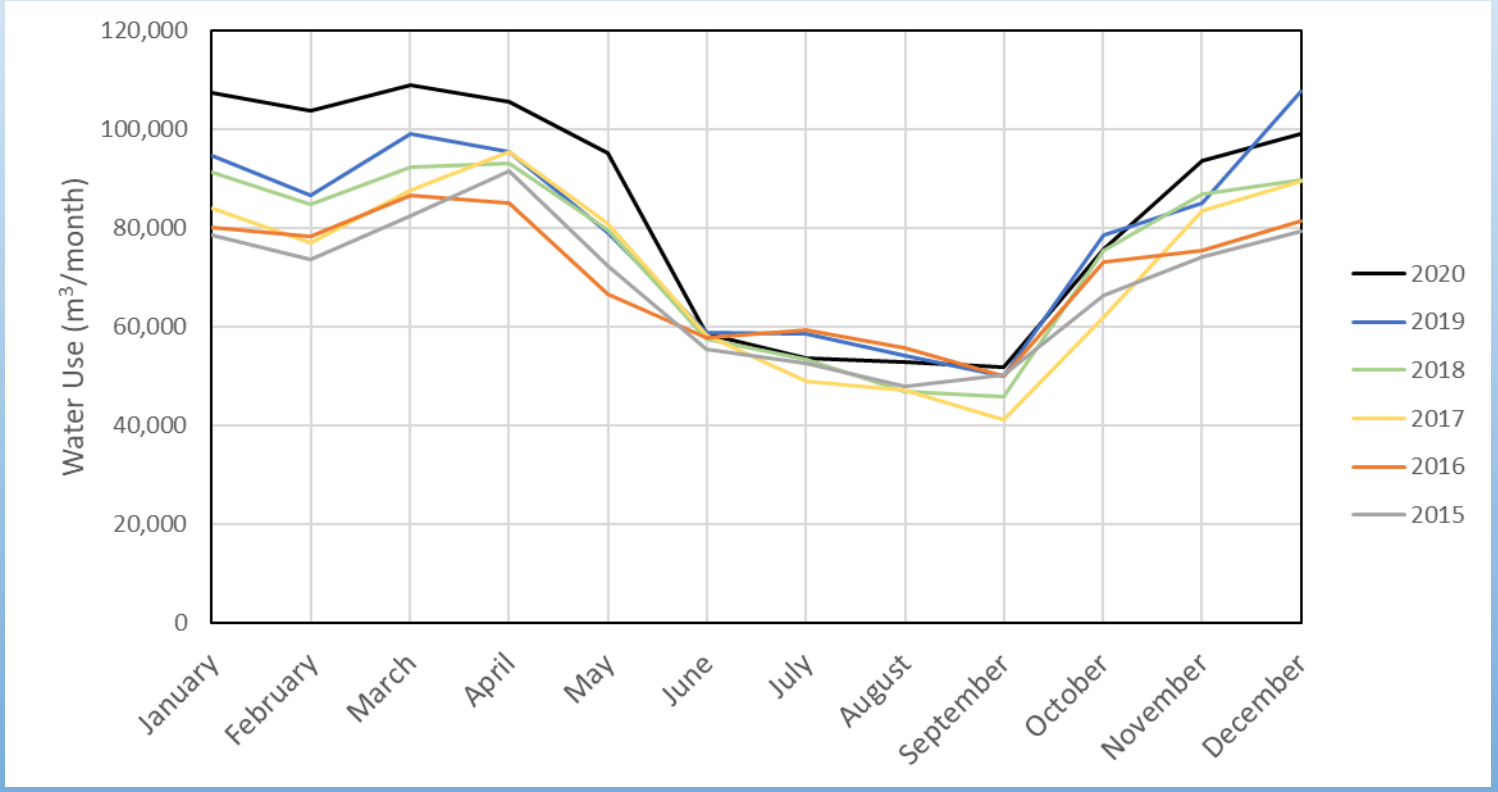
Historical Water Use in Dawson

Winter Water Use = 1.6 times Summer Water Use



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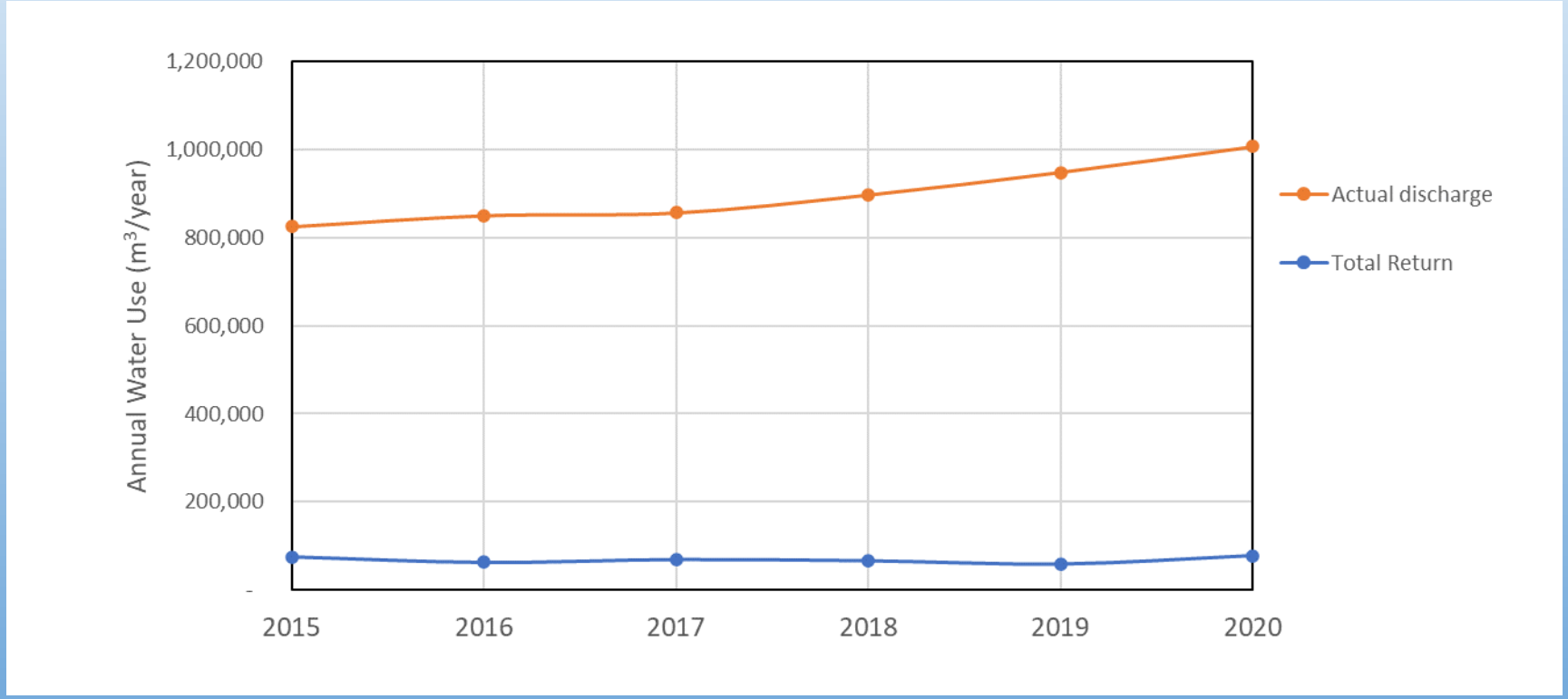
Historical Water Use in Dawson

Annual Water Use is **Increasing** by ~4% per year



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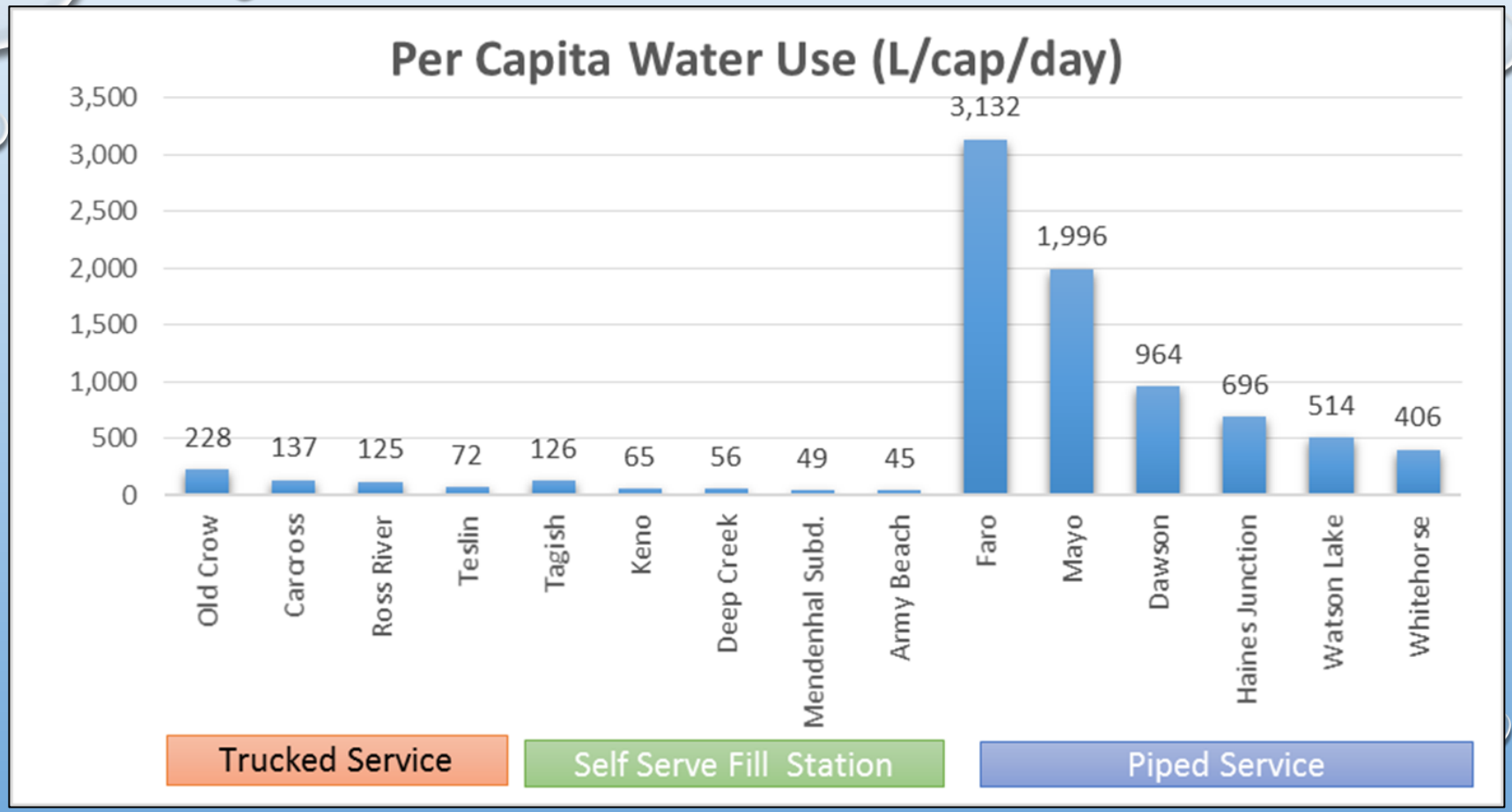
2016 Water Use in the Territory



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Bleeder Flows in Dawson

- Bleeder flows are currently not measured. Based on available data, it is estimated that bleeder flows (and leaks) could represent approximately 60% of the annual system-wide water use.
- There are two types of bleeders:
  - Municipal Bleeders: located at watermain dead-ends and at the start of start of sewer mains.
  - Residential Bleeders: located at all services.

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Objectives of Water Meter Program

1. Reduce residential per capita water use.
2. Charge customers based on actual consumption.
3. Reduce power and operating costs.
4. Understand unaccounted water use (ie. leaks).
5. Understand bleeder water use.
6. Collect water use data for future infrastructure (water and wastewater).
7. Simplify water rates.

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Metering Technologies

- Some metering technologies have been around for 100+ years (ie. positive displacement), but recently vendors appear to be moving towards new technologies (ie. ultrasonic).
- Further to familiar brass body meters, some vendors are moving to plastic (polymer composite) materials.
- Meters are now available with enhanced features such as leak, reserve flow, and tamper detection, pressure and temperature monitoring, and similar.
- Consideration of technical and customer support from meter vendors.

Reading Approaches

1. Touch Read
2. Automated Meter Reading (AMR)
    - Walk-by or Drive-by Radio Read
3. Advanced Metering Infrastructure (AMI)
    - Fixed Network Radio / Cellular Read

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Estimated Costs

Estimated Costs [1]	Touch Read	Drive-by / AMR	Fixed Network / AMI [2]
Capital Cost	$430,000	$595,000	$665,000
Annual Costs	$3,500	$7,000	$25,000

1. Based on supply and installation of 618 meters.
2. Costs for radio and cellular AMI solutions vary by technology / vendor.

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Water Rates Review

- Based on AWWA Best Practices
- Rate Setting Principles and Trade Offs
- Review of Rate Structure Options
- Recommended Approach

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Common Rate Setting Principles

Principle	Description
Fairness and Equity	- Fair to all types of users. - Defendable approach.
Conservation	- Pricing (rate) to encourage water conservation.
Continuity	- With previous approach / philosophy.
Affordability	- Charges are reasonable and not punitive.
Simplicity	- Easy for customers to understand. - Efficient to administer.

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Trade Offs

Revenue Stability	⟷	Conservation
Conservation	⟷	Simplicity
Simplicity	⟷	Equity
Equity	⟷	Affordability

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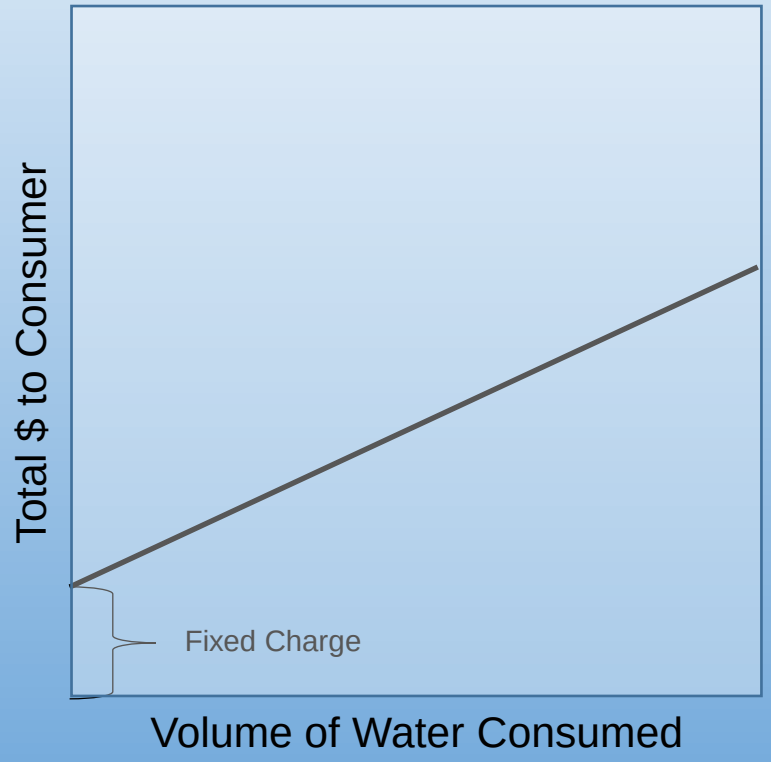
Fixed Charge Model (most common)



- Fixed price for each unit of water.
- Consumer pays starting from first unit.
- Price to consumer increases uniformly with volume used.
- Easy to understand.
- Promotes conservation.
- Good revenue stability.

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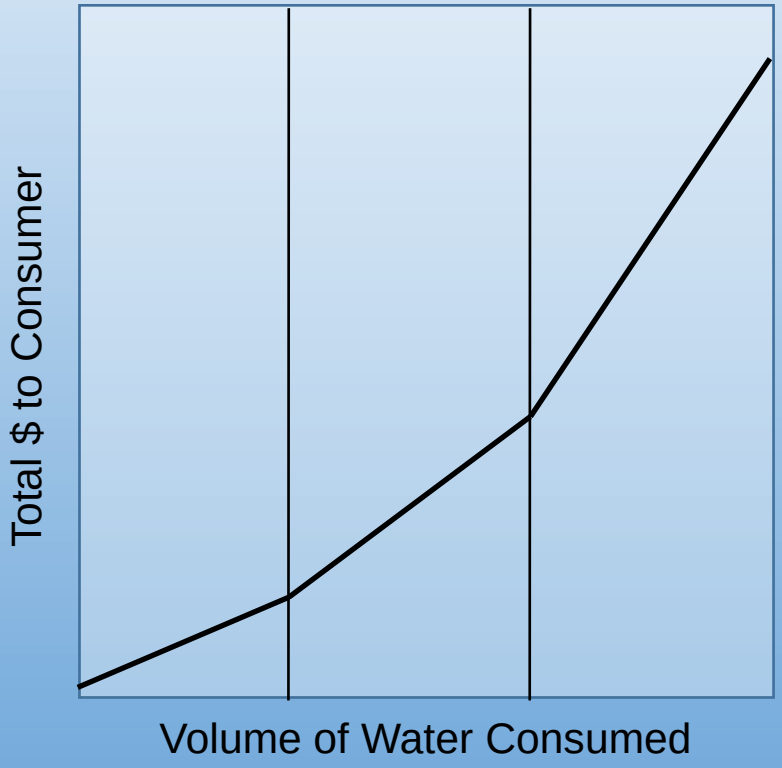
Inclining Block Model



- Successively higher price through a set of usage “blocks”.
- Supports conservation.
- Highest revenue volatility.
- May lead to inequities if applied “across the board” to all customer classes.
- Not as easy for consumer to understand.

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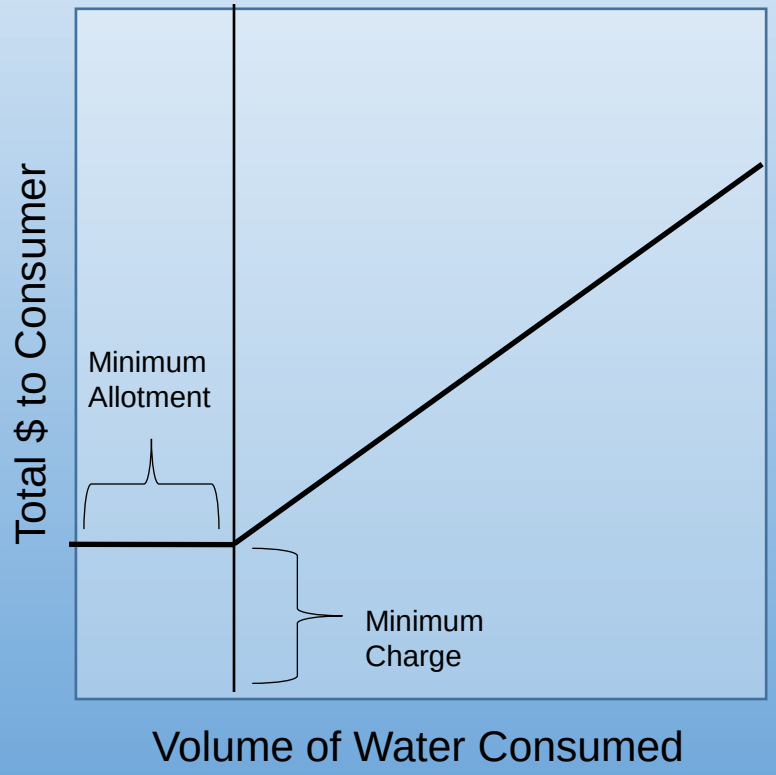
Minimum Charge Model



- Similar to a fixed charge, but includes an allotment of water.
- Variable rate “kicks in” after allotment is exceeded.

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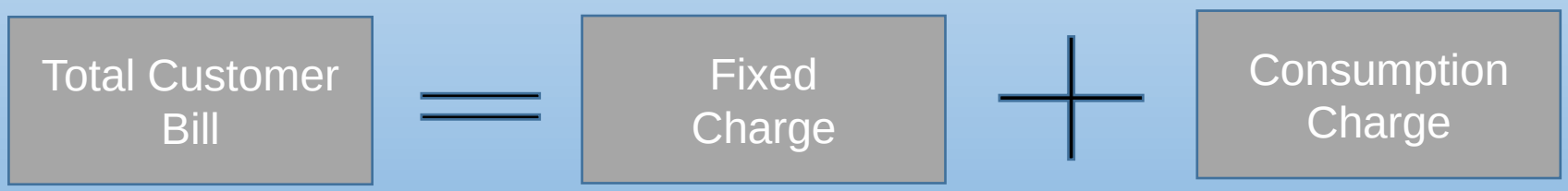
Rate Structure Components

There are typically two components to a metered rate structure:



Does not vary with amount of water used.

Varies with amount of water used.

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Fixed Charge

- For rates to be fair, the fixed charge should be proportionate to the amount of water used.
- AWWA recommends basing the fixed charge on “equivalent connections”.
  - For example a 4” connection can pass the equivalent water as twelve (12) - 1” connections.

Connection Size (inches)	Equivalent Connections
1	1
1.5	2
2	3
3	7
4	12
6	25
8	32
10	46
12	60

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Example of Potential Costs

Fixed Charge Examples

% Revenue from Fixed Charge	Monthly Fee	Volumetric Rate ($/m^3)	Low Water User (23 m^3/month)	Moderate Water User (35 m^3/month)	High Water User (46 m^3/month)
25%	$24	$1.76	$65	$86	$105
50%	$48	$1.17	$75	$89	$102
75%	$73	$0.59	$86	$93	$100

1. Low Water User consumes 300 litres of water per person per day.
2. Moderate Water User consumes 450 litres of water per person per day.
3. High Water User consumes 600 litres of water per person per day.
4. Fees are based on 2.5 people/household.
5. Assumes 618 services.
6. Assumes total annual water sales of 350,000 m^3/year.
7. Assumes $820,000 water revenues are required to run the water system.

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Example of Potential Costs

Example of Leaky Toilet Cost

Leaking Toilet	Water Use (L/day)	Cost per Year		
		25% Fixed Charge	50% Fixed Charge	75% Fixed Charge
Small Leak	100	$64	$43	$21
Medium Leak	1,000	$641	$428	$214
Large Leak	15,000	$9,620	$6,414	$3,207

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Trade Offs

What matters in Dawson?

Implementation

1. Confirm metering drivers and program goals / objectives.
2. Conduct analysis of meter location, bleeder integration, etc.
3. Conduct meter / reading technology review and develop specifications.
4. Evaluate procurement options and prepare cost estimates.
5. Develop implementation program.
6. Finalize Request for Proposal (RFP) — We are here
7. Initiate public engagement / consultation.
8. Select meter manufacturer / installer via RFP
9. Install new meters / reading system.
10. Revisit metering program after one year of operation.
11. Update Water Rates Bylaw.

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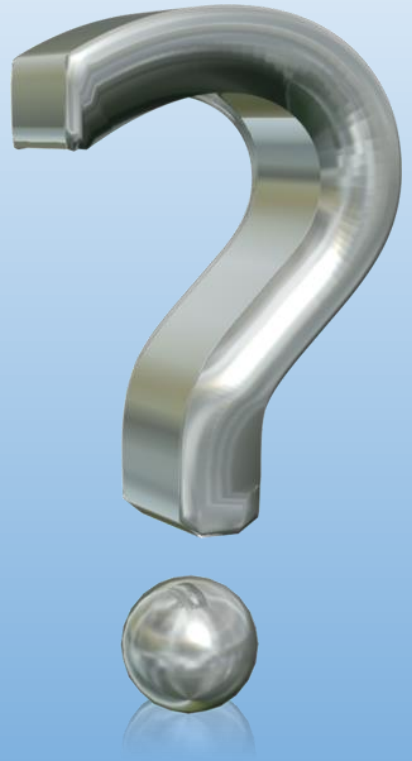
Questions



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