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**Electoral Area E**  
**(Nanoose Bay Peninsula Water Service Area)**  
**Water Update Meeting**  
Feb. 18<sup>th</sup> 2016, Nanoose Place

# Agenda

## 7:15 Presentations

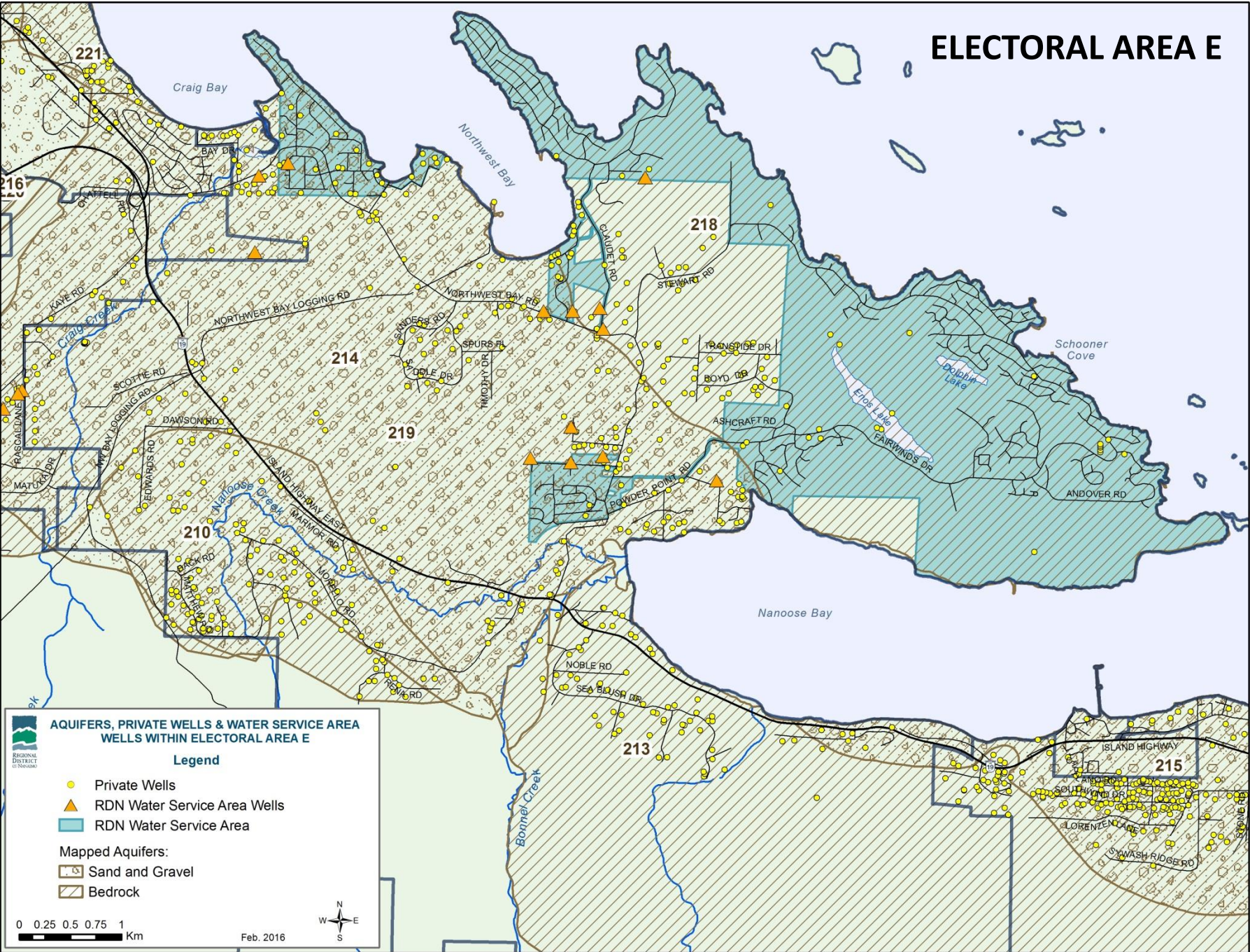
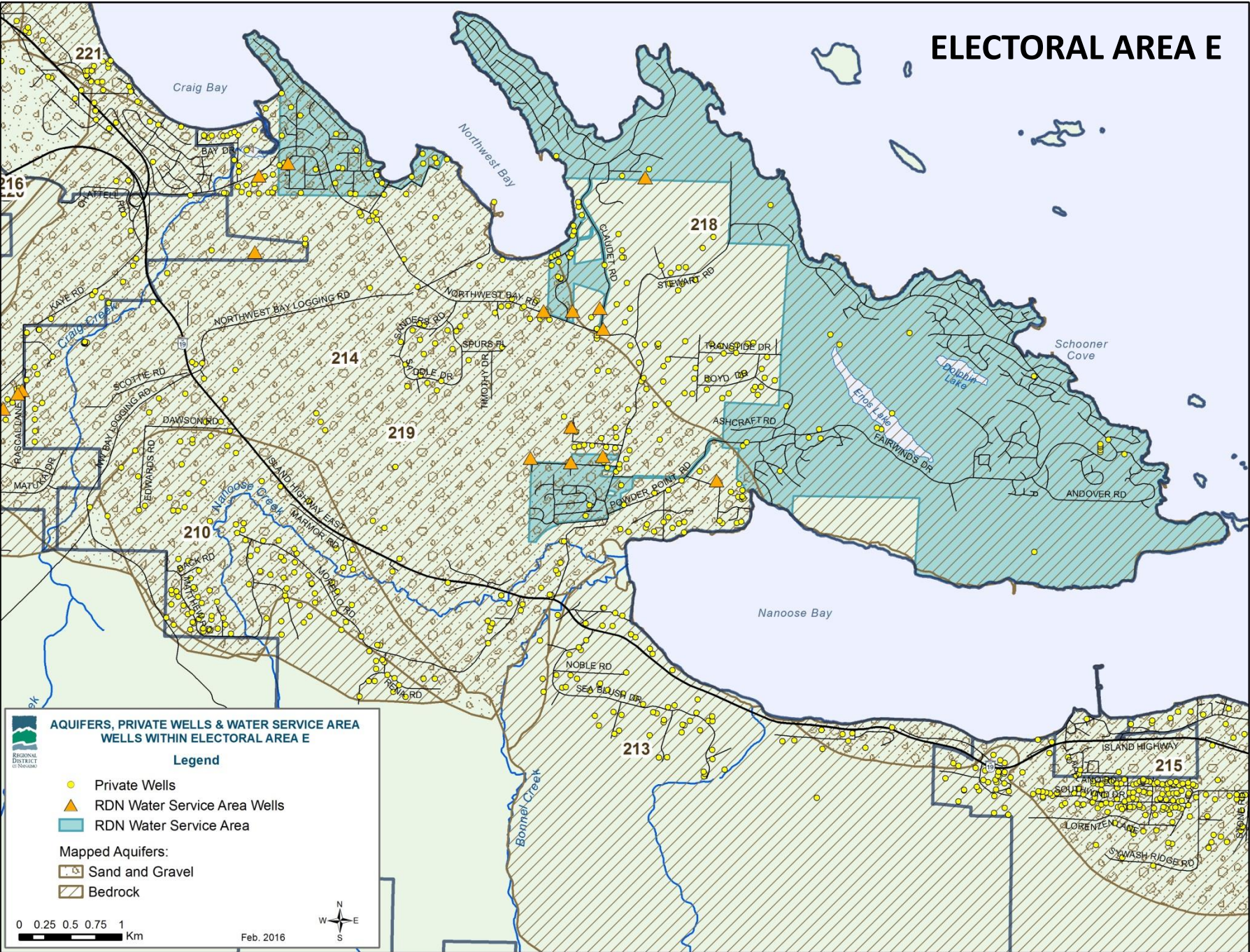
- ERWS / ASR (Mike Donnelly)
- Parker Road Well & Monitoring (Mike Donnelly)
- Capital Projects (Gerald St. Pierre)
- Area E Water Monitoring (Julie Pisani)
- Water Conservation Efforts (Julie Pisani)

## 8:00 Comments and Feedback

## 8:20 Breakout Session

## 8:45 Summary and Wrap-up

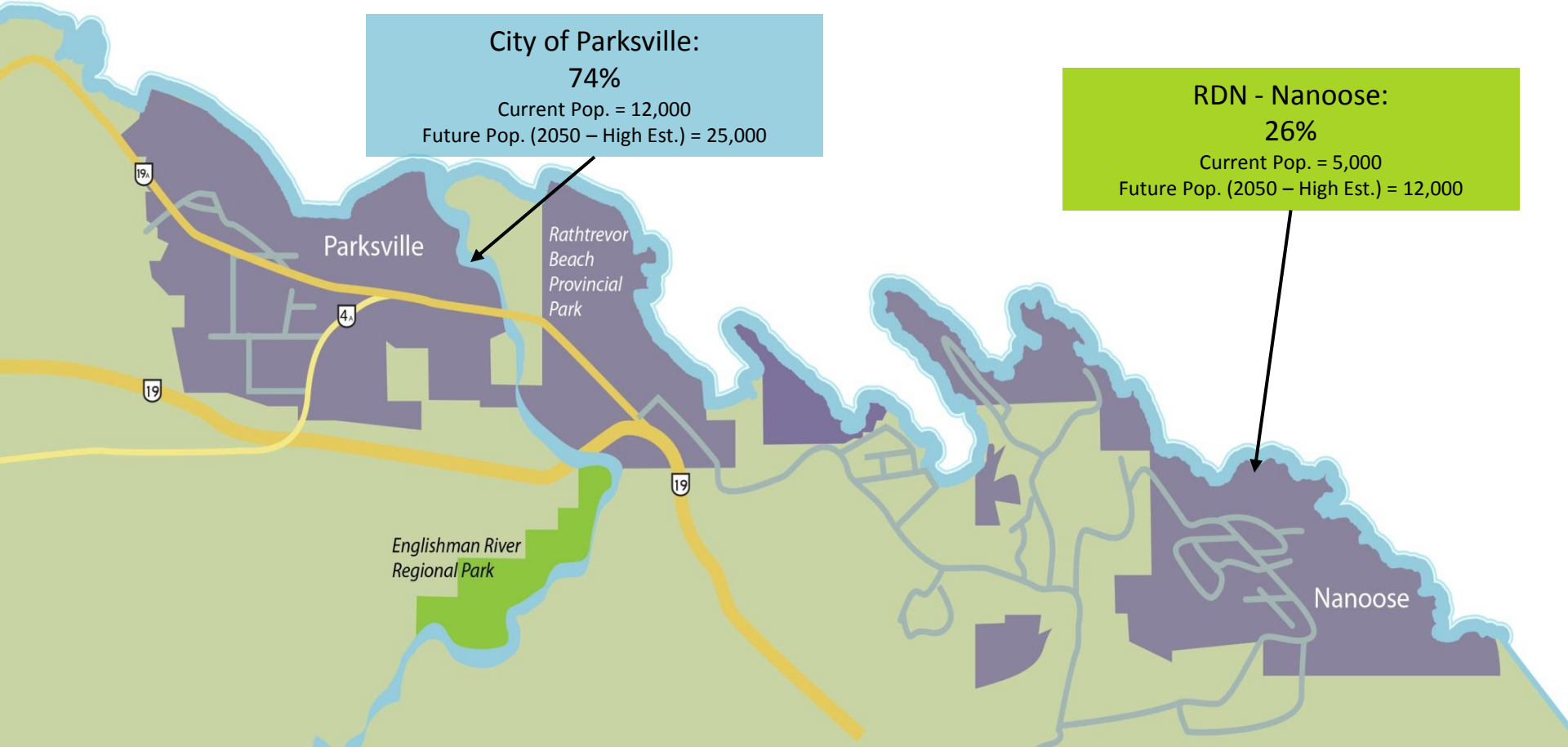
# ELECTORAL AREA E



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# Englishman River Water Service

# Englishman River Water Service Partners

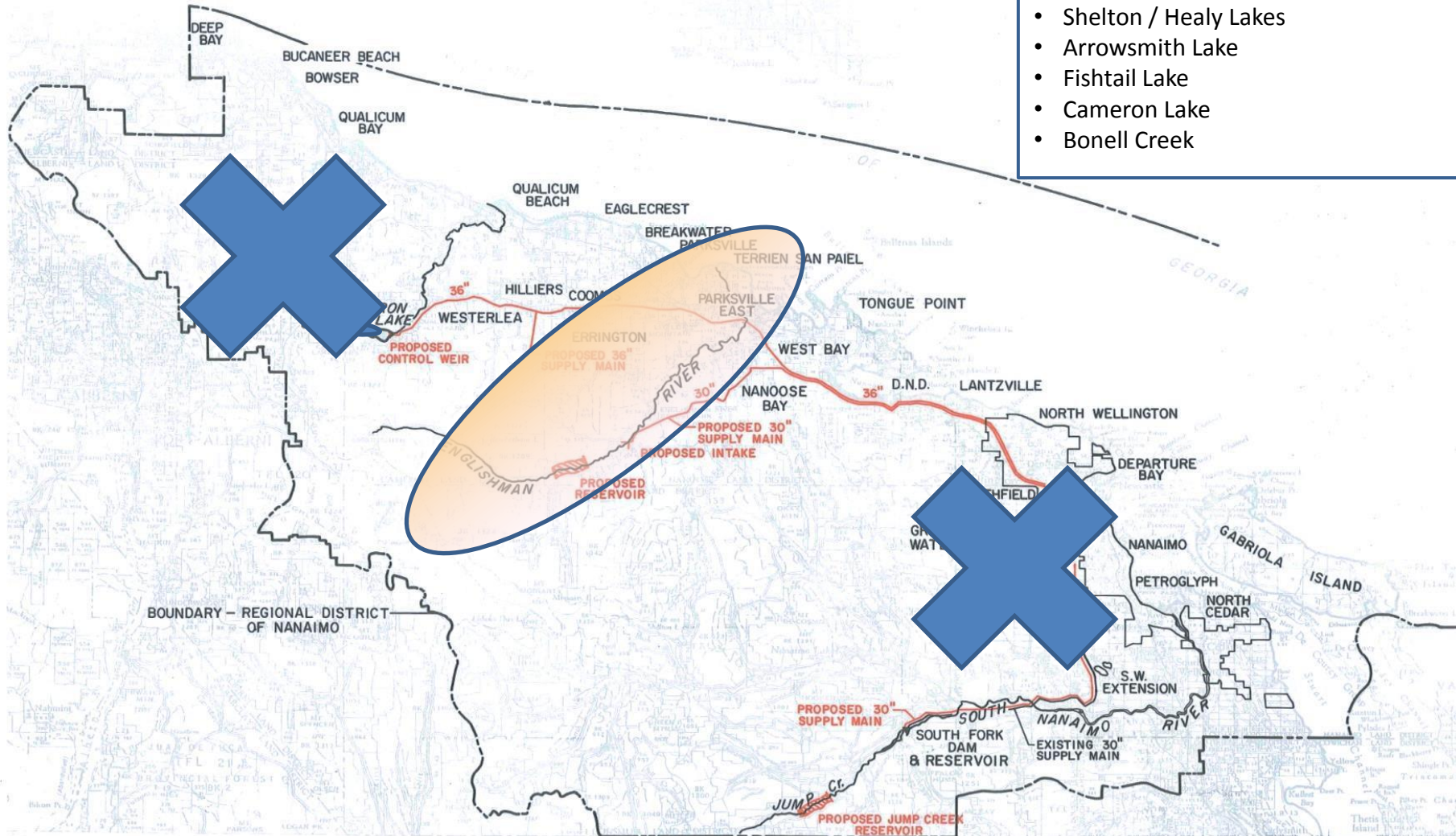


City of Parkville:  
74%  
Current Pop. = 12,000  
Future Pop. (2050 - High Est.) = 25,000

RDN - Nanoose:  
26%  
Current Pop. = 5,000  
Future Pop. (2050 - High Est.) = 12,000

# Regional Water Supply Historical Context

- Storage Options:**
- Many source and storage options were reviewed including:
- Hidden Lake
  - Mid Englishman River
  - Shelton / Healy Lakes
  - Arrowsmith Lake
  - Fishtail Lake
  - Cameron Lake
  - Bonell Creek



The Province directed the region to consider the Englishman River as a single source of surface water supply for future domestic water needs and fisheries enhancements.

# Arrowsmith Dam Construction

Commissioned in 2000 / 2001

Storage = 9 million m<sup>3</sup>

Typical Operational Period:

**May to October**



Arrowsmith Lake Reservoir



Arrowsmith Dam



Arrowsmith Dam – Control Station





*Arrowsmith Lake Reservoir (June 2013) - looking south*

# History:

Phase One - Storage (complete)

Phase Two - New Intake

Phase Three - Treatment

Existing Intake

Water Treatment

Nanose Bay (RDN)

New Intake Location

Town of Qualicum Beach

City of Parksville

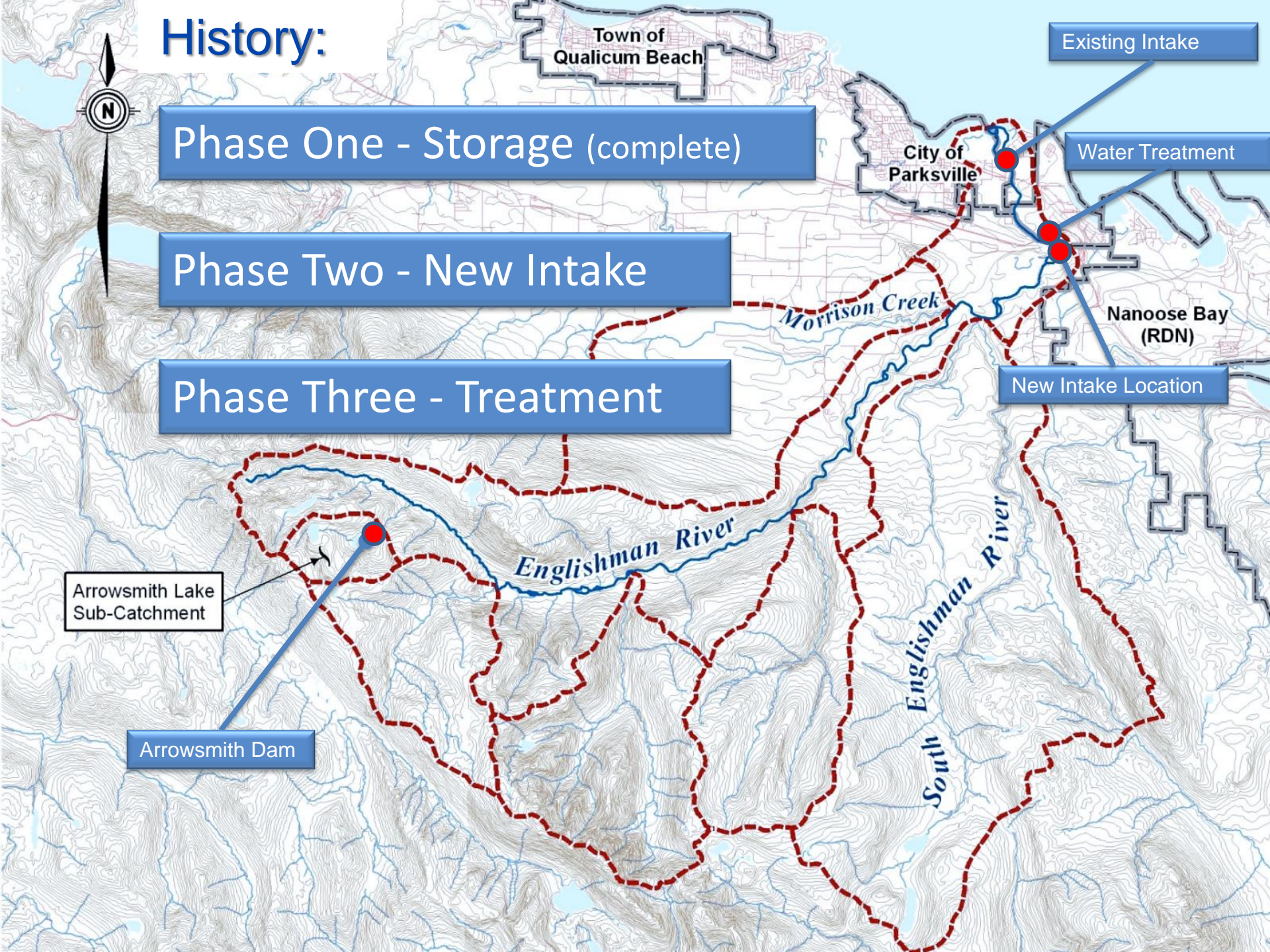
Morrison Creek

Englishman River

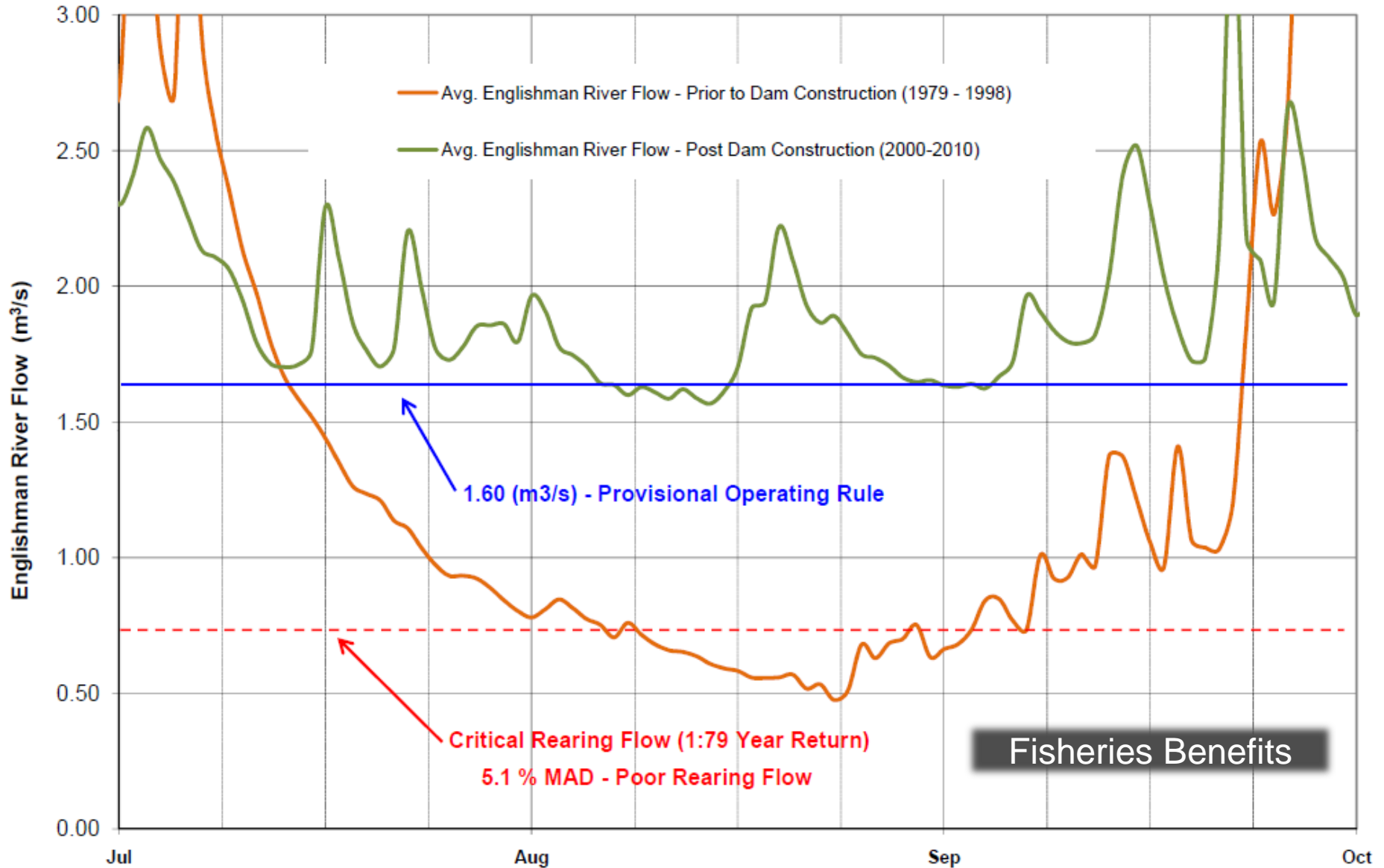
South Englishman River

Arrowsmith Lake Sub-Catchment

Arrowsmith Dam



# Englishman River Flow - Before and After Dam Construction



Note: All Flow Data from Water Survey  
Canada Hydrometric Gauge 08HB002  
Located at Bridge on Hwy 19A

# Why do we need Water Treatment?

Condition 6.

**To be constructed by December 31, 2016**

In accordance with VIHA 4321 treatment policy for the Englishman River water source, provide finished water quality using technology that will achieve the following performance standard; a 4-log removal/inactivation of viruses, a 3-log removal/inactivation of Giardia cysts and Cryptosporidium oocysts, provide two treatment processes and produce finished water with less than 1 NTU turbidity.

In consultation with, and in reference to the City of Parksville letter dated February 4, 2009 (Your file 5600-10-AWS), the City of Parksville is required to meet the following implementation plan:

May, 2009: Obtain the services of a professional engineering firm to develop a conceptual plan and preliminary design for a water intake and treatment facility.

November, 2010: Conceptual plan and preliminary design is completed.

December, 2013: Detailed design of the new intake and treatment facility is completed.

January, 2015: Construction for the water intake and treatment facility commences with completion scheduled for **December 31, 2016**.

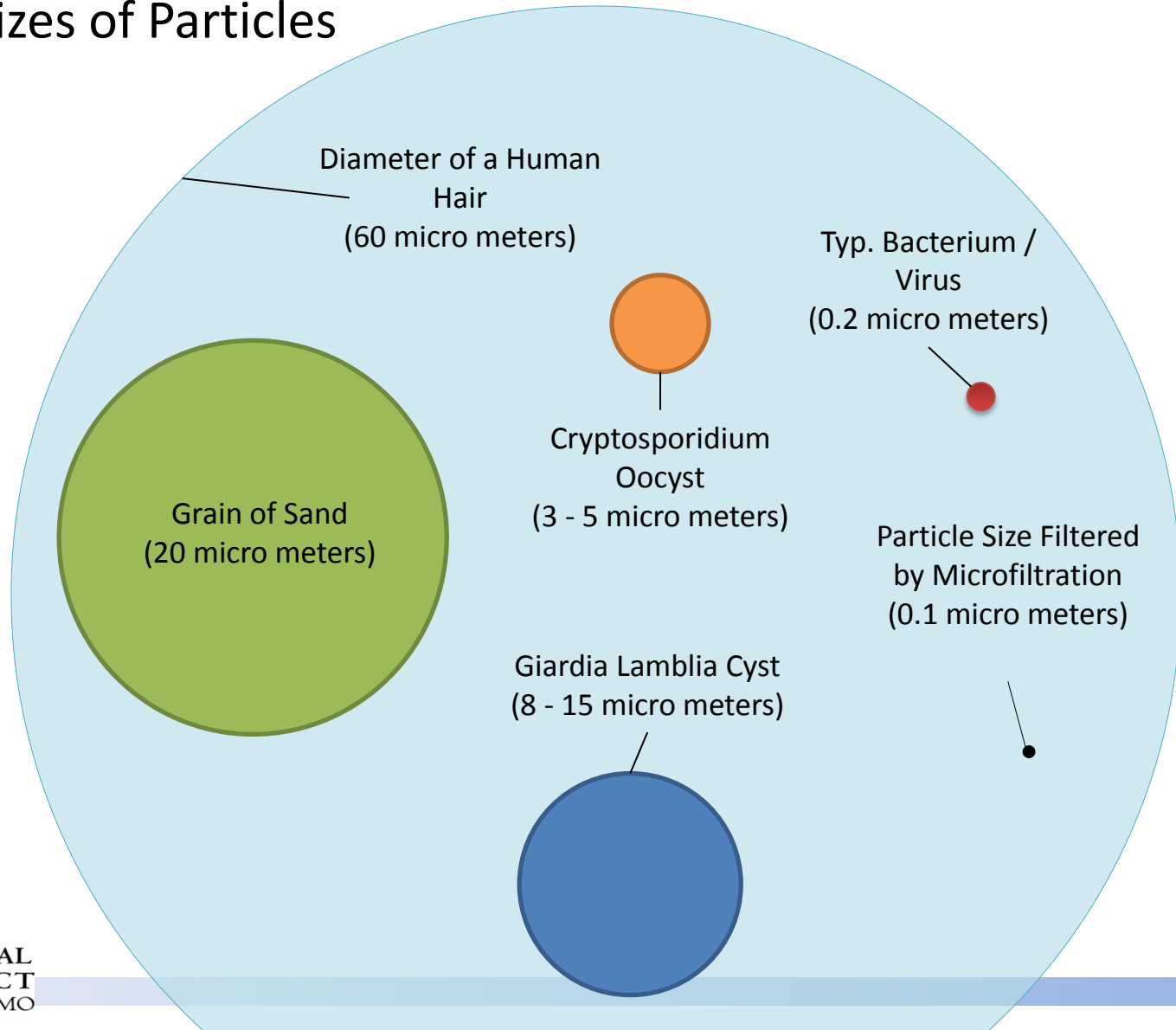
Date:

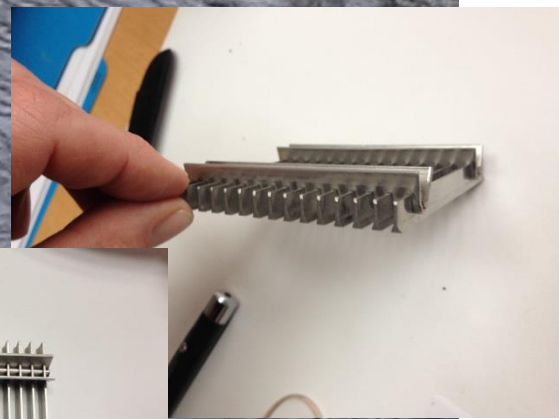
April 24, 2009

B. W. Weirall

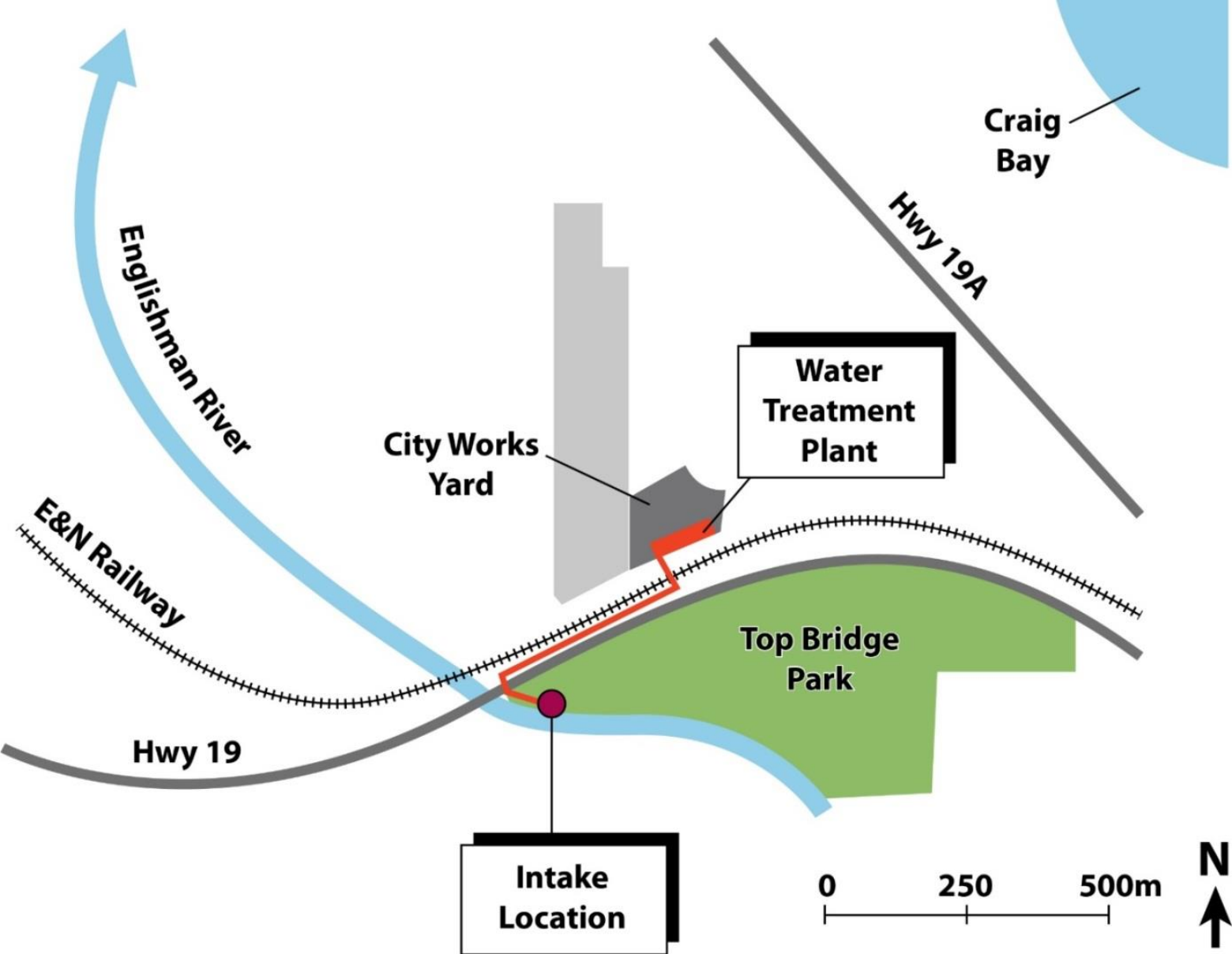
# Why do we need Water Treatment?

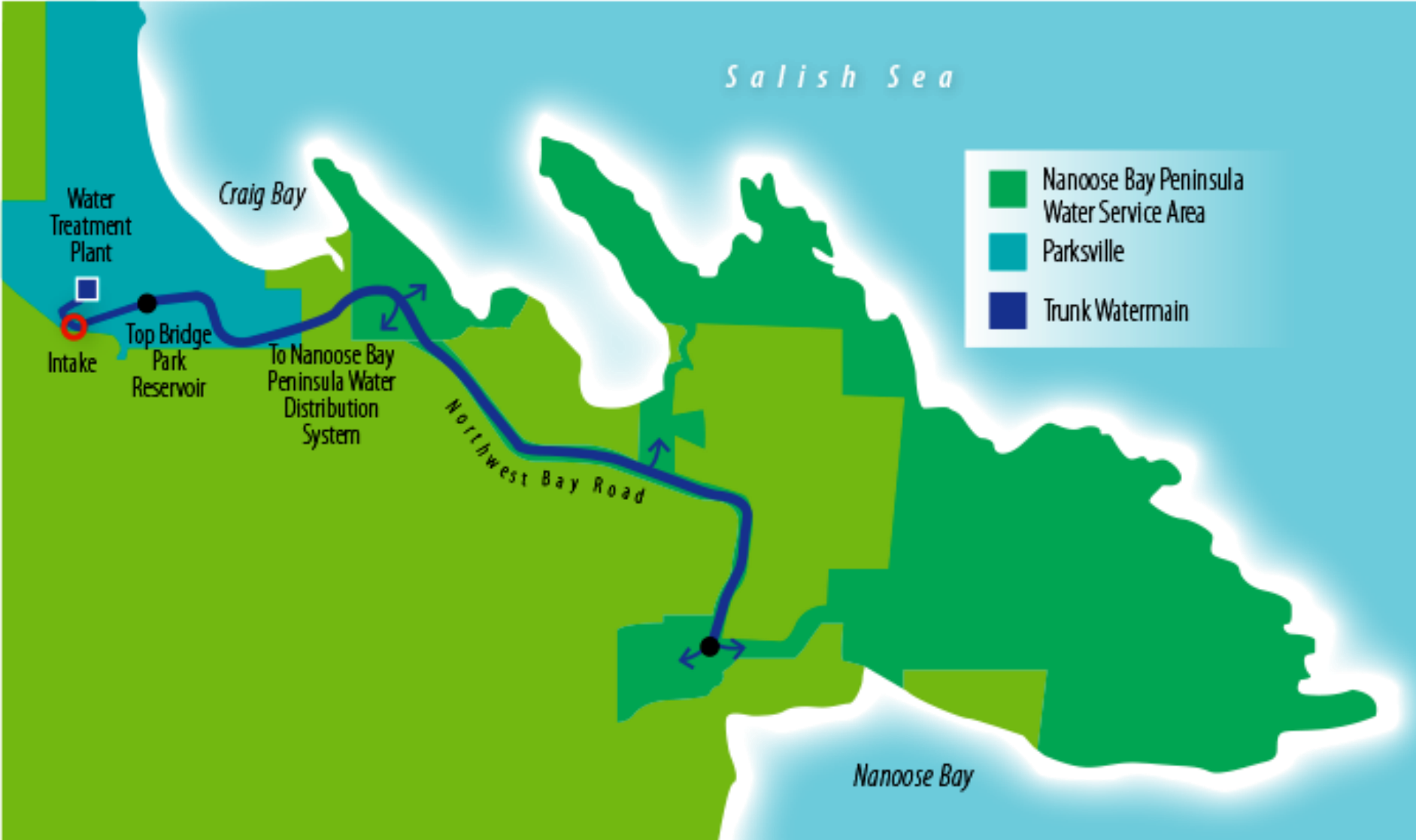
## Relative Sizes of Particles





# Intake Location:







# ERWS Costs

- \$28.3 million total
- Nanoose Bay Peninsula Water Service Area share is \$7.7 million
- 66% paid for by development (Development Cost Charges)

# Next Steps

- Department of Fisheries and Oceans approval on the river intake – pending consultation with First Nations
- Detailed design underway
- Tender: 2016
- Construction: 2016 – 2018
- Project completion: September 2018

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# Aquifer Storage & Recovery

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Objectives of ASR projects are to:

- **Store water when it is readily available**
- **Recover water during dry or high demand periods**

# Benefits of ASR

- Delays expansion of the treatment plant
- Reduces demand on the river in the summer
- Utilizes abundance effectively
- Buffer against climate change impacts
- Less expensive than surface storage options
- Balances annual treatment plant operations

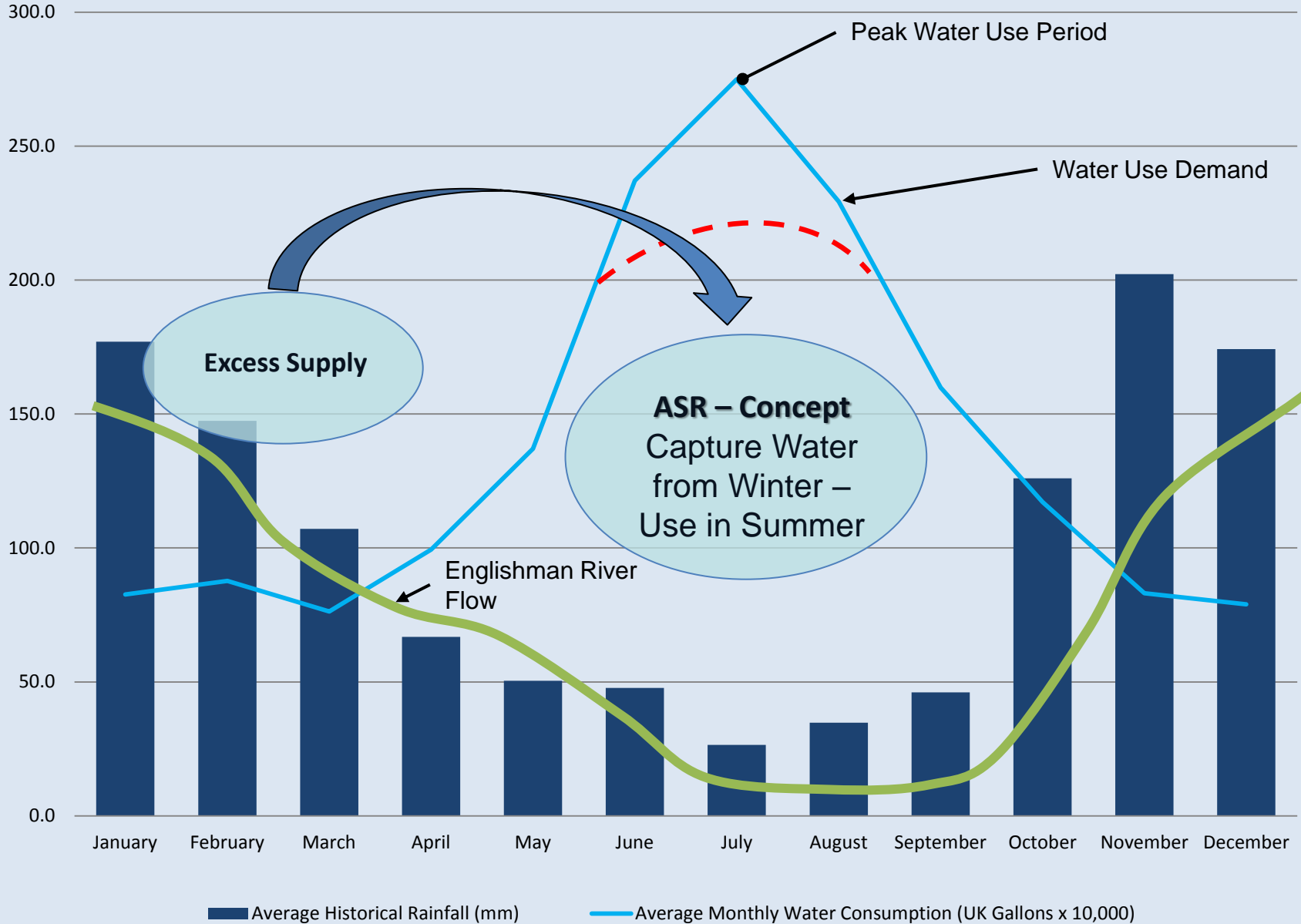
Table 1 Well Operating Status

Well Type	Capable of Operation	Non-Functional	Plugged & Abandoned	Project Sites Containing Wells
ASR	542	14	65	307

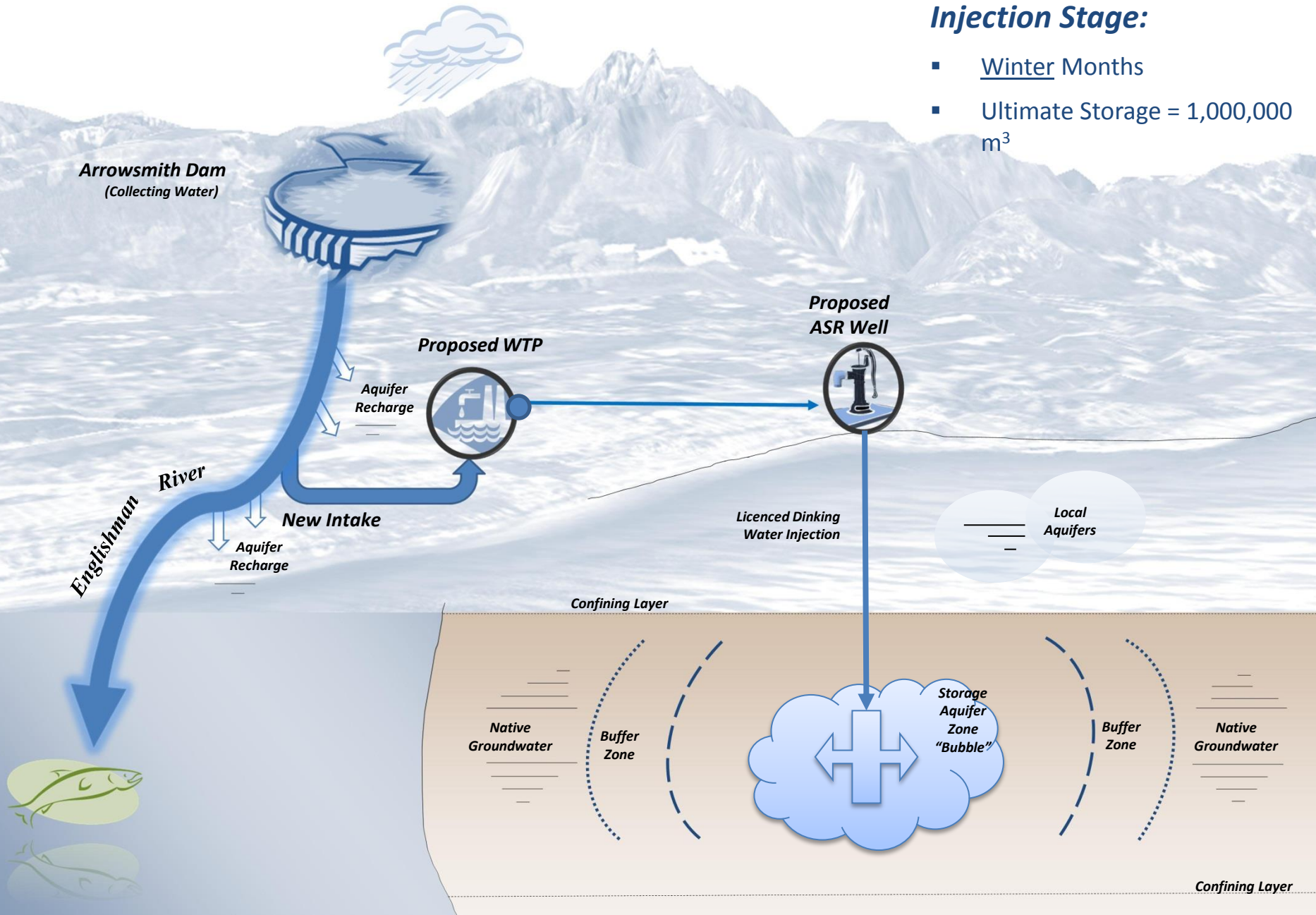


Source: US Environmental Protection Agency

# Illustration of Average Monthly Rainfall vs. Monthly Water Consumption



# Aquifer Storage Recovery (ASR).....our plans

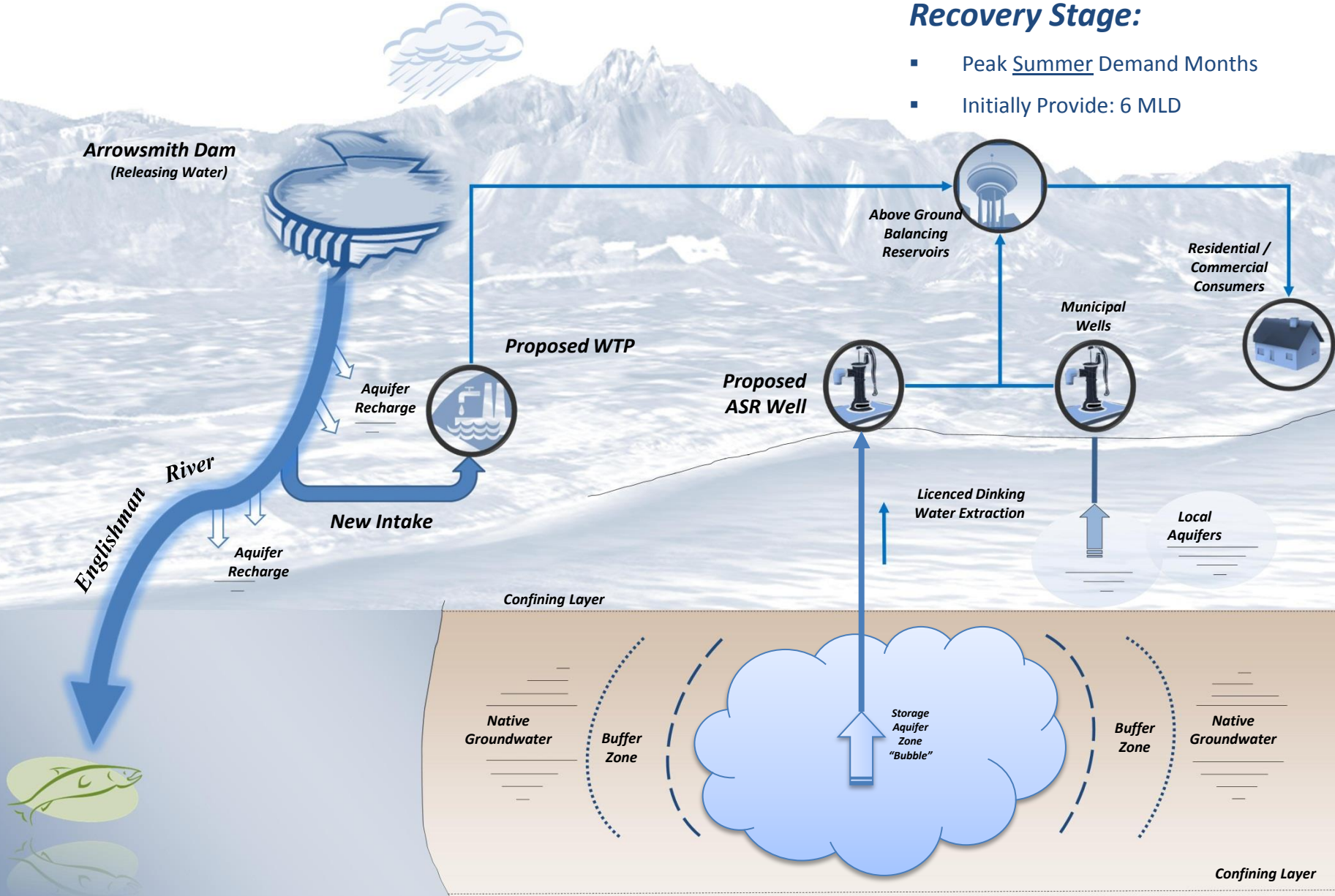


## Injection Stage:

- Winter Months
- Ultimate Storage = 1,000,000 m<sup>3</sup>



# Aquifer Storage Recovery (ASR)...our plans



## Recovery Stage:

- Peak Summer Demand Months
- Initially Provide: 6 MLD

# In Summary

## Benefits

- Delays expansion of the treatment plant
- Reduces demand on the river in the summer
- Utilizes abundance effectively
- Buffer against climate change impacts
- Less expensive than surface storage options
- Balances annual treatment plant operations

## Next Steps

- Engineering review to re-commence in 2019
- Health Authority regulations and approvals required

# Parker Road Well

- Monitoring program
- Pumping Test
- Results under review
- Assessment on 1 year of monitoring begins in April
- Development of an operating rule

[www.nanoosewatermonitoring.ca](http://www.nanoosewatermonitoring.ca)

# Capital Projects Update

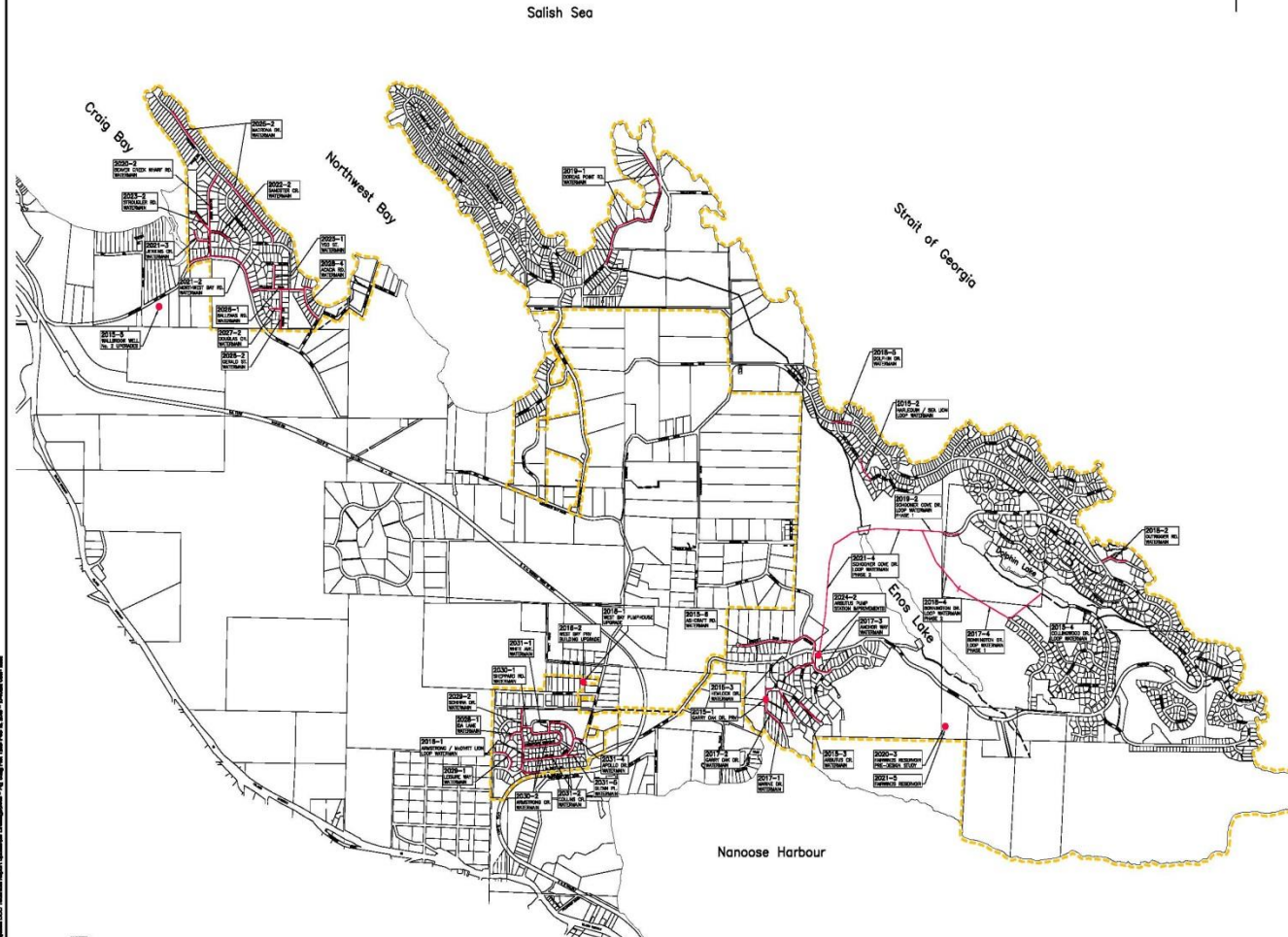
- Successful Referendum in 2014 - \$2.6 Million
- 14 projects over 5 years
- Over 4 km of watermain replacement

# Capital Projects Update

- Improved Fire Flows
- Improved pressures in the Red Gap area
- Replacement of aging infrastructure

**LEGEND**

- SERVICE AREA BOUNDARY ---
- WATERMAIN CONSTRUCTION OR REPLACEMENT ---
- STRUCTURE OR COMPONENT CONSTRUCTION OR MODIFICATION ●
- PROJECT YEAR & NUMBER, AND DESCRIPTION (EY) 2015-1  
2015-2  
2015-3



**NOTES**  
 PROJECTS ASSOCIATED WITH THE REGIONAL DISTRICT OF NANAIMO'S CONTRIBUTION OF THE ENGLISHMAN RIVER WATER SERVICE ARE NOT SHOWN ON THIS SCHEMATIC.

**RECORD OF REVISIONS**

REV	DATE	BY	ENG	DESCRIPTION
1	22OCT14	CACH	KD	ADDED 2015-8 AND 2018-5

B	22OCT14	CACH	KD	100% SUBMISSION
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A	10SEP14	CACH	KD	FINAL DRAFT
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ISS	DATE	BY	ENG	DESCRIPTION
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**RECORD OF ISSUE**

**SEAL**

PROJECT NO. 1443 (old No. 1058)

DRAWN	CACH
DESIGNED	KD
CHECKED	CD
APPROVED	CD
DATE	SEP 2014
SCALE	1:15,000
CLIENT	

**REGIONAL DISTRICT OF NANAIMO**

**PROJECT**  
 NBP WATER SYSTEM  
 DCC TECHNICAL  
 REPORT UPDATE

**TITLE**  
 WATER SYSTEM  
 IMPROVEMENTS  
 SCHEMATIC  
 (TO 2031)

# 2014 Referendum Capital Projects Status

Project Description	Planned for?	Status
Garry Oak Drive Main and PRV (and Spruce Lane)	2015	✓ Complete
Harlequin/Sea Lion Loop & Footbridge	2015	Cancelled
Arbutus Crescent Main	2015	✓ Complete
Hemlock Drive Main	2015	✓ Complete
Ashcraft Road Main	2015	✓ Complete
Armstrong / McDivitt Loop	2016	Design in Progress
West Bay PRV Upgrade	2016	Planned
Marine Drive Watermain Replacement	2017	Planned
Anchor Way Watermain Replacement	2017	Planned
West Bay Pumphouse Upgrade	2018	Planned
Dolphin Drive Main	2018	Planned
Outrigger Road Main	2018	Planned
DCC Major Update Study	2018	Planned
Dorcas Point Rd Main	2019	Planned

# Water Monitoring

- Area E expanded water monitoring -Start in 2016
- Why? *Collect more local data across Area E as a whole to better understand groundwater aquifer / surface water availability and demand in Nanoose.*
- Possibilities:
  - Streamflow monitoring
  - Volunteer well level monitoring to fill data gaps
  - Use data for modelling i.e. pumping scenarios, climate scenarios

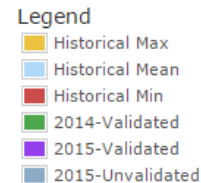
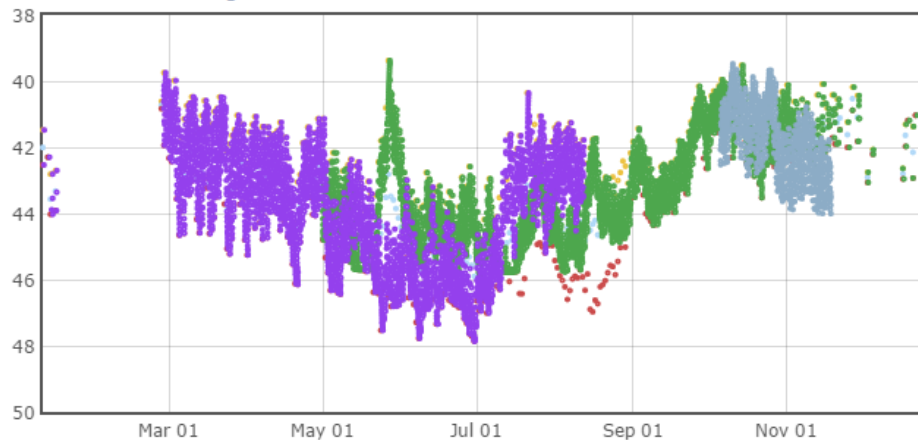


# Groundwater Monitoring

- **Pink** icons = BC Groundwater Observation Wells
- 5 in Area E, collecting water level data



Water level below ground surface in metres

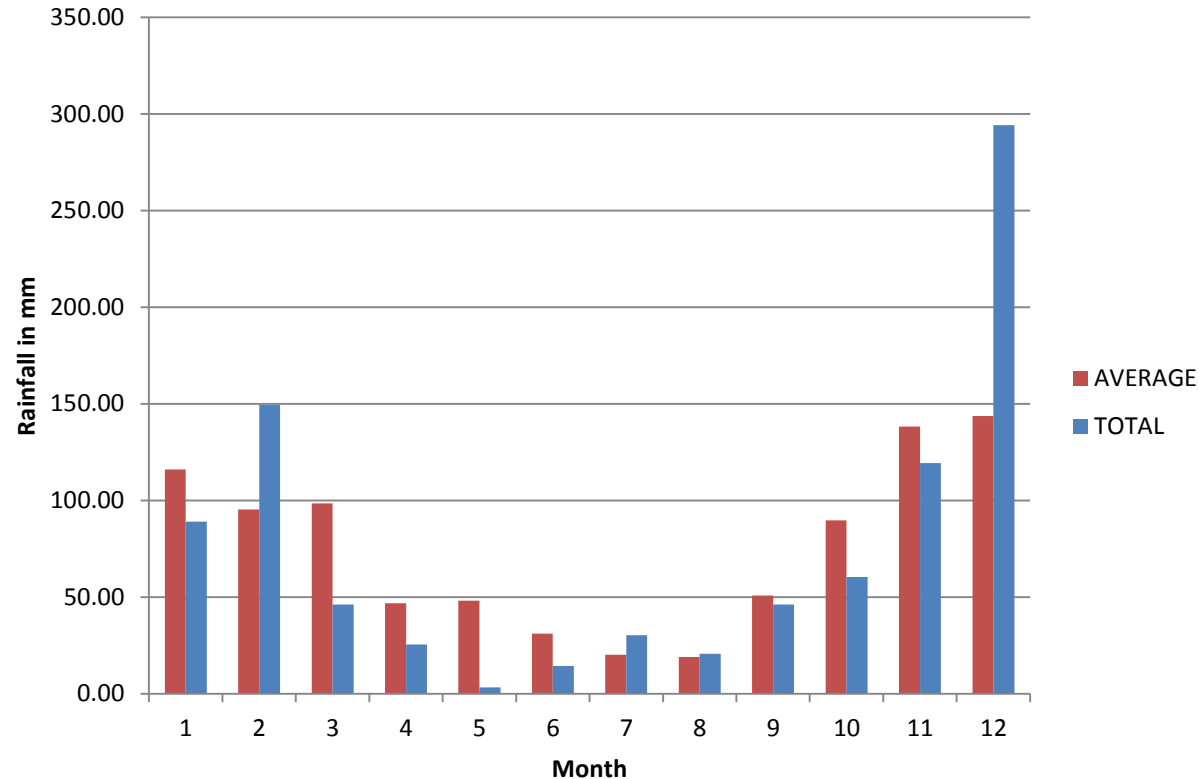


Add or remove data

- Historical Max
- Historical Mean
- Historical Min
- 2014-Validated
- 2015-Validated
- 2015-Invalidated

# Local Rainfall

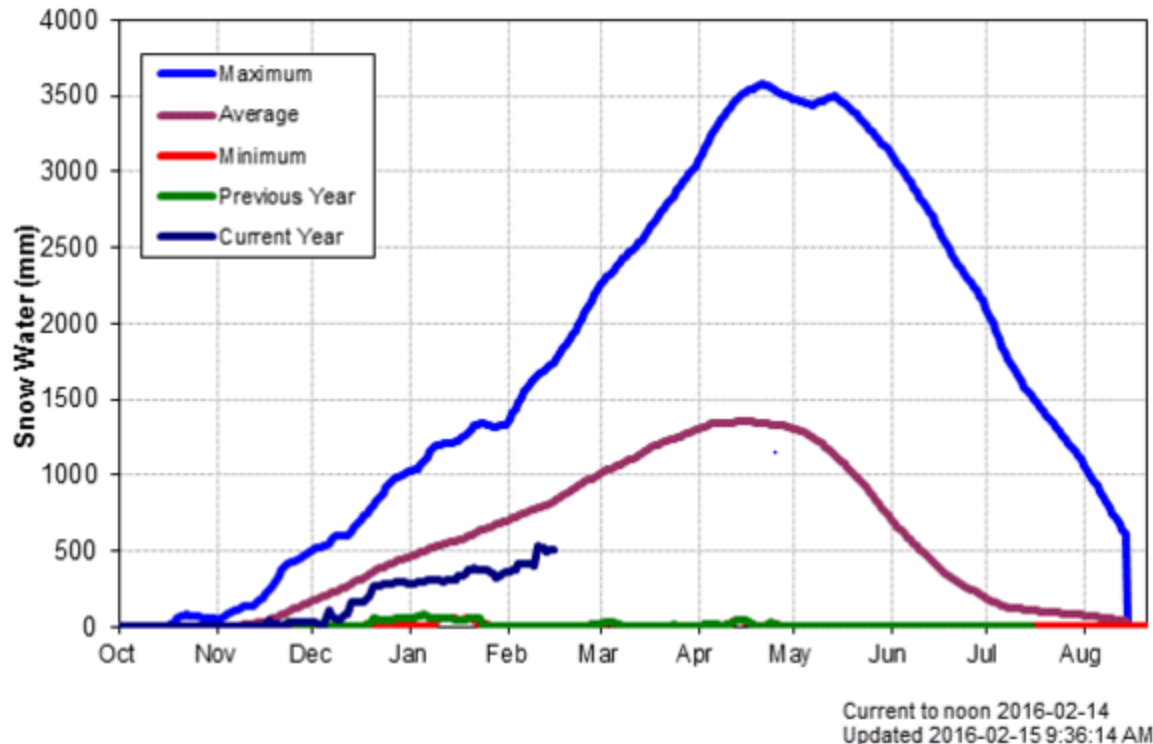
## 2015 Fairwinds Precipitation



- Blue = total mm for 2015
- Red = average mm between 2008-2015

# Snowpack

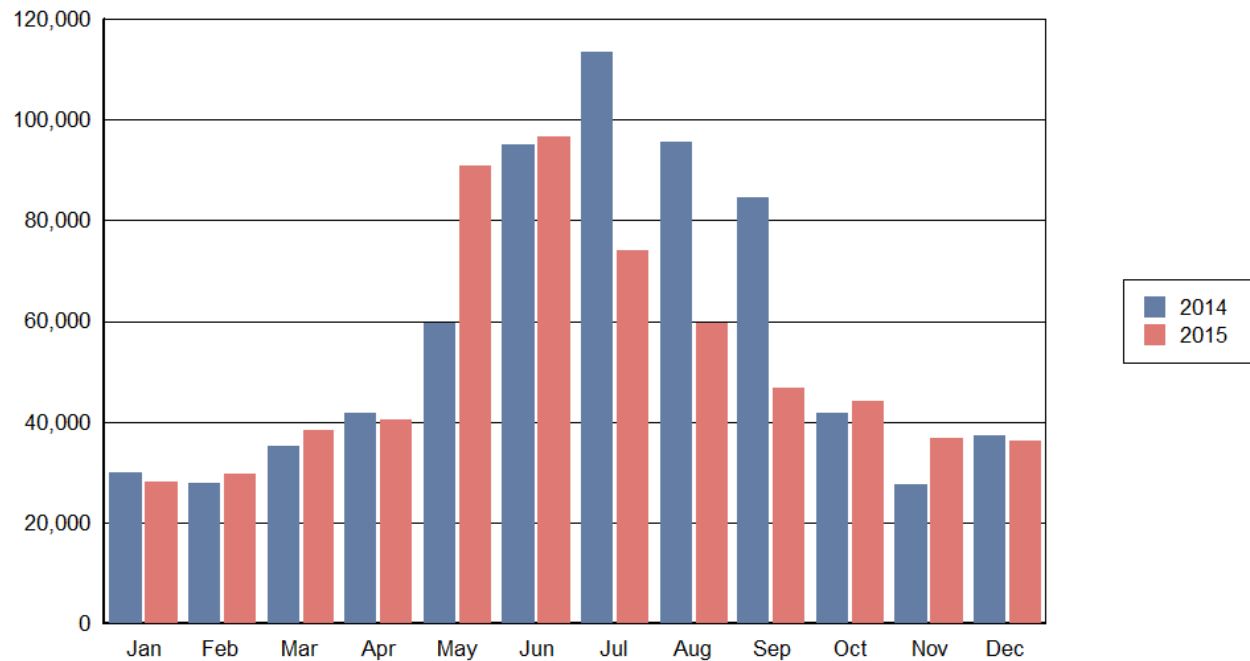
*Vancouver Island at 85% of normal snowpack – Feb. 1 Snow Survey Bulletin*



- This shows Nanaimo River Watershed Snowpillow @ Jump Creek
- **NAVY** = current year **GREEN**= last year (new min.) **BURGUNDY**= avg. circa '95
- Station recently installed @ Mt. Arrowsmith – will have data for 2016-17 snow year

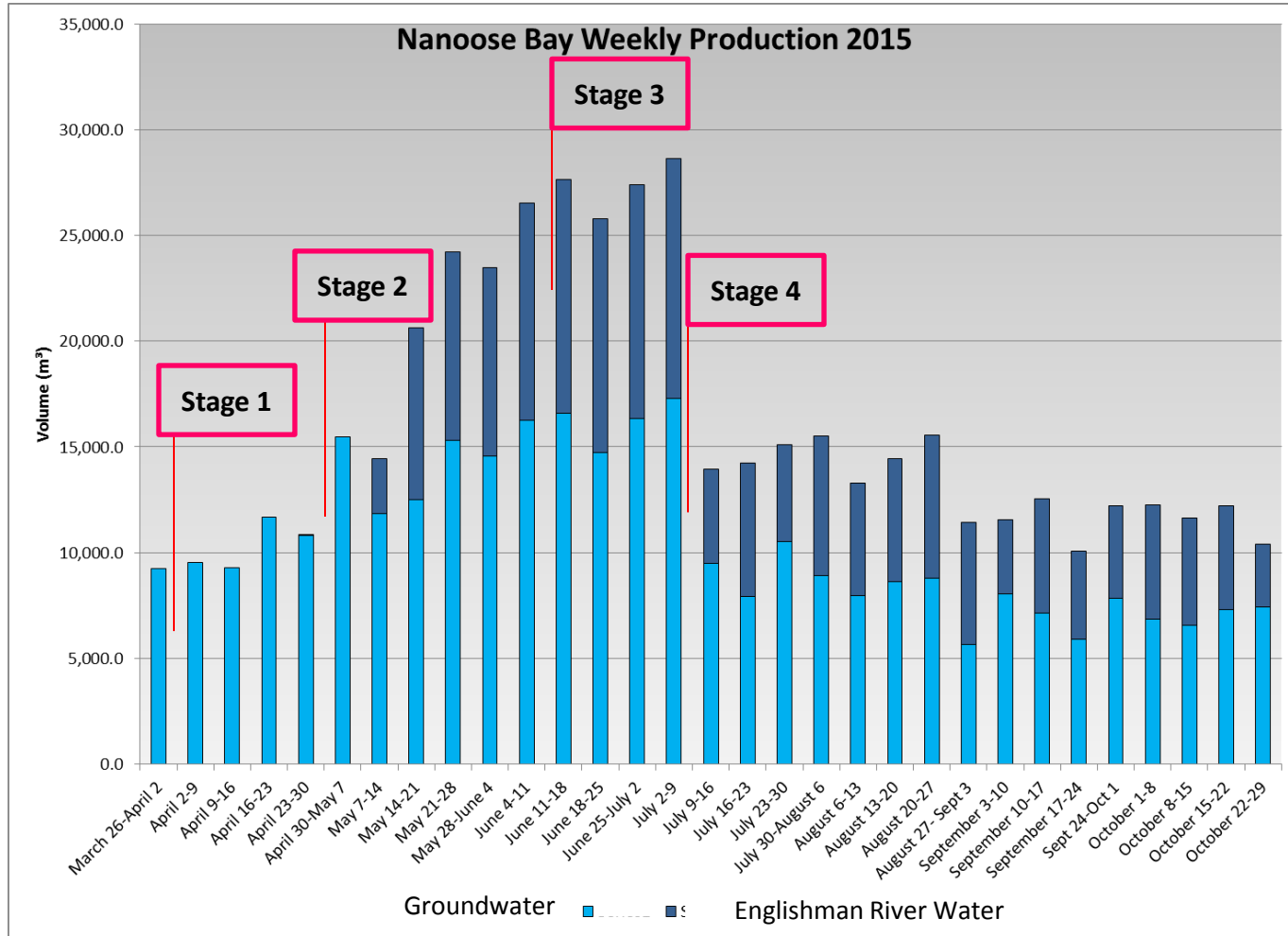
# NBPWSA Water Consumption

## Monthly Total Water Consumption



- Blue = 2014
- Red = 2015

# NBPWSA Water Consumption



# Water Conservation



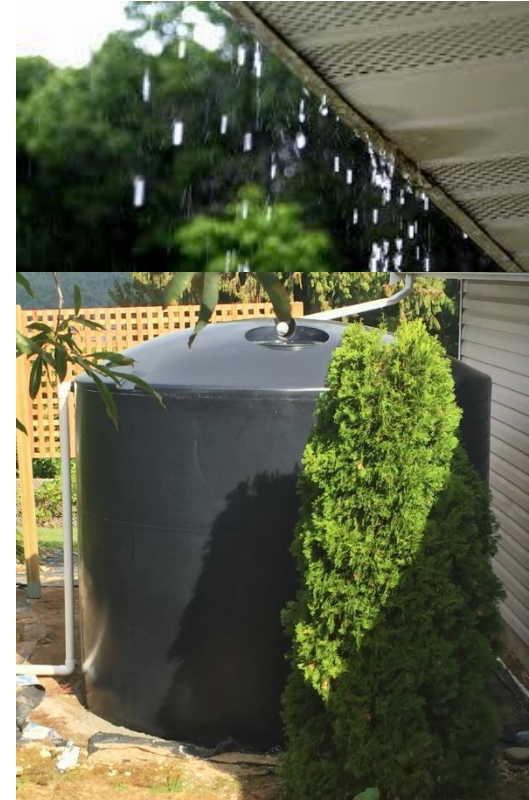
**Water Day**  
CANADA WATERWEEK

**Nanaimo**  
March 20 10am - 5pm  
Bowen Park Complex

**Qualicum Beach**  
April 3 10am - 5pm  
Qualicum Commons

**FREE COMMUNITY EVENTS**  
Interactive Booths • Workshops • Speakers  
Kids Activities • Artists • Food Concession • Live Music

*CELEBRATE WATER!*



- Rebates
- Workshops & Water Day
- Irrigation Check-ups
- TWS Community Booth
- School Programs



# Water Conservation

## New Region-Wide Watering Restrictions Framework

- All major water purveyors have agreed to adopt this – pending Board/Council approvals
- Improved communication – less confusion, more clarity
- Gives customers autonomy to decide where to cut back, as long as reductions are made

STAGE	1	2	3	4
Sprinkling Times	Between 7 PM – 7 AM	7-10 AM OR 7-10 PM for a max. of two hours	<b>VOLUNTARY HEIGHTENED WATER USE REDUCTIONS</b>	<b>Sprinkling Ban: Lawn Watering Not Permitted</b>
Frequency	Any day	Every Other Day Even # houses – Even days Odd # houses – Odd days		
Pop-up spray, Rotors & Sprinklers	Only during permitted times	Only during permitted times		
Hand-watering & Drip Irrigation (trees, shrubs, flowers)	Anytime	Anytime		Only between 7-10 AM or PM
Vegetable Gardens	Anytime	Anytime		Anytime

# Feedback Period

- Whole group comments & feedback on what was presented
- Breakout table small group discussion:
  1. What can the RDN do to promote water conservation?
  2. What do you/we need to know about water in Nanoose?
  3. Other comments, ideas, suggestions?



# FEEDBACK QUESTIONS

1. *What can the RDN do to promote water conservation?*
2. *What do you/we need to know about water in Area E?*
3. *Other comments, ideas, suggestions?*

# BREAKOUT GROUP ETIQUETTE 😊

- *Listen to understand*
- *Create a hospitable space*
- *Encourage each person's contribution*
- *Connect diverse people and ideas*
- *Share verbally and on paper*
- *Doodle, draw - have fun!*



# Summary

- Tables present key points from discussion.
- Meeting concludes 9:00PM.
- Opportunity for people to view display posters and ask staff further questions / provide staff with further comments.

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# Thank You For Coming!

Next meeting TBA – June 2016

Area E Water Monitoring & Water Sustainability