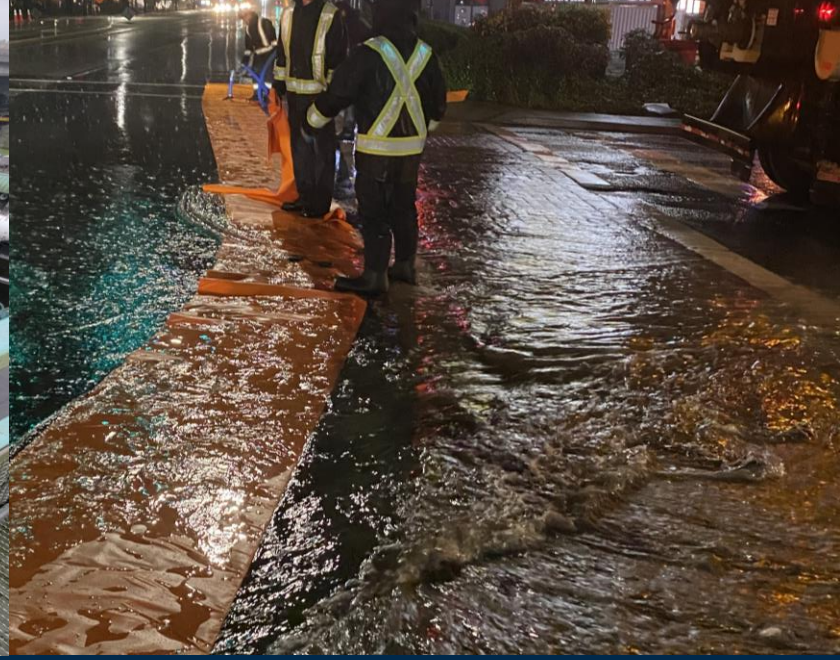

WWTP Emergency Storage / Langley SSO

Regional Wet Weather Management

LIQUID WASTE SERVICES

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Metro Vancouver Conference Day, May 12, 2023
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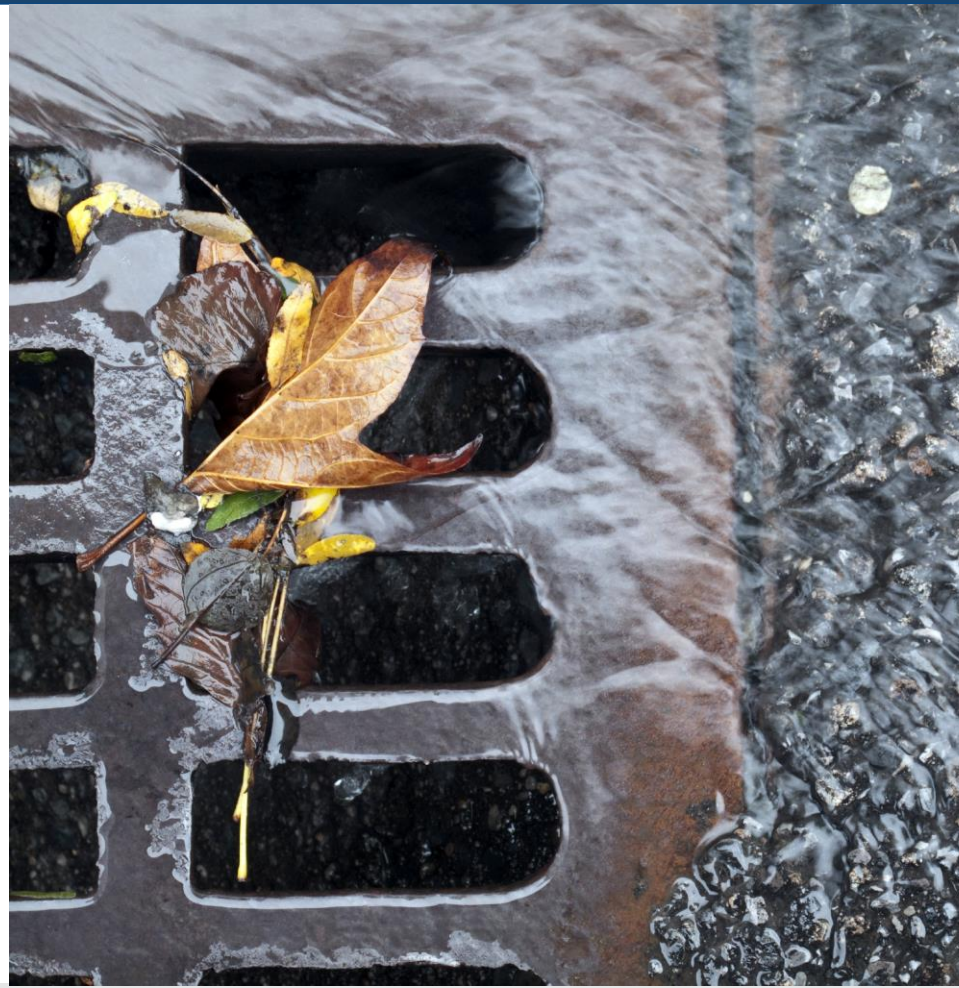
OUTLINE

1. The Why
2. Cost Apportionment
3. Case for Not Building Bigger
4. Tips to Reduce Your Levies



Part 1:

The Why

West Vancouver King Tide

CHALLENGES

Atmospheric river, November 2021

North Surrey Interceptor – Roebuck MH18A

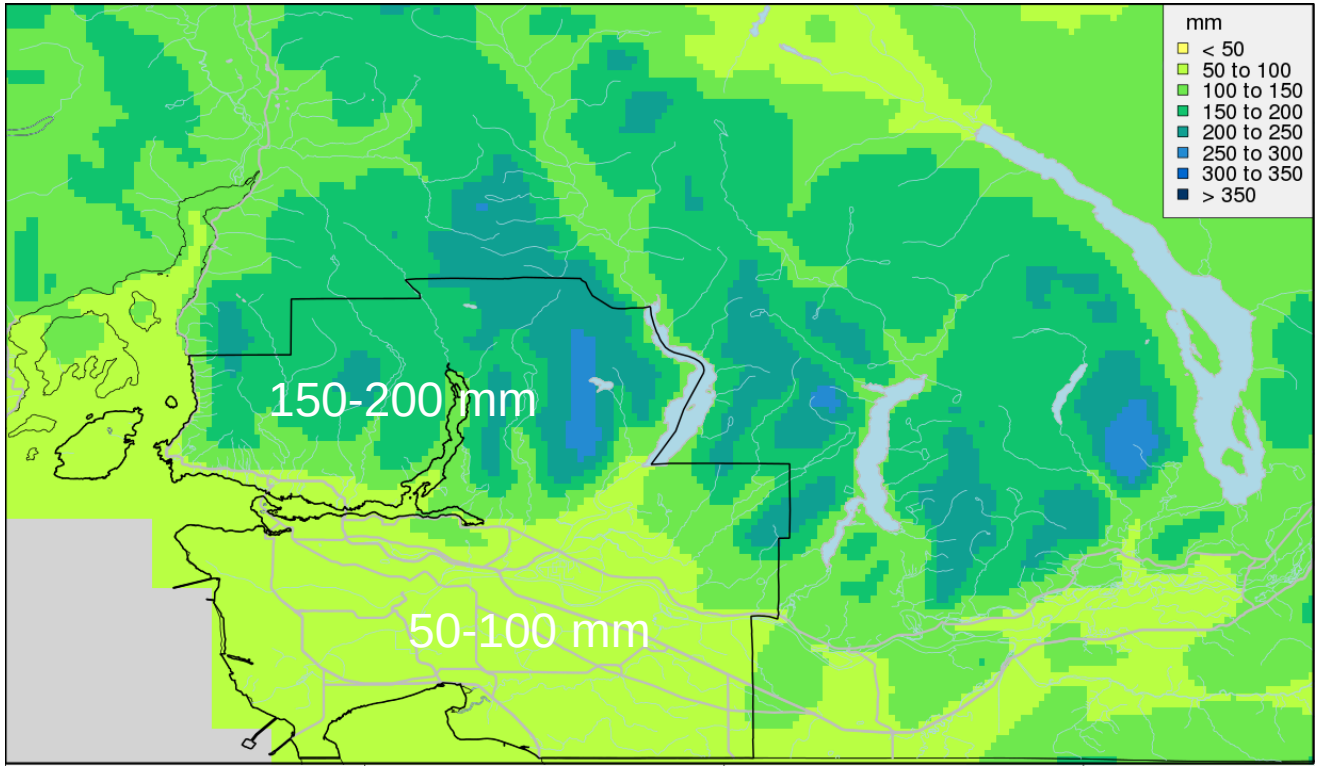
Langley Pump Station

CHALLENGES

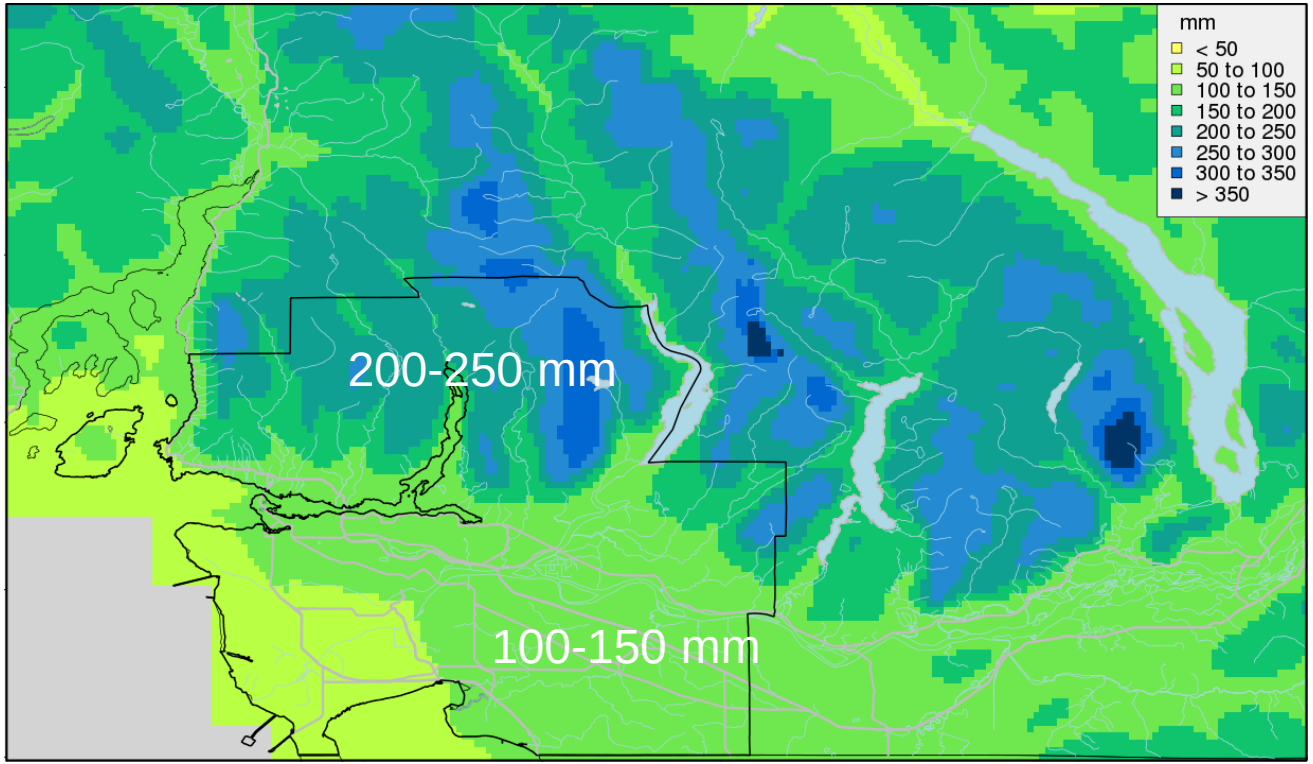
Storm surge and king tide, January 2022

Spanish Banks Pump Station

1-IN-20-YEAR WETTEST DAY PRECIPITATION (PAST)



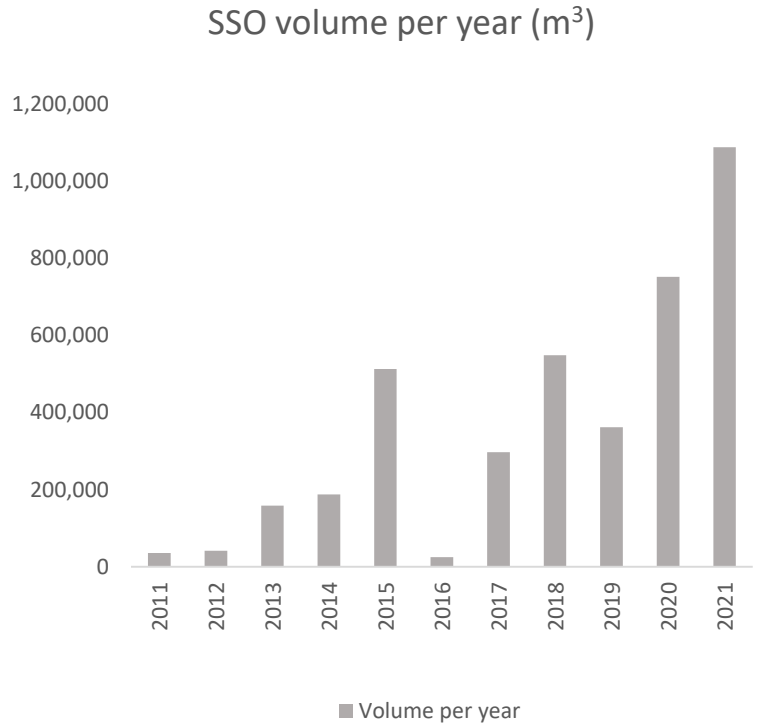
1-IN-20-YEAR WETTEST DAY PRECIPITATION (2050s)



GOAL: MINIMIZE WET WEATHER FLOWS

Direct rainwater to ground

- Public safety & environmental protection
- Eliminate regulatory non-compliance
- Build climate resiliency
- Address aging & failing assets
- Boost minimum stream flows
- Reduce costs for all



Part 2:
Cost Apportionment

West Vancouver King Tide

COST APPORTIONMENT HISTORY

Original (Pre-1990s): 100% to each Sewage Area

Regional cost apportionment principles (1990s):

- User-pay
- Benefiter-pay

Wet weather cost apportionment (starting 2024)

Growth pays for growth (via DCCs)

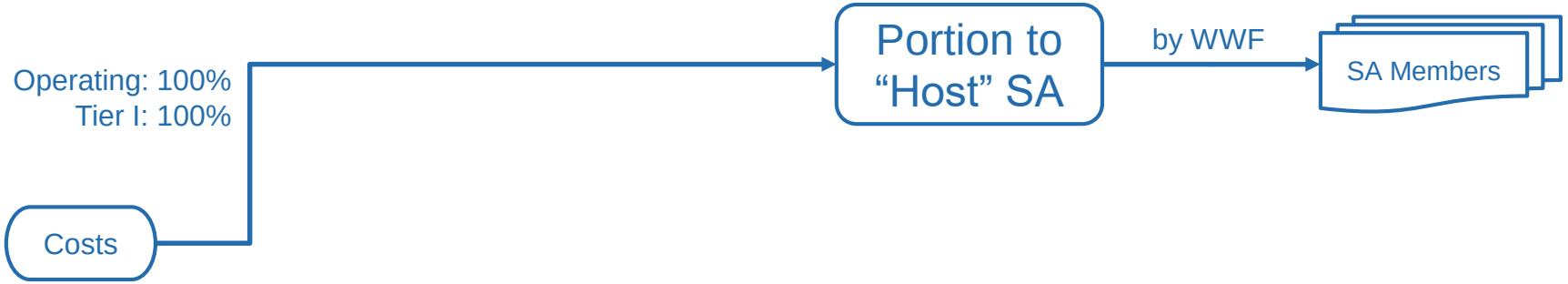
COST APPORTIONMENT BASICS

Definitions

Expenditure Category	Secondary Upgrade Related	Not Secondary Upgrade Related
Operating	All Operating Costs	All Operating Costs
Tier I	Primary + Collection System	Collection System
Tier II	Secondary	Primary + Secondary
Tier III	Tertiary + Resource Recovery	Tertiary + Resource Recovery

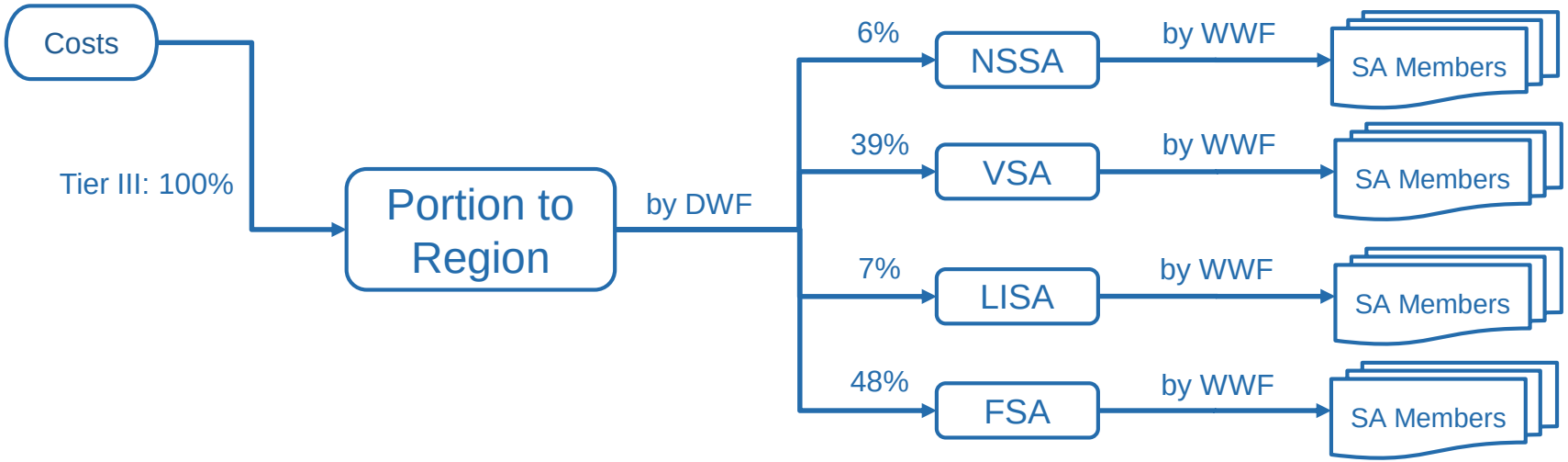
COST APPORTIONMENT BASICS

Operating & Tier I Non-growth



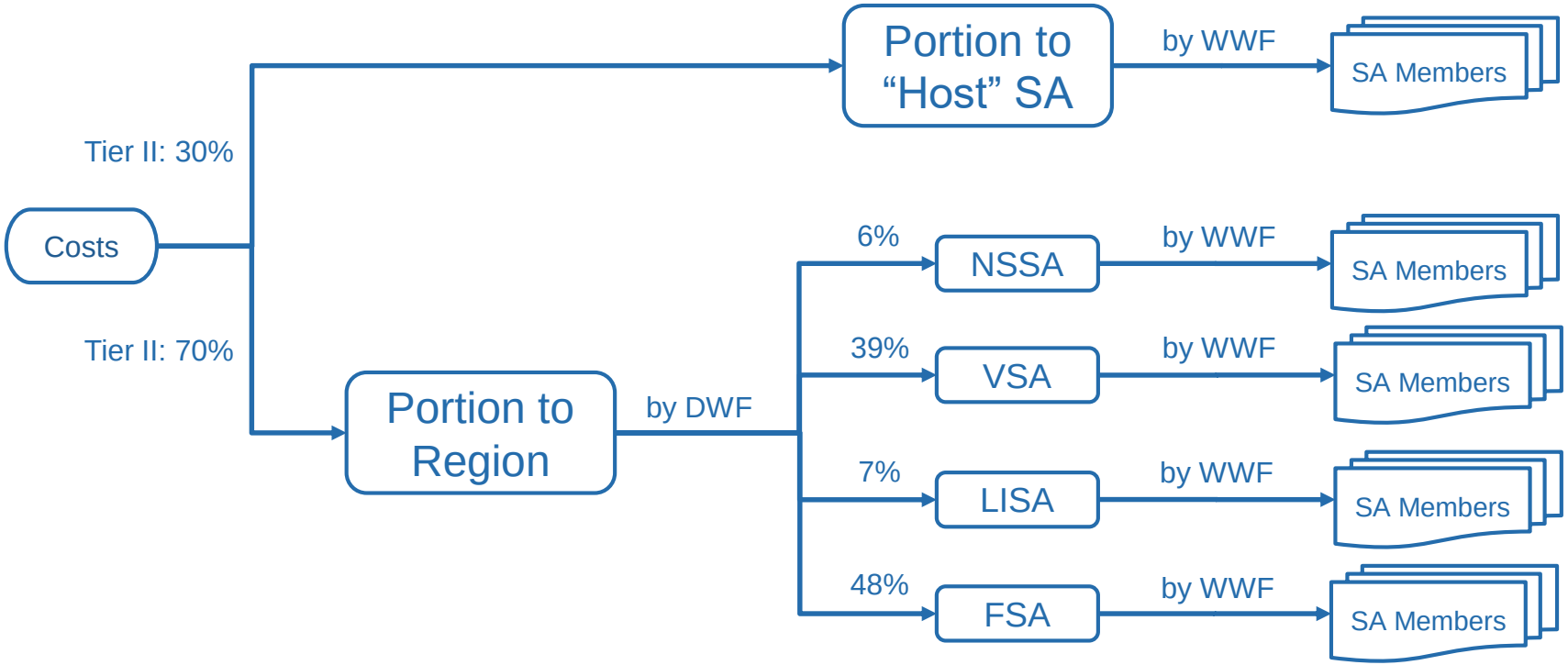
COST APPORTIONMENT BASICS

Tier III Non-growth



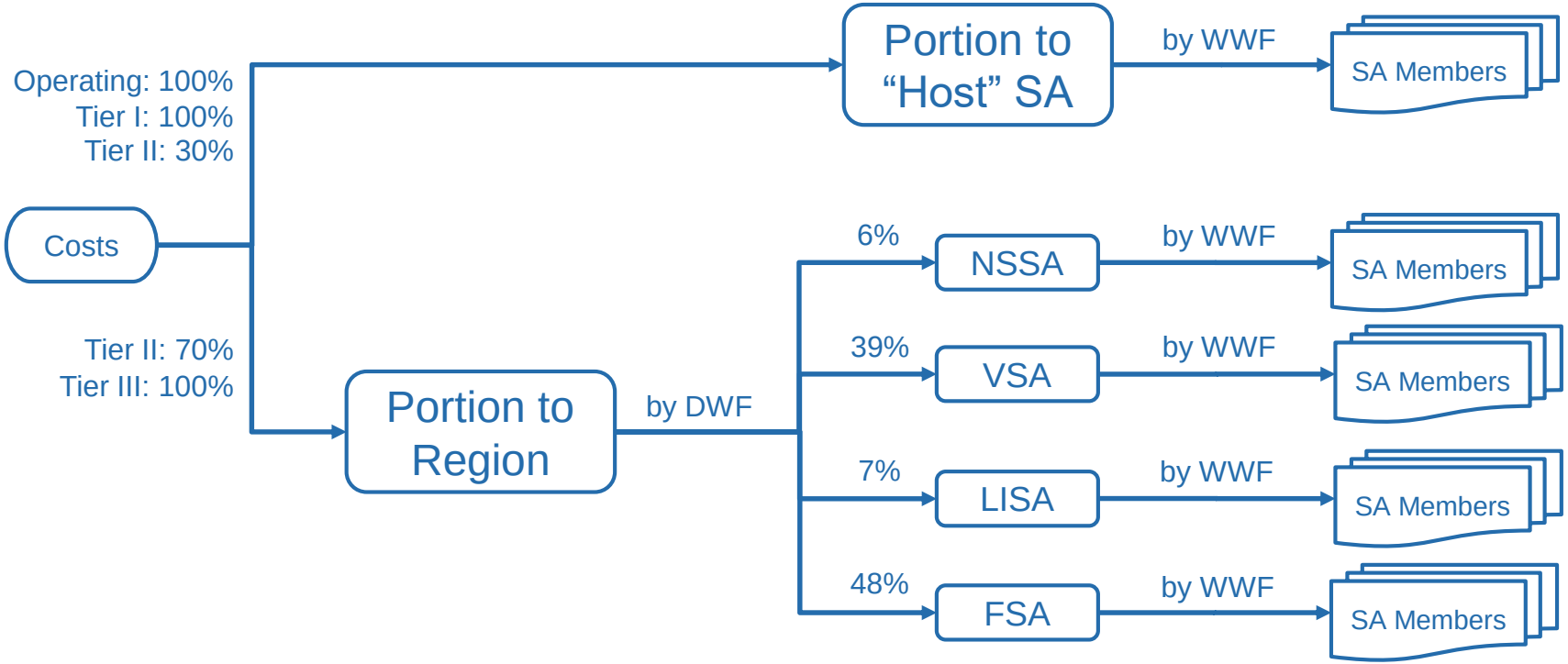
COST APPORTIONMENT BASICS

Tier II Non-growth



COST APPORTIONMENT SUMMARY

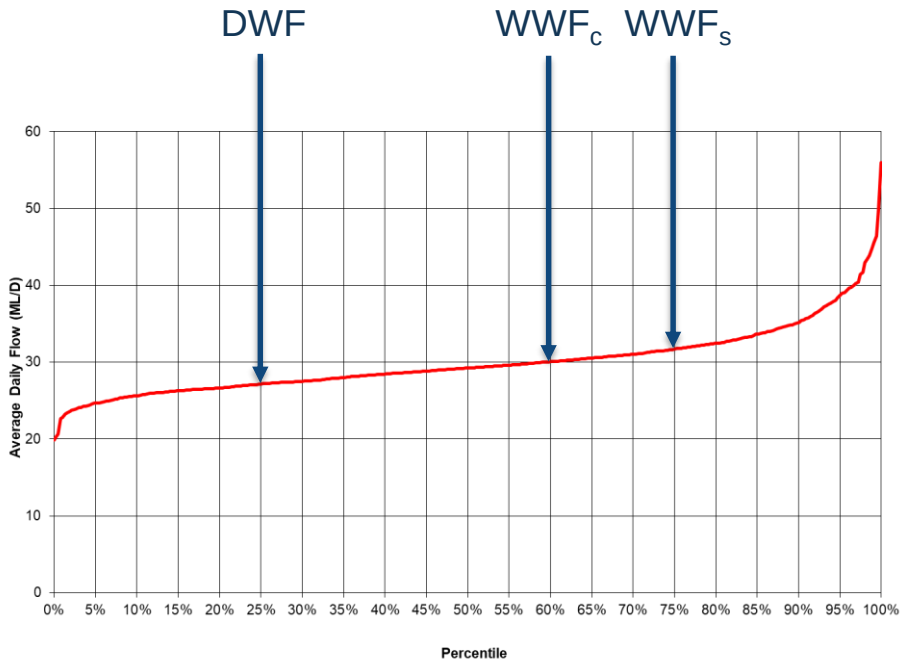
Non-growth



WET WEATHER RATE STRUCTURE

Strengthening User-pay Principle

- Separated systems
  - ► 75 percentile flow (WWF_s)
- Combined systems
  - ► 60 percentile flow (WWF_c)
- Phase-in period
  - ► 10 years
- Starting year for phase-in
  - ► Commencing with spring 2024 bills
- Periodic review of parameters
  - ► Full bylaw review proposed every 3 years



ALLOCATIONS

Indicative Estimates

GVS&DD Member	2022 Levy ($)	Future Levy* ($)	% Change over 10 yrs
City of Burnaby	29,838,017	27,660,411	(7.3%)
City of Coquitlam	13,923,535	14,131,970	1.5%
City of Delta	9,008,835	10,203,896	13.3%
City of Langley	2,040,395	2,152,036	5.5%
Township of Langley	10,344,072	9,391,084	(9.2%)
City of Maple Ridge	8,190,012	7,982,284	(2.5%)
City of New Westminster	11,225,358	11,636,236	3.7%
City of North Vancouver	7,971,747	7,165,423	(10.1%)
District of North Vancouver	13,327,918	14,094,844	5.8%
City of Pitt Meadows	1,652,675	1,423,502	(13.9%)

GVS&DD Member	2022 Levy ($)	Future Levy* ($)	% Change over 10 yrs
City of Port Coquitlam	6,076,032	6,162,431	1.4%
City of Port Moody	2,553,053	3,200,771	25.4%
City of Richmond	28,681,273	28,239,663	(1.5%)
City of Surrey	56,564,465	56,061,804	(0.9%)
University Endowment Lands	623,851	258,135	(58.6%)
UBC (non-member)	2,027,499	1,682,975	(17.0%)
City of Vancouver†	86,819,138	89,451,698	3.0%
District of West Vancouver	8,743,505	8,782,903	0.5%
City of White Rock	1,813,307	1,742,621	(3.9%)

Based on available flows

* In Year 10

Part 3:
Not Building Bigger

Photo Caption here

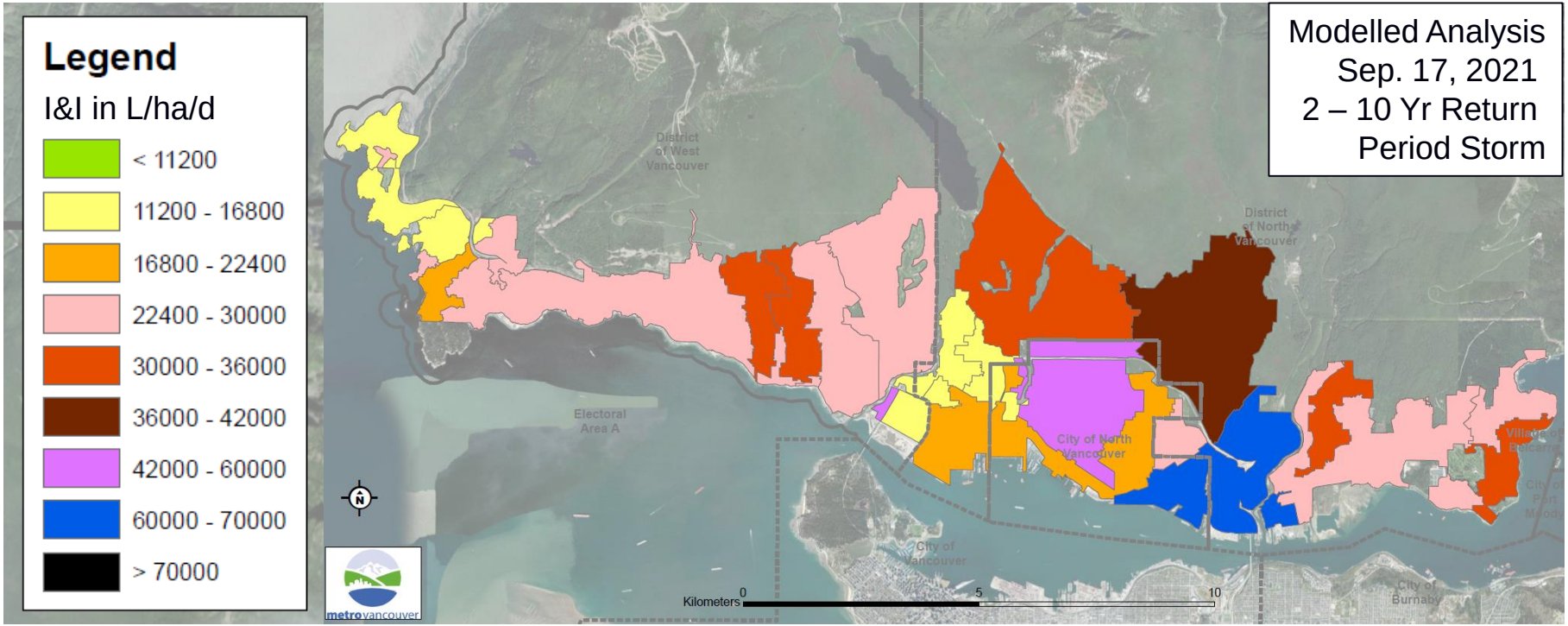
FIX LEAKY PIPES VS. CONVEY STORE & TREAT

Back-of-the-envelope analysis

- NSSA Example & Context
- Assumptions
- Comparison
- Conclusion & emerging principle

INFLOW & INFILTRATION “HEAT MAP”

North Shore Sewerage Area



LYNN CATCHMENTS

Scope and assumptions of analysis

- Blue areas: 560ha; 645 properties
  "Excess" I&I = 49,600 L/ha/d or 27.8 MLD

Fix Leaky Pipes	Convey & Treat	Store
Fix rate: Up to 20% of private properties; 2% of public / private interface	7.1 - 8.5 km "twinning" Lynn to NS WWTP	Required storage: 19,000m^3
Includes additional: testing CCTV repair mgmt.	Prelim. + Primary capacity (exclude Secondary, Outfall)	

- Assumptions: modelling, cost-curves

COMPARISONS

Back-of-the-envelope analysis

Fix Leaky Pipes		Convey and Treat		Store
Laterals	$700k - $1M	Convey	7.1 km @ $58M 8.5 km twin @ $75M	19,000 m^3 @ $48M
Municipal Sewers	$21M	Treatment	$13M	
Sum	$22M	$71M - $88M		$48M
Unit Costs	*$440 L/ha/d*	*$2.5M - $3.2M / MLD*		*$2,500 / m^3*

NORTH SHORE WWTP

Space Constrained Site

PROPOSED PRINCIPLE

- Fixing leaky pipes:
  - least cost; preserves capacity for growth
  - improves system resiliency
  - public & environmental health benefits

- Proposed principle:

  Prioritize fixing leaky collection systems over expanding conveyance, storage & treatment capacity

Part 4:
Tips to Reduce Your Levies

TARGET INFLOW FIRST

Subdivisions “not acting their age”

- Stormwater Inflow (SWI)
  - Deliberate or accidental connection of catch basins, roof leaders, lawn basins, clean-out caps, etc.
- Identified through:
  - Summer / early fall flow analysis
  - Smoke and dye testing
  - CCTV camera
  - (Section 4.4 – KWL template)

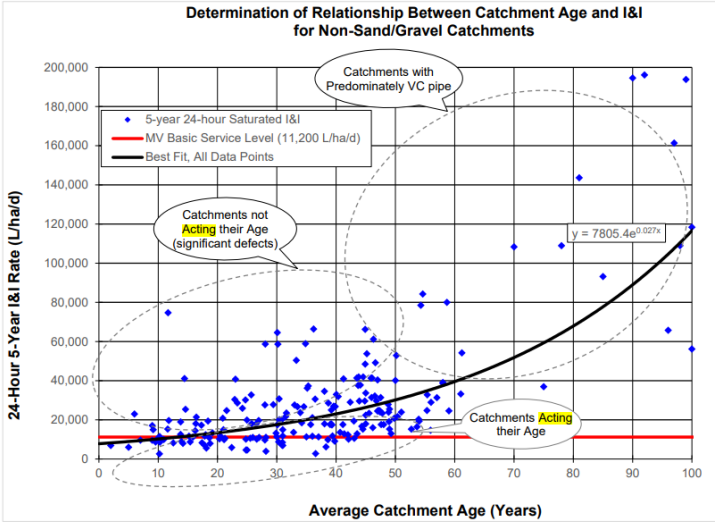
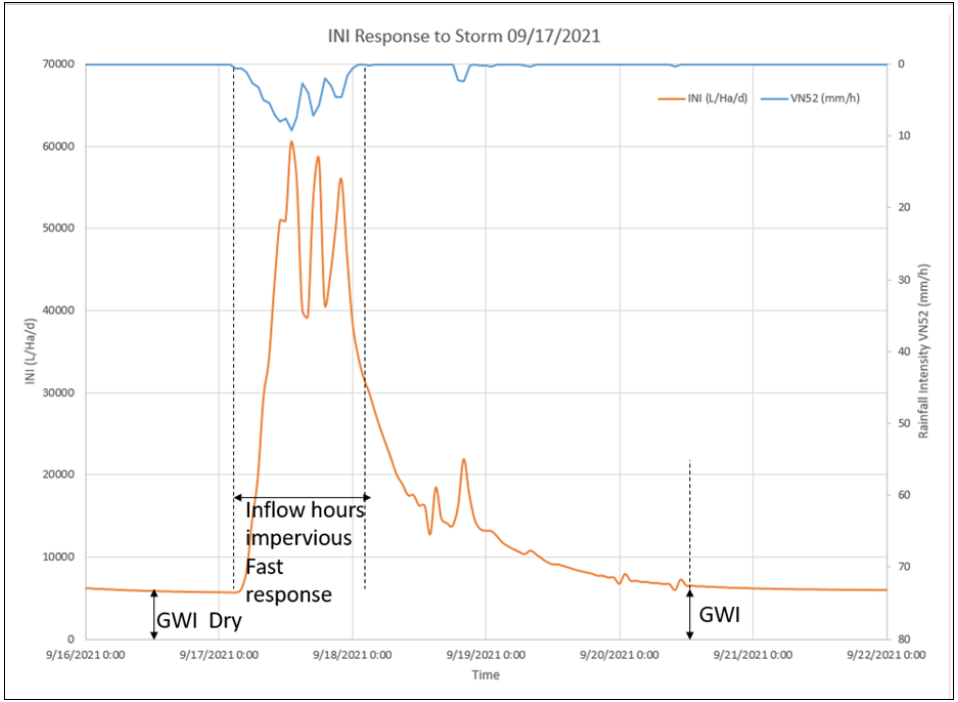


Figure 2-4: Updated 2021 I&I Versus Catchment Age Relationship

TARGET INFLOW FIRST

Analyze data for inflow

- Use “first storm”
- Filter-out infiltration data
- Do ***inflow*** analysis
- Produce inflow-centric heat maps



Inflow analysis using first storm after long dry periods

5 STEPS TO REDUCE COST ALLOCATION IMPACTS

Target inflow before infiltration

1. Establish monitoring and identify priority catchments, prioritizing private lateral inflow
2. Develop and deliver general communication initiatives; target messaging for priority catchments
3. Inspect and prioritize actions – public and private system
4. Establish and implement rehabilitation / diversion programs
5. Measure and track results

TIPS AND SUPPORT

- Key municipal actions:
  - Existing laterals – Follow the five steps
  - New laterals - Inspect and enforce standards
- Regional support:
  - Expand inflow analysis?
  - Enforcement guidelines?
  - Regional equity guidelines for lateral grants?
  - Regional engineering guidelines for laterals?

Discussion

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