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Review of Functional Servicing Study

Havelock South Development Area

August 13, 2020

Background

- November 2018 - Engage Engineering Ltd. prepared a report entitled “Functional Servicing Study – Havelock South Development Area” for the Township of Havelock-Belmont-Methuen
  - The purpose of the report was to identify the servicing requirements (water, wastewater, and stormwater) for a proposed development in the south part of the Village of Havelock
- August 2020 - OCWA was requested to summarize the findings of the Engage Engineering report for Council
  - This presentation presents the findings of the Engage Engineering report. OCWA has not conducted any technical review or verification of data.

Report Inputs and Assumptions

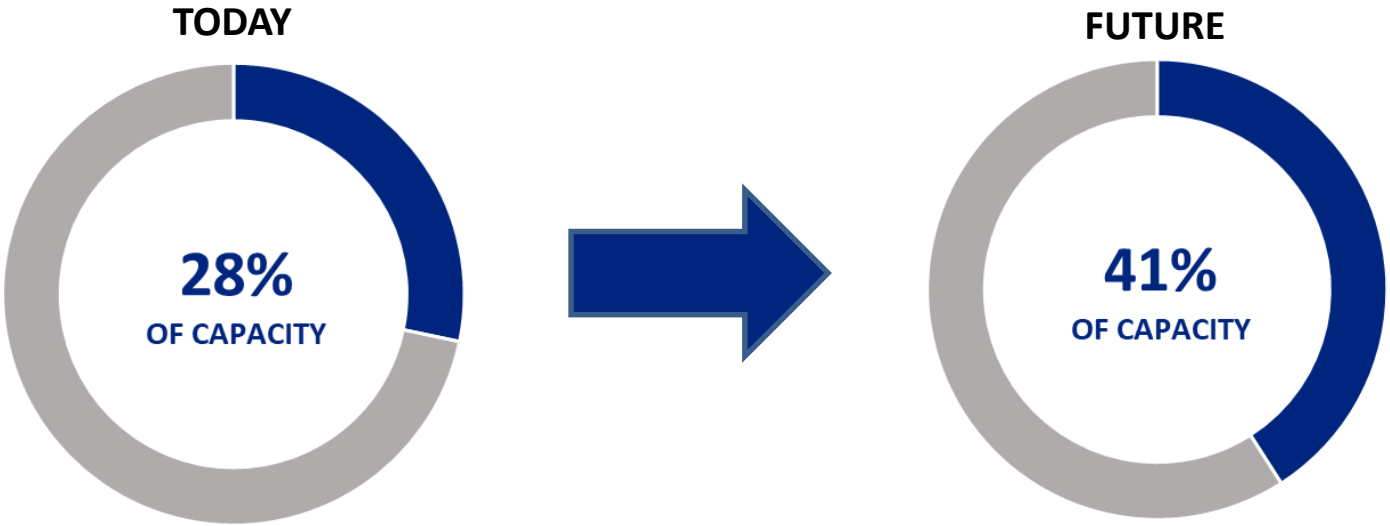
- New Development
  - Phase 1
    - 7 homes
    - Smith Drive
    - Peterborough Housing Development
  - Phase 2
    - 23 homes
    - Extension of Smith Drive
    - Havelock Long-Term Care Facility
  - Phase 3
    - 101 homes and associated roadways
- Drinking water will be provided by three wells with associated treatment systems
- Wastewater will be conveyed to existing Havelock Sewage Treatment Plant

Overview of Report – Key questions addressed

- Water Servicing
  - Do the wells have enough capacity for new development?
- Sanitary (wastewater) Servicing
  - Does the sewage treatment plant have enough capacity?
- Stormwater Management requirements
  - How do we control stormwater during heavy rainfall?

Water Servicing

- Current Drinking Water System Capacity
  - 2,333 m^3/day
- The proposed development is within the current capacity – no modifications required



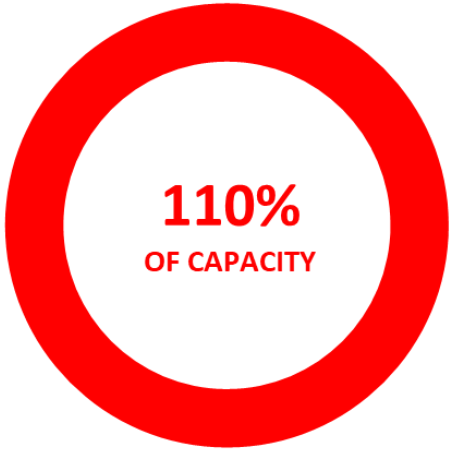
Existing Average Daily Flow – 660 m^3/day

Existing + Proposed Development Average Daily Flow – 955 m^3/day

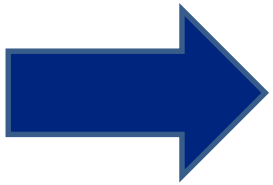
Sanitary Servicing (Wastewater)

- Current Capacity of Sewage Treatment Plant
  - 1,200 m^3/day
- Plant is over capacity with existing conditions
- Plant requires upgrade before building new development

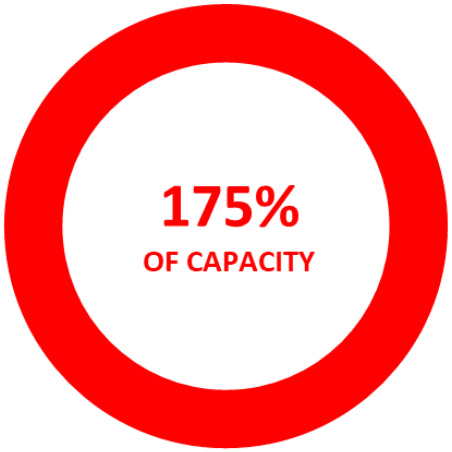
TODAY



Existing Average Daily Flow – 1,314 m^3/day



FUTURE



Existing + Proposed Development Average Daily Flow – 2,098 m^3/day

Sewer Capacity

- Due to higher flows, some sections of sewer will need to be replaced with larger diameter pipes
  - Pipe on County Road 30 between MH 113-MH 116 (260 m) will need to be replaced with 300 mm diameter pipe to accommodate additional flows

Sewer Location	Manhole ID	Capacity Existing Conditions	Capacity Proposed Development
County Road 30	MH 111 to MH 95	2-20%	2-49%
Ottawa Street	MH 96 to MH 1	10-69%	10-85%
County Road 30	MH 113 to MH 116	74-98%	90-120%
Old Norwood Road	MH NOR to MH 116	5%	11%
County Road 30	MH 116 to MH 122anhold or	54-65%	67-81%
County Road 30	MH 122 to MH 132	70%	88%

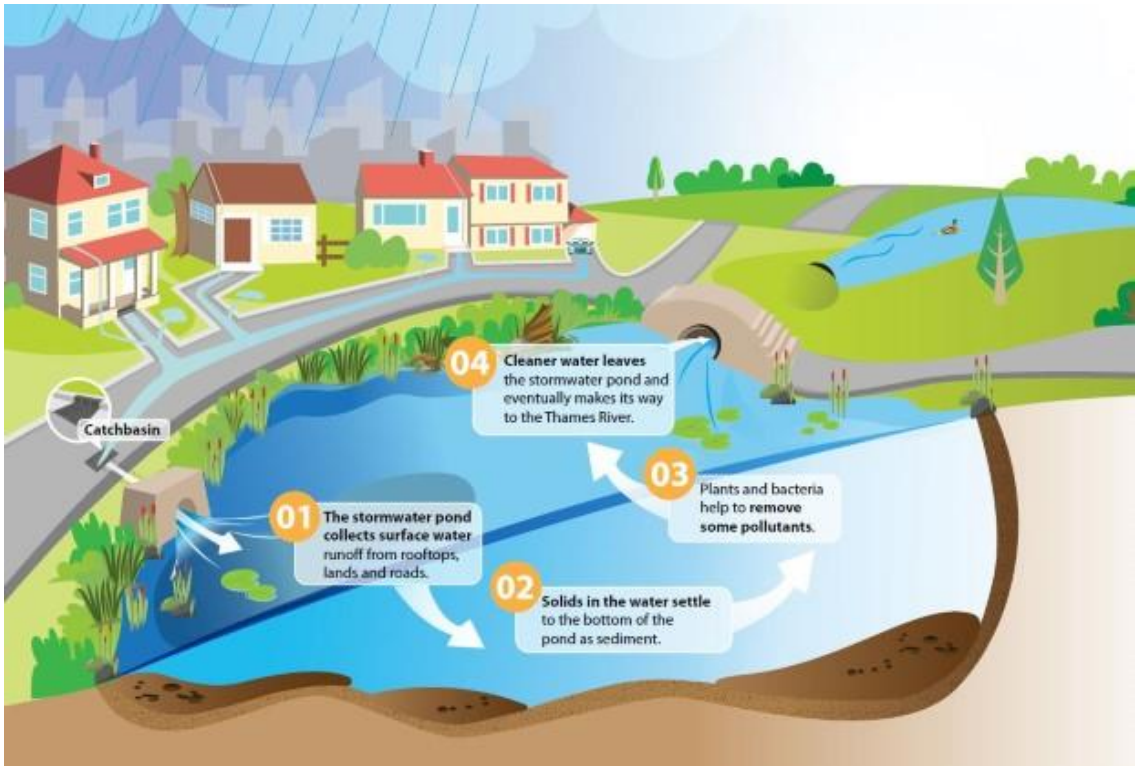
Stormwater Management

- Impervious (paved) surfaces prevent rain from naturally soaking into the ground
- Instead, water runs into storm drains and drainage ditches and often carries debris, chemicals and other pollutants to streams, rivers, lakes, or wetlands
- Can also cause flooding, erosion, turbidity (muddiness), storm and sanitary sewer system overflow

Proposed Stormwater Management Controls

- The proposed development will increased impervious (paved) area, so stormwater management controls are required
- The report proposes a **stormwater management (SWM) pond** that will cover an approximate area of 10,000 m^2

- A SWM pond:
  - Collects rainfall and surface water runoff.
  - Provides erosion and flooding control
  - Improves quality of the water
  - Allows sediment and contaminants to settle out
  - Holds back water in order to release it at a controlled rate during large storms.



Source: london.ca

Report in Summary

- Water – no work is required
- Wastewater - Plant requires upgrade before building new development
- Wastewater sewers - some sections of sewer will need to be replaced with larger diameter pipes
- Stormwater – stormwater management pond to be constructed

What's Next?

1. Immediate
- Inflow and Infiltration Study – **Complete (Sewer Technologies)**

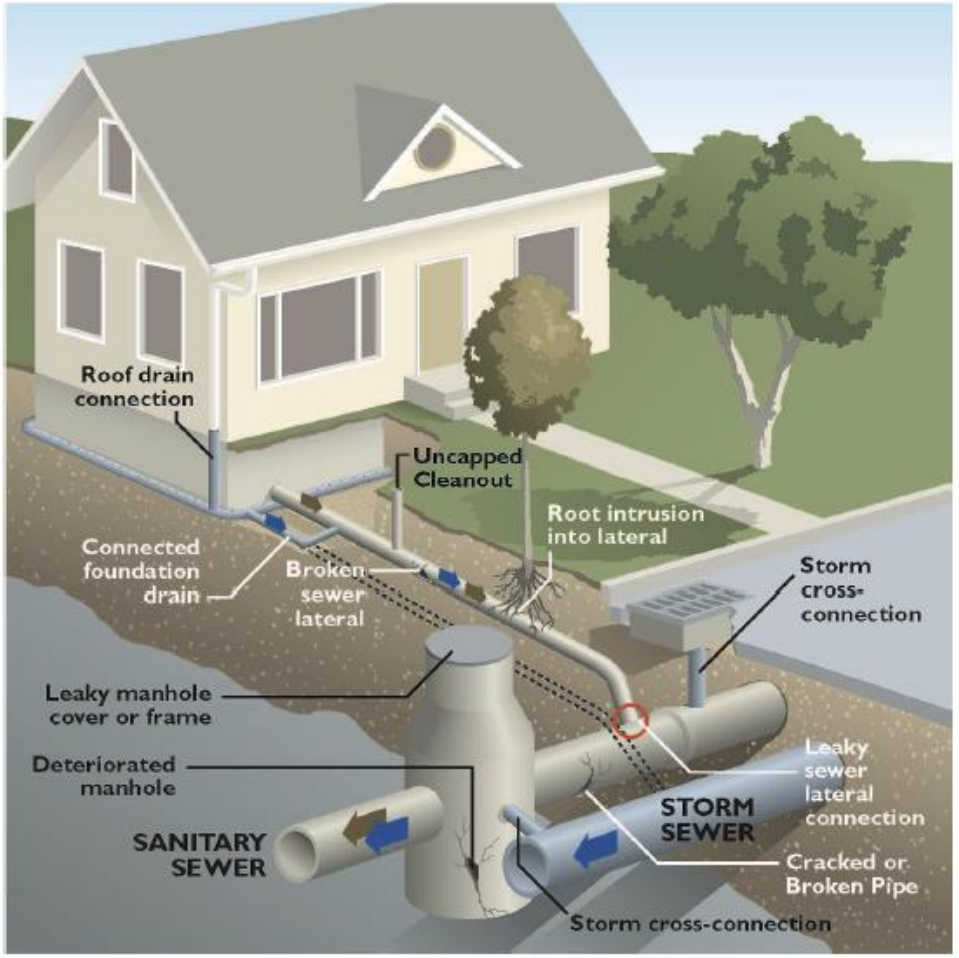
2. Short Term
- Plan expansion of existing STP – **In Process**
- Class Environmental Assessment – **In Process**
- Implement I&I solutions – **Complete (Sewer Technologies)**

3. Long Term
- STP and sewer upgrade
- Stormwater management pond

Inflow and Infiltration Study

Inflow and Infiltration (I&I)

- Accounts for approx. 50% of average daily wastewater flow
- Study recommended to find source and assess feasibility of creating additional capacity
- Insight from OCWA Operations
  - During dry weather (currently), STP is running at half capacity
  - Wet weather flows (past years) can be up to 2000 m^3/day



(Source: www.crd.bc.ca)

Inflow

- Generally consists of storm water
- Sources include: sump pumps, roof leaders, foundation drains, surface drains, manhole covers, cross-connections from storm infrastructure

Infiltration

- Generally consists of groundwater
- Fluctuates with season (larger volumes in spring)
- Sources include: defective pipes, pipe joints, connections and manhole walls

I&I Study

- Cost and timeline depends on extent of study
- Can consist of
  - MH inspections
  - SL-RAT (detects blockages)
  - Smoke testing
  - CCTV
- Deliverables
  - Reports with flow analysis
  - Inspection results
  - Next step recommendations
  - “Shovel-ready” projects

Approximate Cost of I&I Study

- Example from 9 km system in Northern Ontario in 2018

Activity	Approximate Cost
MH Inspections	$20,000
Smoke Testing	$12,000
CCTV Data Collection	$85,000
Project Management and Engineering	$65,000
TOTAL	**$182,000**

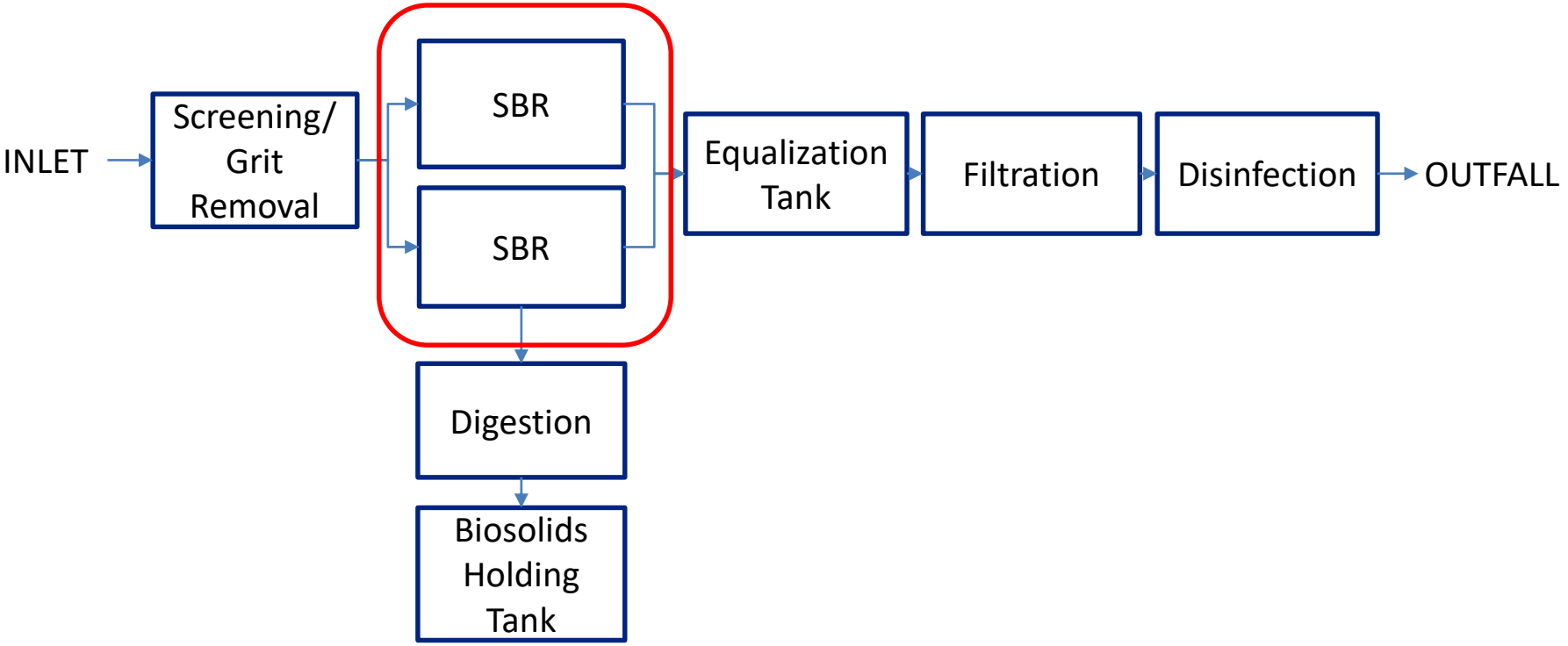
Timeline for I&I Study

- Smoke Testing – 5 km / day
- MH Inspections – 40 / day
- SL-RAT – add 2 minutes per MH
- CCTV – depends on condition of pipe (more cleanup and flushing, more time) – 300 m per day

Sewage Treatment Plant Upgrade

Sewage Treatment Plant Upgrade

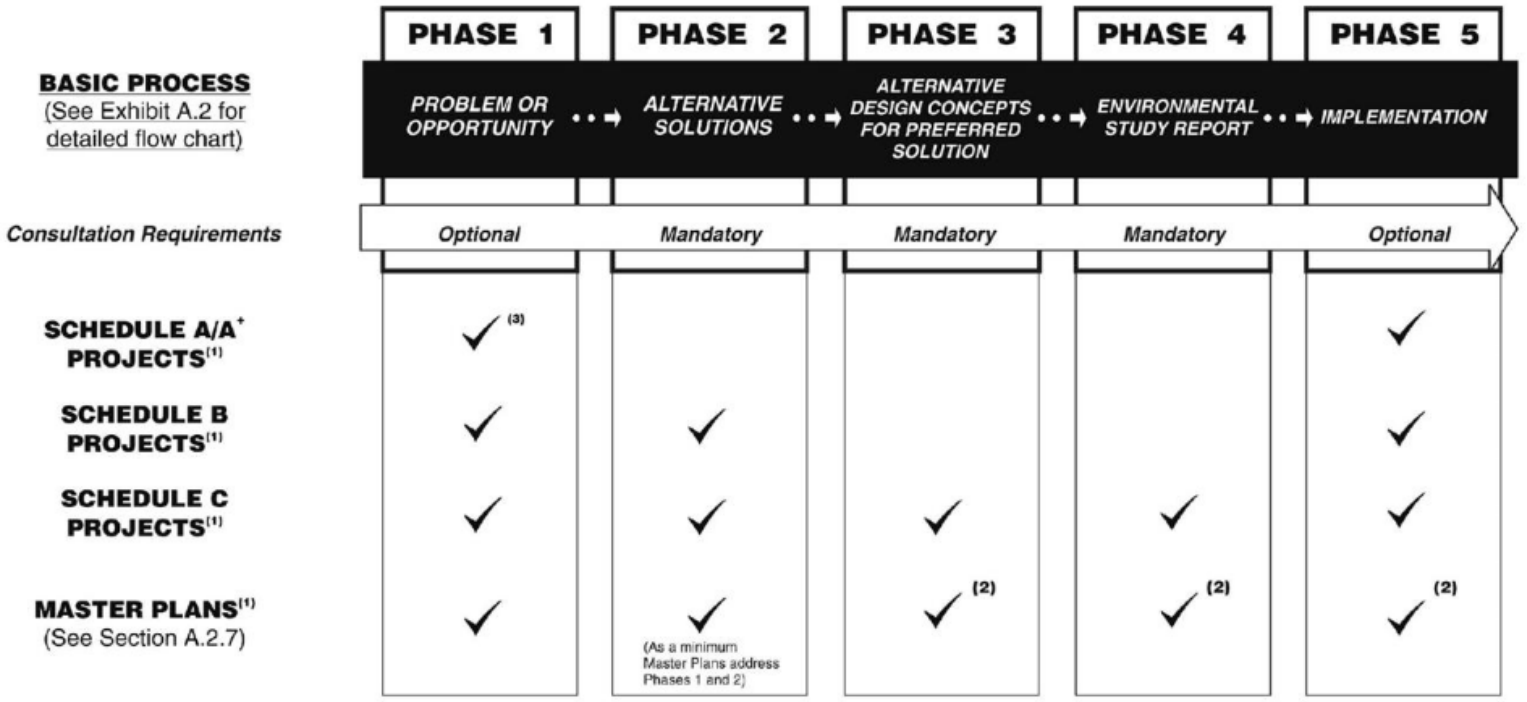
- Capacity limited by SBR – combined capacity of 1,200 m^3/day



Class EA – Schedule C

- A planning and decision making-tool
- Objectives
  - Minimize or avoid adverse environmental effects before they occur
  - Incorporate environmental factors into decision making
- Schedule C - Expand the existing sewage treatment plant beyond existing rated capacity

EXHIBIT A. 1 KEY FEATURES OF THE MCEA



NOTES:

✓ Actions required during relevant phase

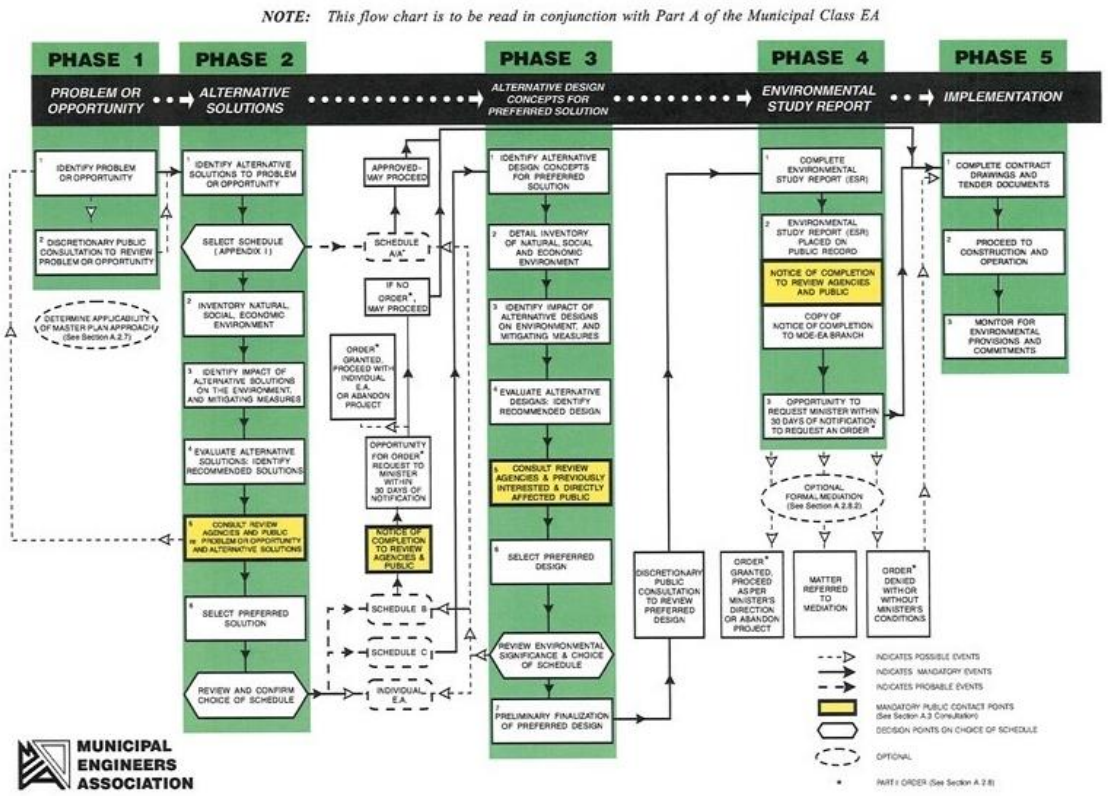
(1) Schedule A, A+, B and C projects and Master Plans can also be integrated with the requirements of the Planning Act (See Section A.2.9)

(2) Complete Phases 3 and 4 for any Schedule C projects included in the Master Plan prior to implementation

(3) For Schedule A+ projects, public to be advised. See Section A.1.2.2.

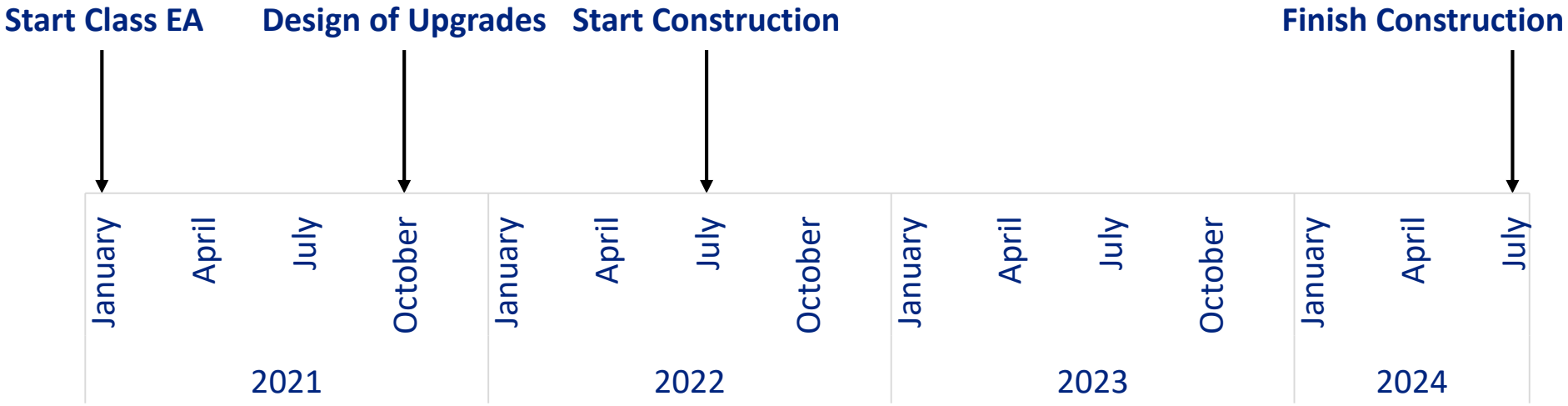
Class EA Process

- Class EA Schedule C entails:
  - Identify problem
  - Identify alternative solutions
  - Identify alternative design concepts for preferred solution
  - Complete Environmental Study Report
- Requires consultation with public and other stakeholders (First Nations, regulators, etc.)
- Requires review of alternative solutions and their impact on the environment (Archeological investigation, species at risk, etc.)



Approximate Upgrade Timeline

- Class EA – 8-10 months
- Design – 8-10 months*
- Construction – 2 years*



*Time may vary depending on complexity of upgrade

Cost of Plant Upgrade

- For planning purposes only

Activity	Indicative Cost Range[1]
Class EA – Schedule C	$75,000-$225,000
Engineering and Design	$375,000-$1,125,000
Construction and Equipment Purchase	$2,000,000-$5,250,000
TOTAL	**$2,450,000-$6,600,000**

1. Class 5 cost estimate with +/- 50% accuracy as per the AACE Cost Estimate Classification System – As Applied In Engineering, Procurement, And Construction For The Process Industries (March 1, 2016).

Key Decisions for Council

- Start I&I Study
  - Reduce the flow of sewage
  - Review what work has been done
- Planning STP Upgrade and Sewer Upgrade
  - Investigate available funding
  - Develop project plan and timeline
  - Getting ready for “shovel-ready” status

Questions?

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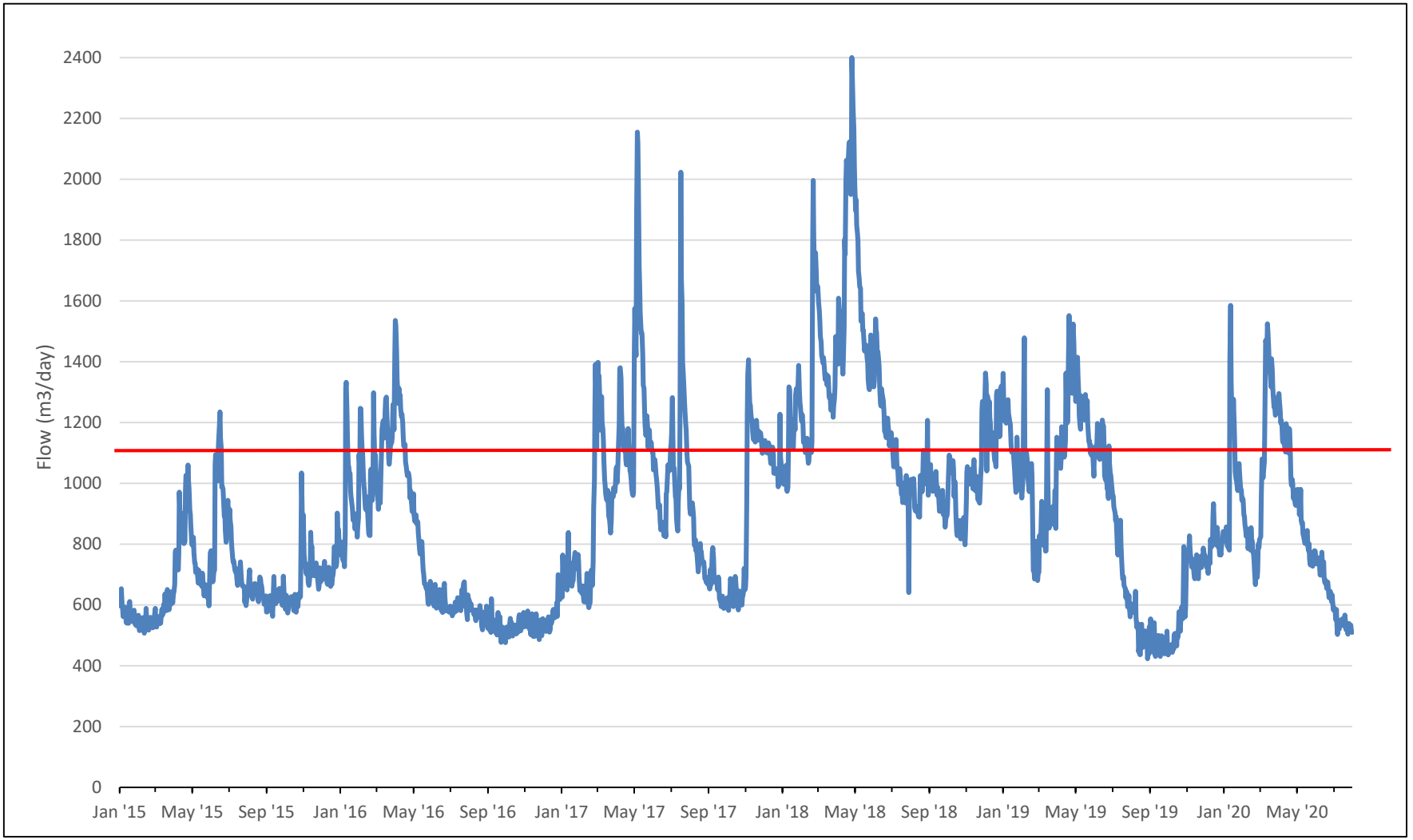
Analysis of W&WW Flows
Havelock South Development Area

August 24, 2020

WW Flow – Last 5 Years

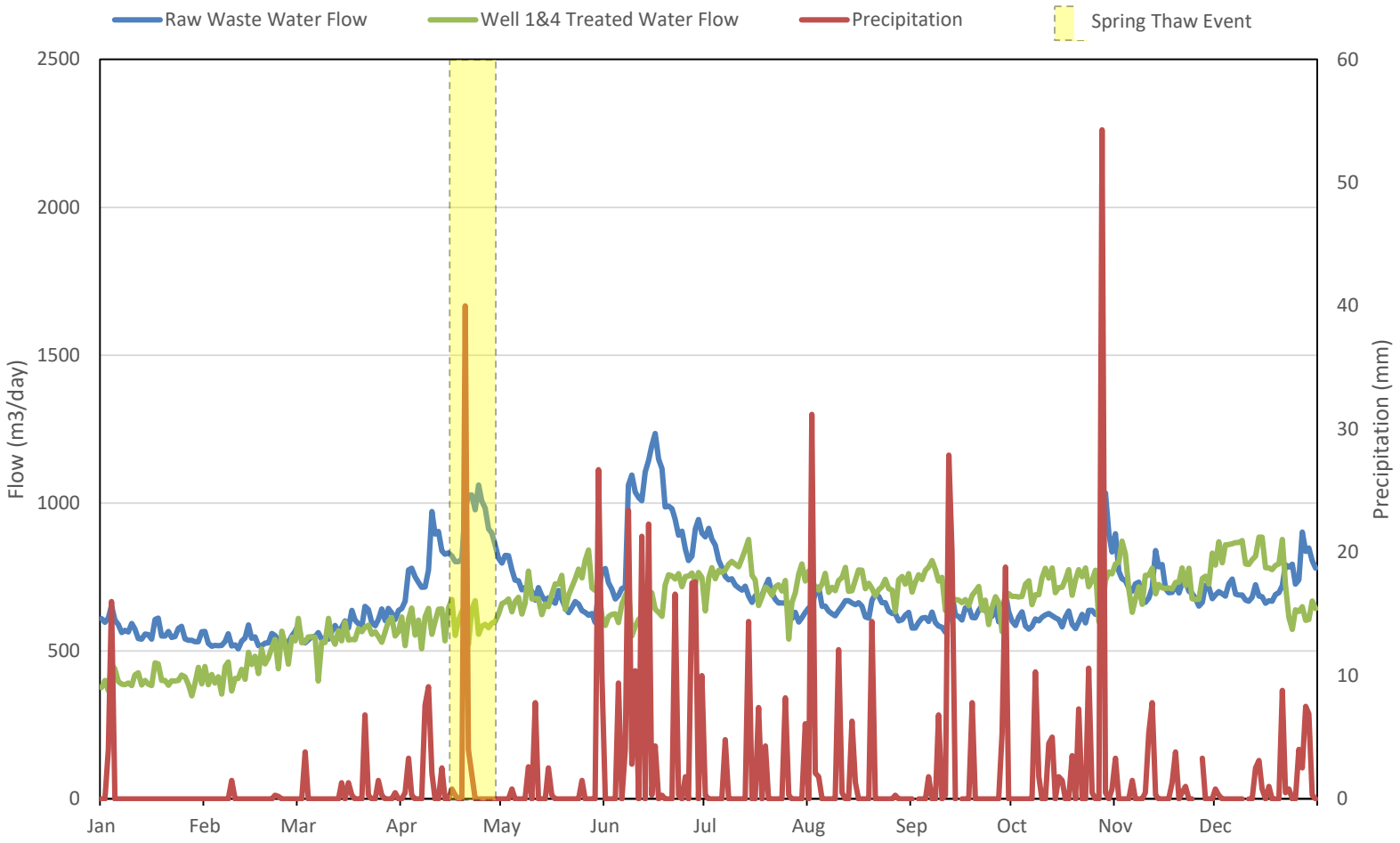


Summary of WW Flow Data

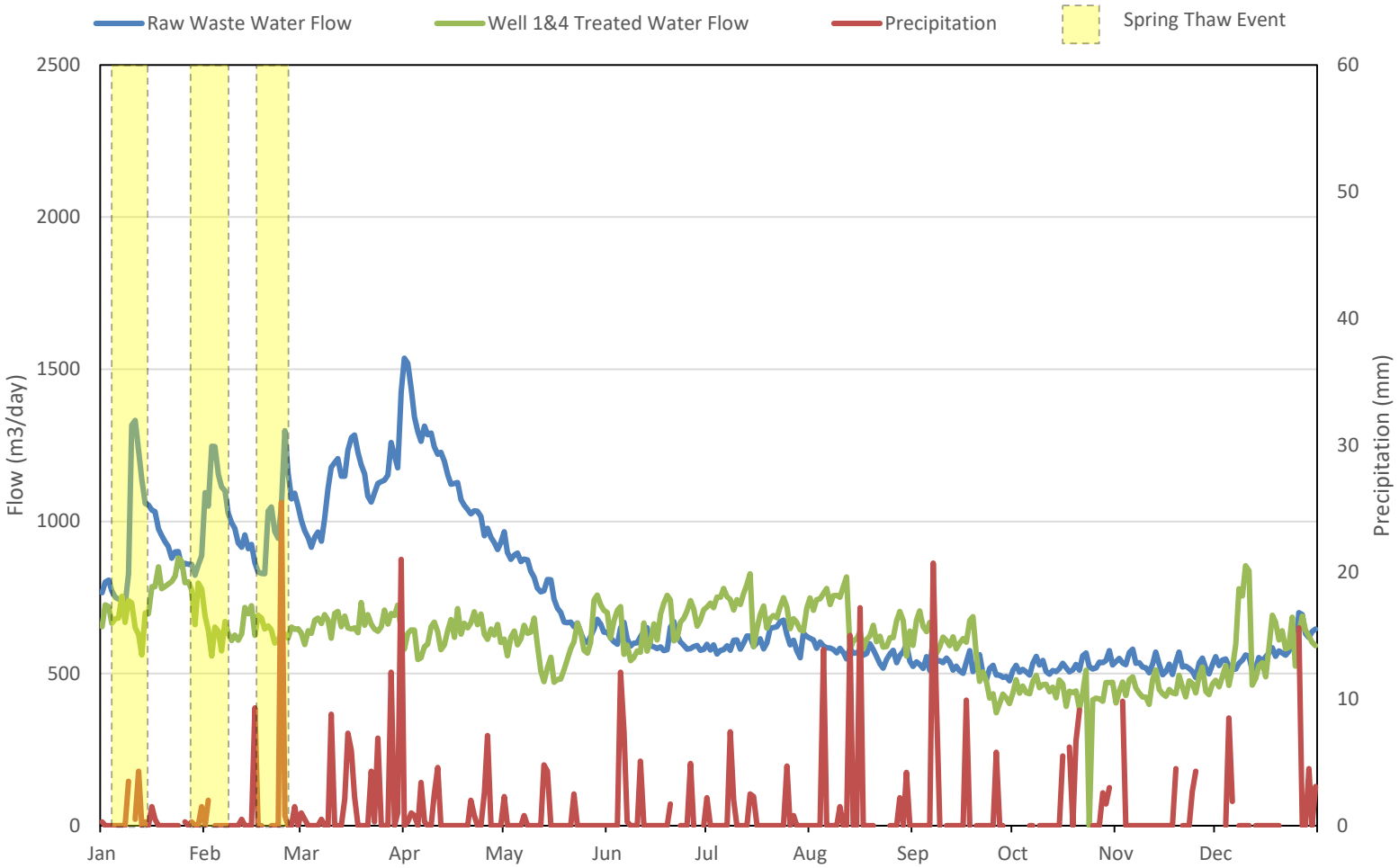
Year	Average Daily Flow (m^3/day)	Max Daily Flow (m^3/day)	% Capacity of STP
2015	688	1,235	57%
2016	741	1,536	62%
2017	959	2,155	80%
2018	1220	2,400	102%
2019	860	1,552	72%
2020	953	1,585	79%

- Flows have been increasing year over year
- 2018 was the highest year to date
- Current assumption is that plant is at 75% of rated capacity

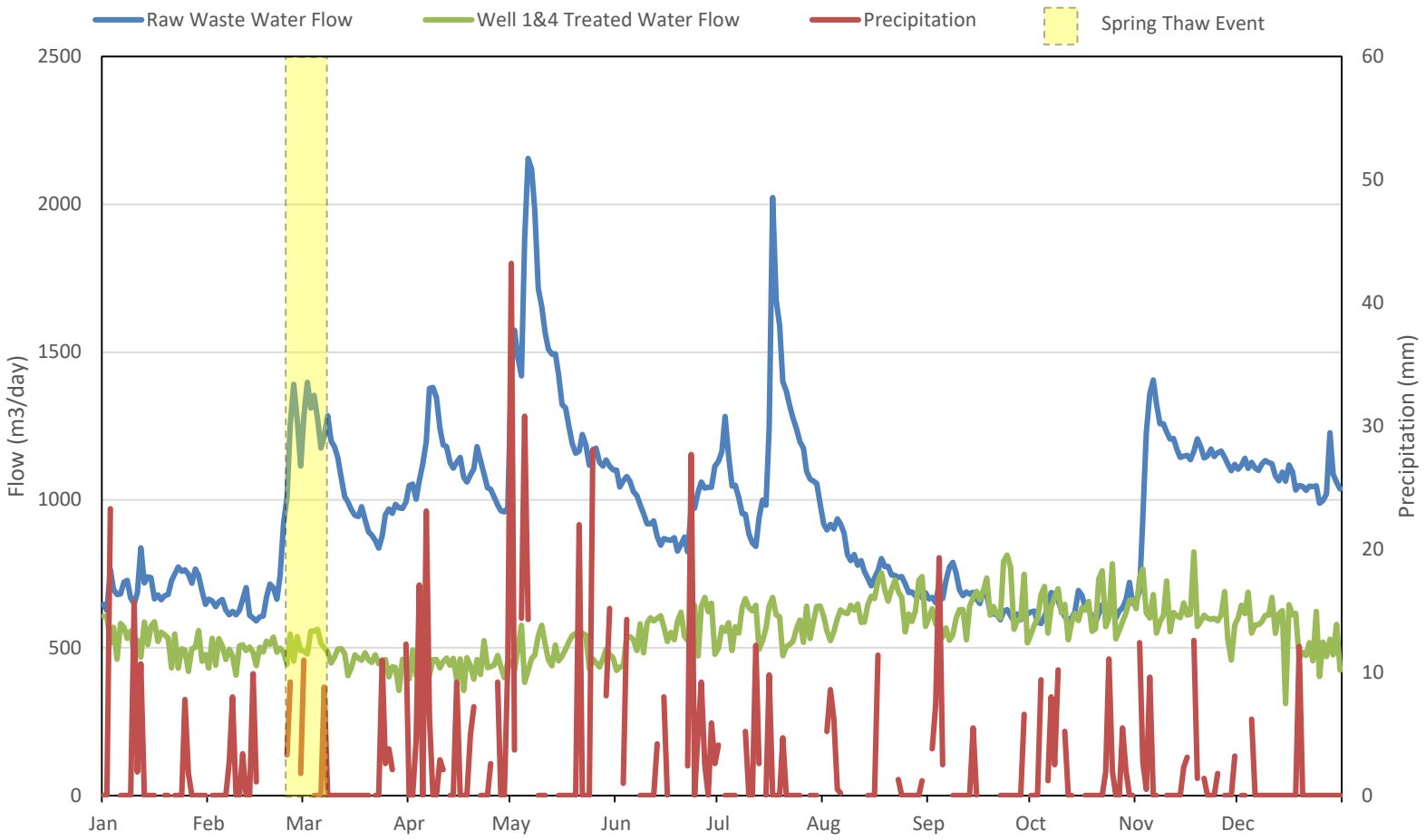
2015 Flow Data



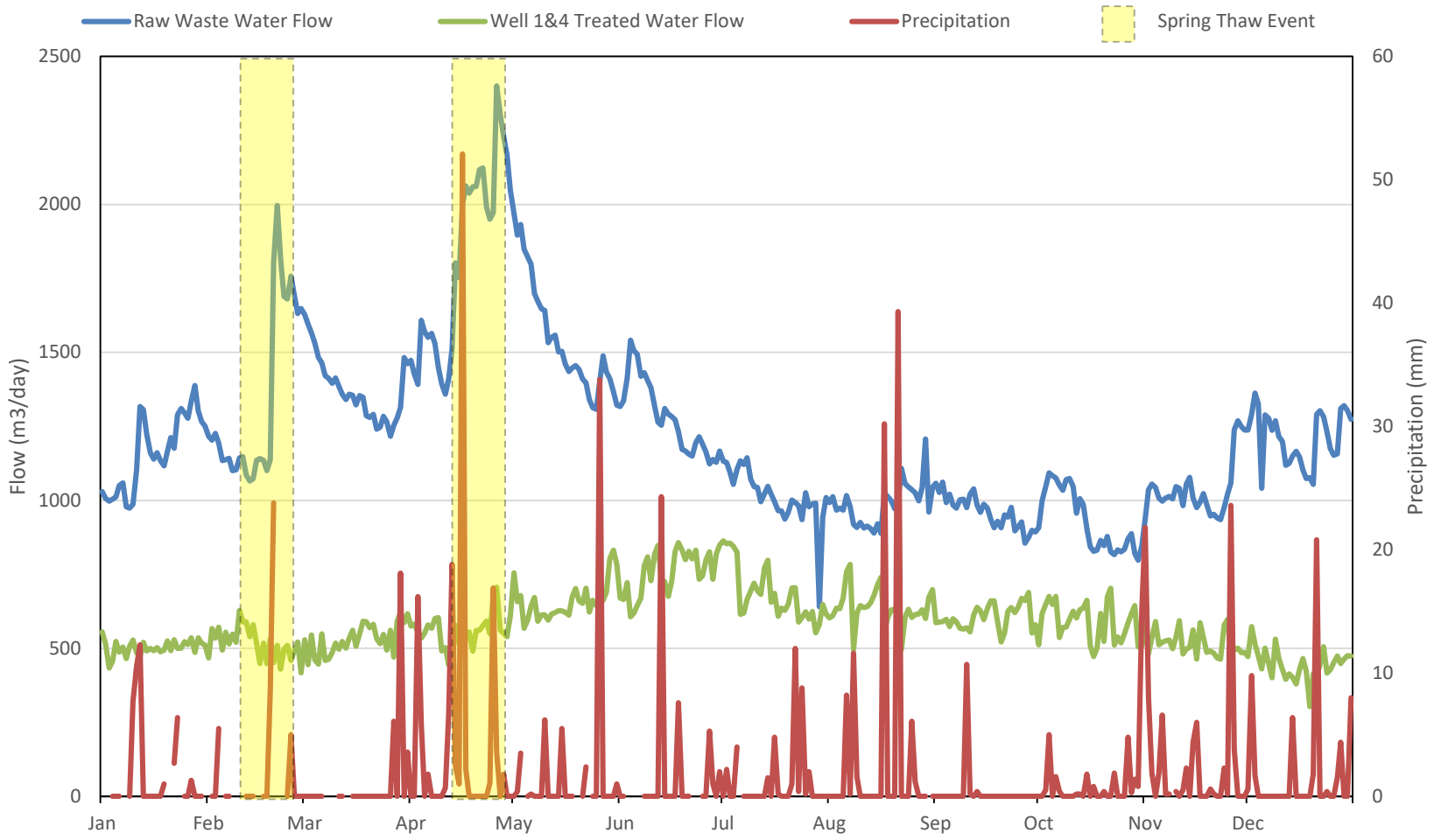
2016 Flow Data



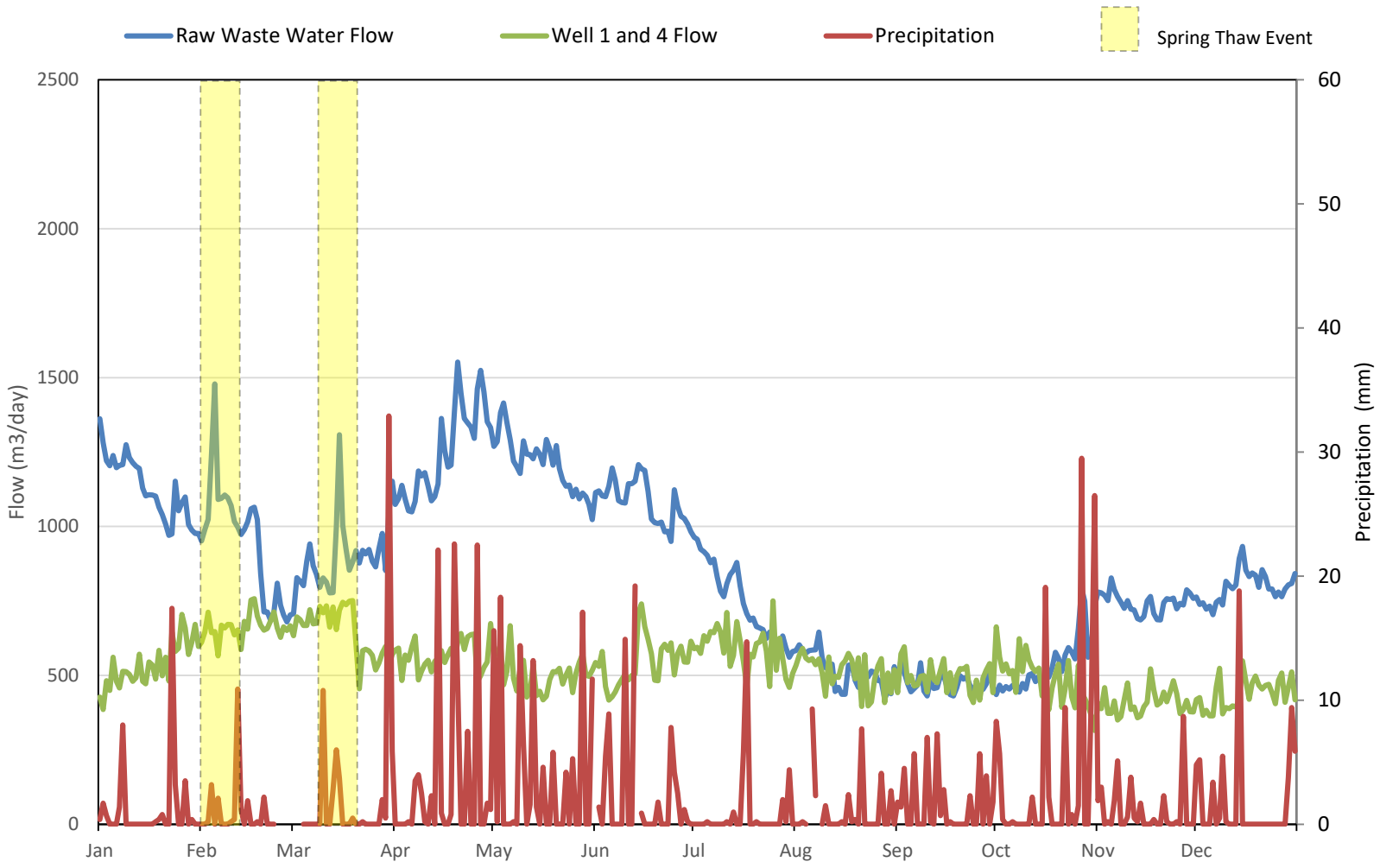
2017 Flow Data



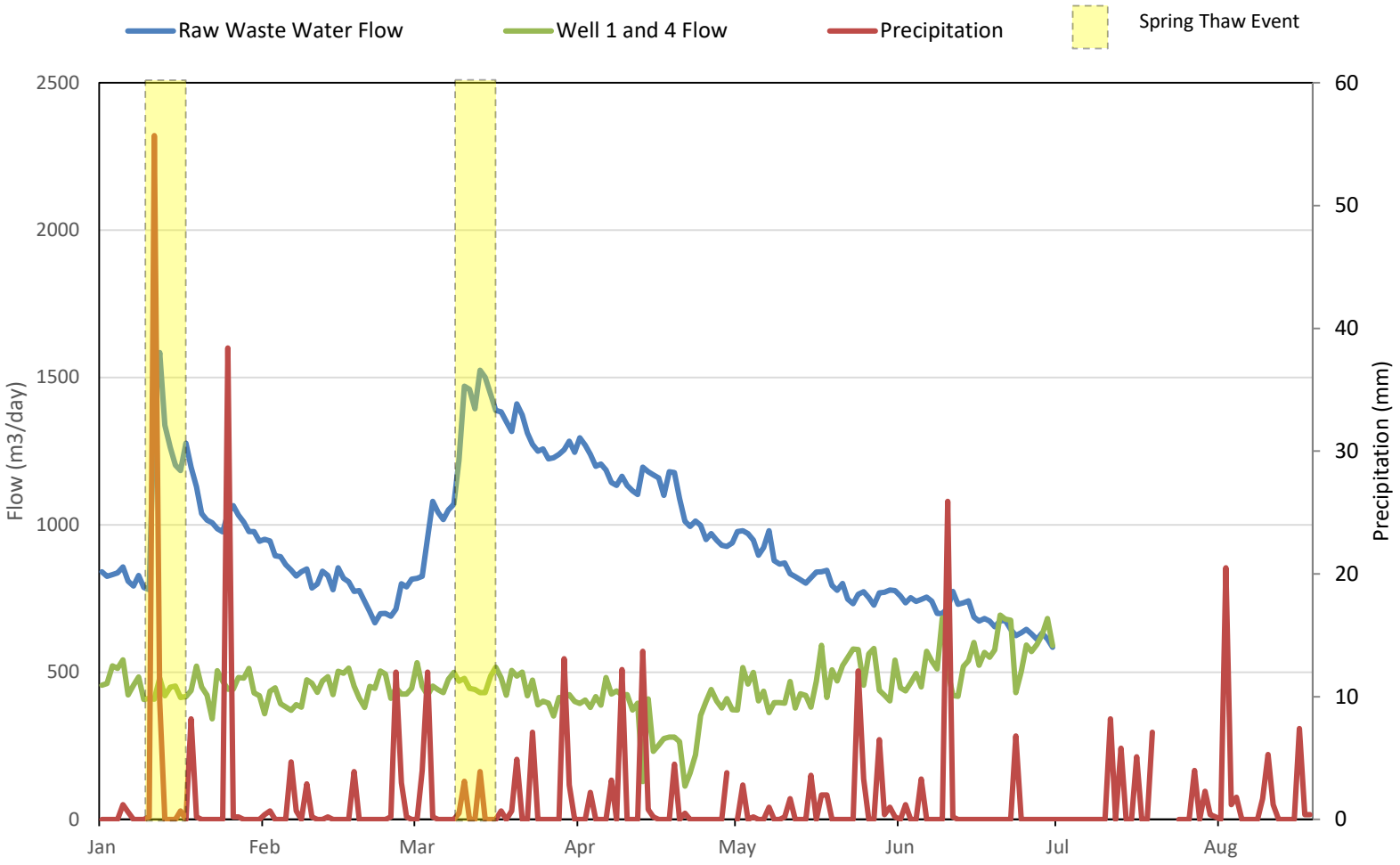
2018 Flow Data



2019 Flow Data



2020 Flow Data



Questions?