

Water System Master Plan Open House

Wednesday, February 21, 2018

6:00 PM – 8:00 PM

White Rock Community Centre

(15154 Russell Ave, White Rock)

WHITE ROCK WATER SYSTEM PATH



7 WELLS

Increased water capacity by over 30%



SECONDARY TREATMENT

MERKLIN, OXFORD, & ROPER RESERVOIRS



80 KM

ALL PIPE NETWORK IN THE GROUND



FIRE HYDRANTS, HOMES, SCHOOLS, HOSPITAL

Water Quality Milestones Reached

The water system in White Rock had been owned and operated by private owners until it was acquired by the City of White Rock in October of 2015. The source of the City's water has not changed and remains the same.

Since taking over the operations, the City has taken many steps to improve the water quality. Please see the infographic below for a snapshot of water-related milestones the City has accomplished to date.



ABOUT THE PROJECT

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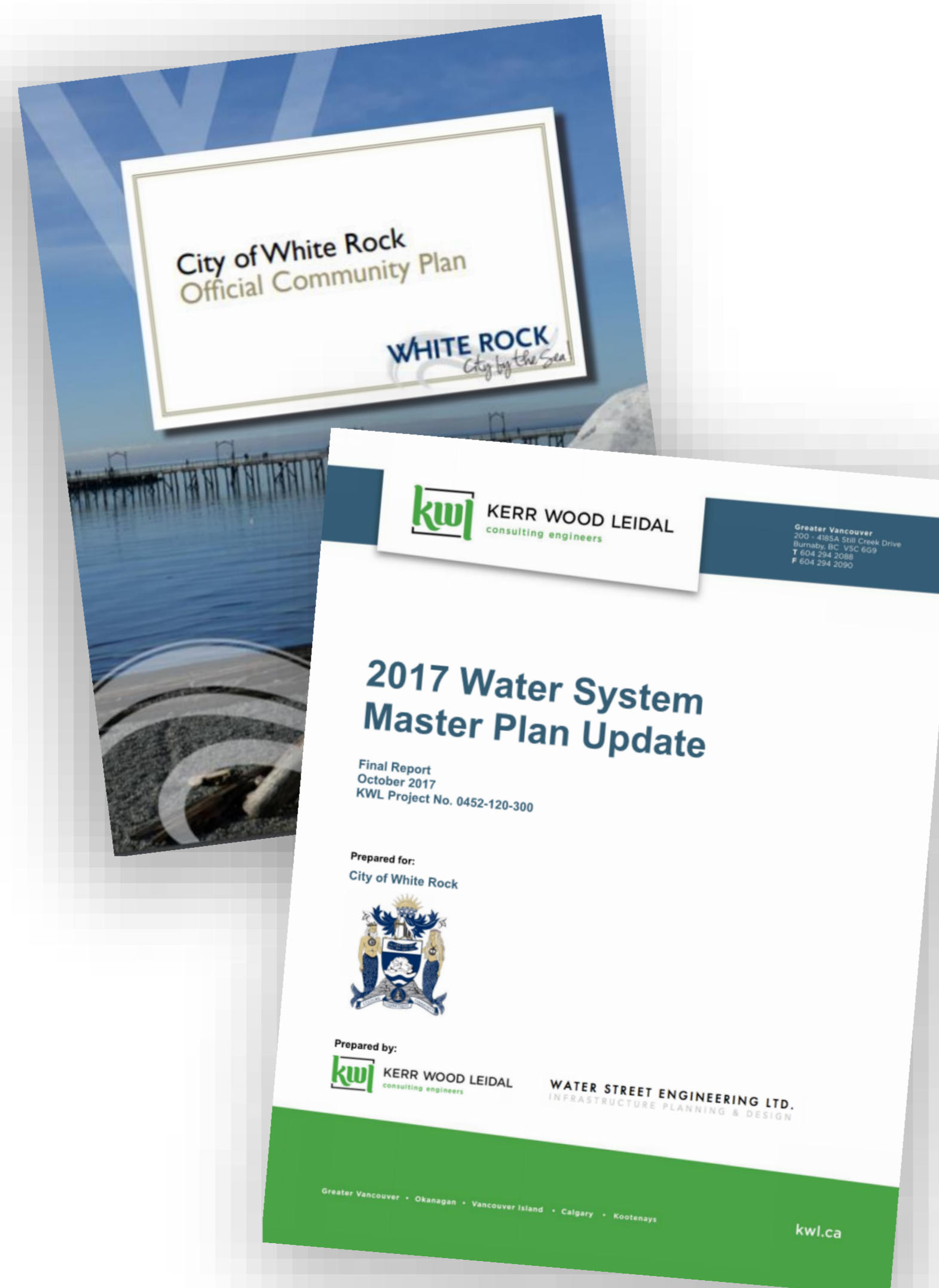
In 2017, the City of White Rock initiated a project to review and update the Water System Master Plan (WSMP), which provides an all-encompassing, comprehensive guide to efficiently address all of the water system needs to the year 2045.

The last Master Plan was completed in 2013. Since this time, there have been significant changes to the White Rock water system, community growth, and a new Official Community Plan (OCP). A fresh look at the water system was needed!

The WSMP Update Project is an important part of the strategic process for assessing the current state of the White Rock Water System, the ability to meet future needs, and identifying priority actions to improve water management and quality.

PROJECT OBJECTIVES

1. **Understand current demands** on the water system, and how demand might increase in the future
2. **Evaluate the efficiency and deficiencies** of our water system
3. **Recommend improvements** needed over the next 20 years.



PROJECT PROCESS



OUR WATER SYSTEM

WATER SYSTEM HISTORY

The water system in White Rock had been owned and operated by private owners until it was acquired by the City of White Rock in October of 2015. The source of the City's water has not changed and remains the same.

Since acquiring the water utility, in 2015, the City has improved water management by:

- Completing the construction of the **Oxford Reservoir and Pumping Station** to increase water storage capacity
- Replacing the seismically deficient High Tower Reservoir by the **new Merklin Reservoir** and constructing the **Merklin Pumping Station**
- Phasing in a **secondary disinfection system** for the entire Utility, as mandated by Fraser Health
- **Training City water operators** on additional water disinfection processes
- **Intensive sampling and analysis** for metals in the distribution system
- Presentations on water treatment advancements at national and international conferences
- **Adding remote monitoring and control features** to the water system
- Receiving nearly **\$12 million in grant funding for water treatment** to address naturally occurring arsenic and manganese



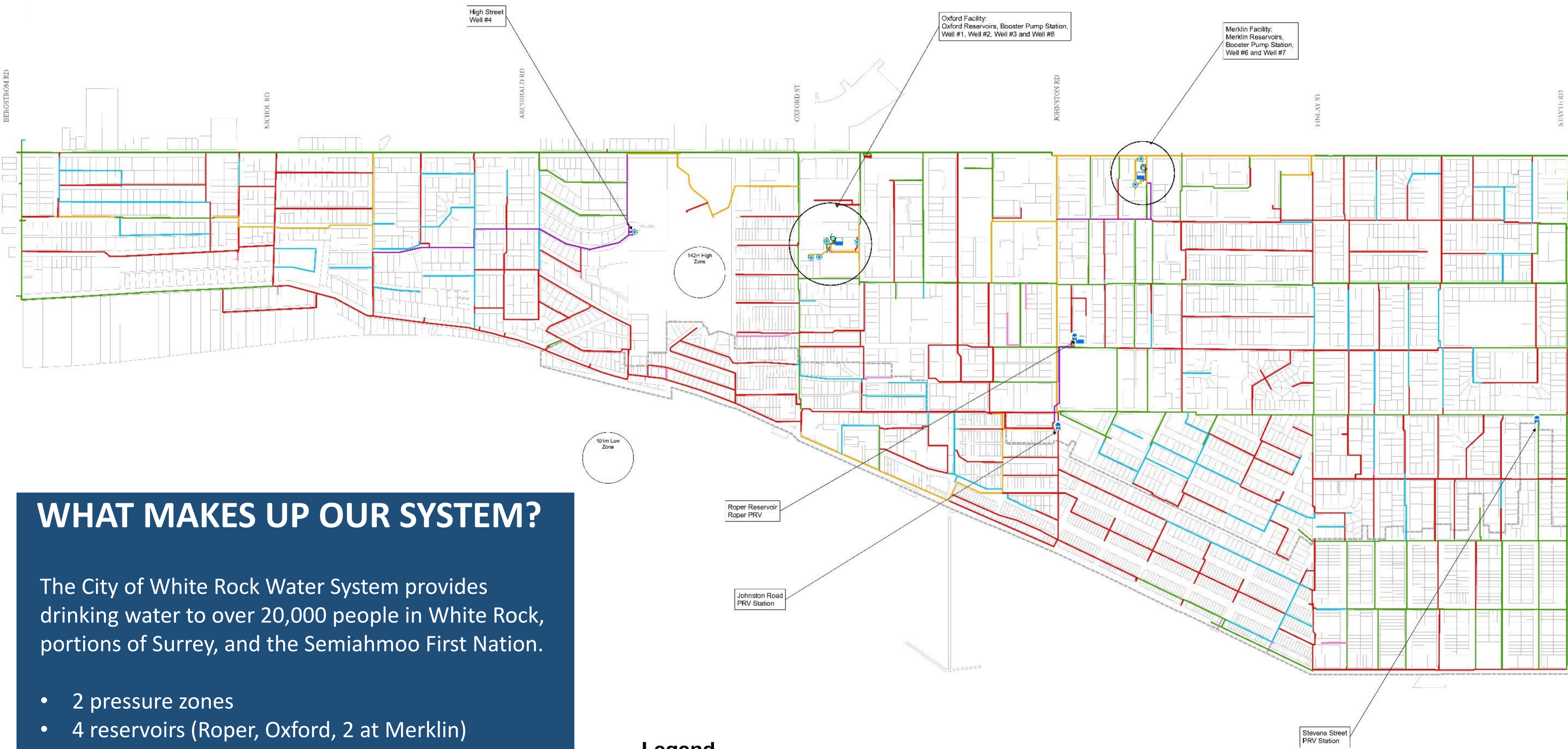
“The City is committed to managing and delivering community water in a way that is safe, sustainable, affordable, transparent, and grounded in scientific best practices.”

WHAT'S NEXT?

Next steps for improving water management include:

- Providing the required **training to water operators** for the operation of the new water treatment plant
- **Hiring additional operators** to deliver a successful and sustainable city-wide water operation
- **Optimizing the operation of the water treatment process** to meet the City's economic and sustainability targets

OUR WATER SYSTEM COMPONENTS



WHAT MAKES UP OUR SYSTEM?

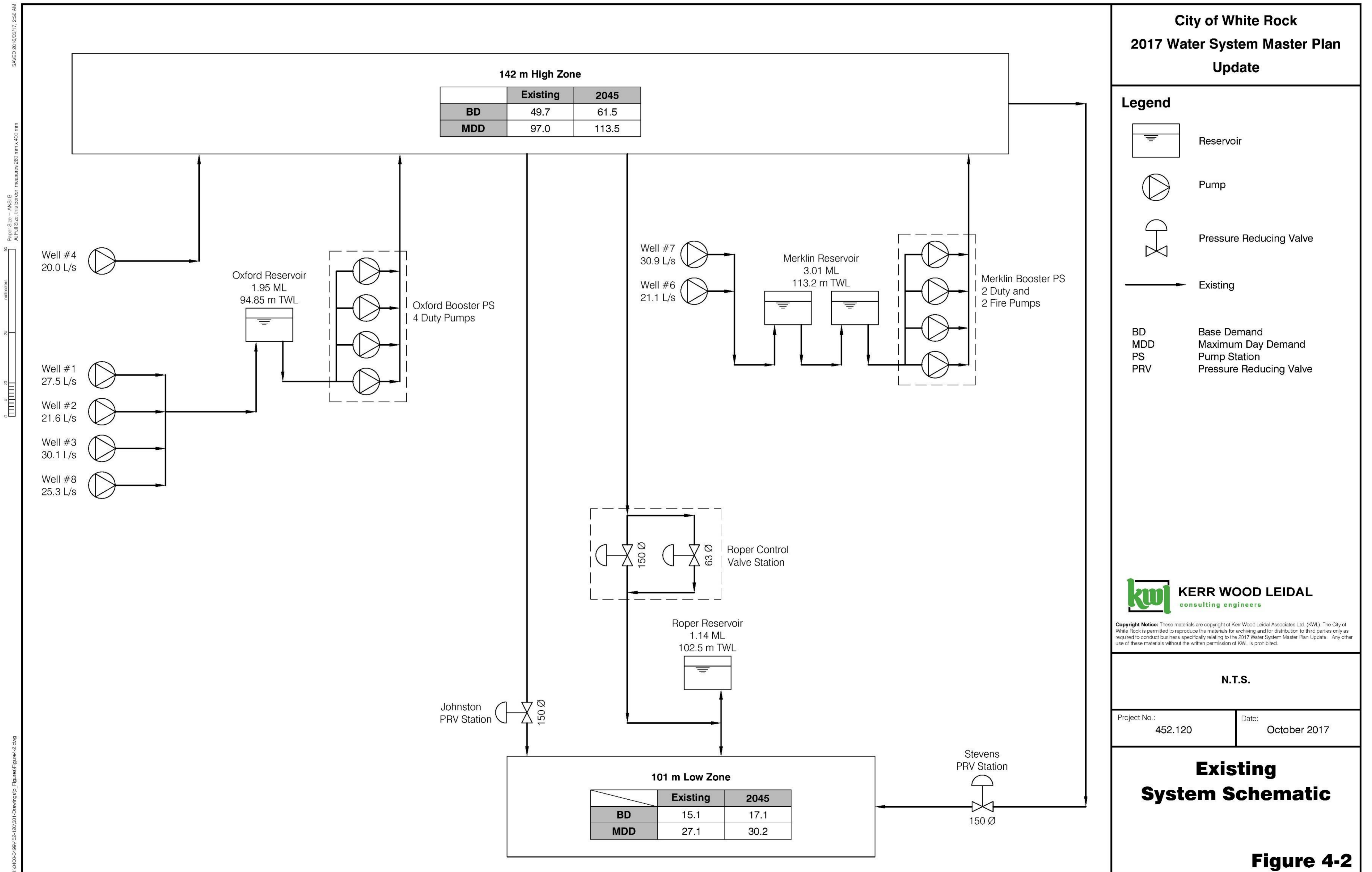
The City of White Rock Water System provides drinking water to over 20,000 people in White Rock, portions of Surrey, and the Semiahmoo First Nation.

- 2 pressure zones
- 4 reservoirs (Roper, Oxford, 2 at Merklin)
- 7 groundwater wells
- 78km of water mains
- New Merklin and Oxford Booster Pump Stations
- 3 pressure reducing valve stations (Roper Ave, Stevens St, Johnston Rd)

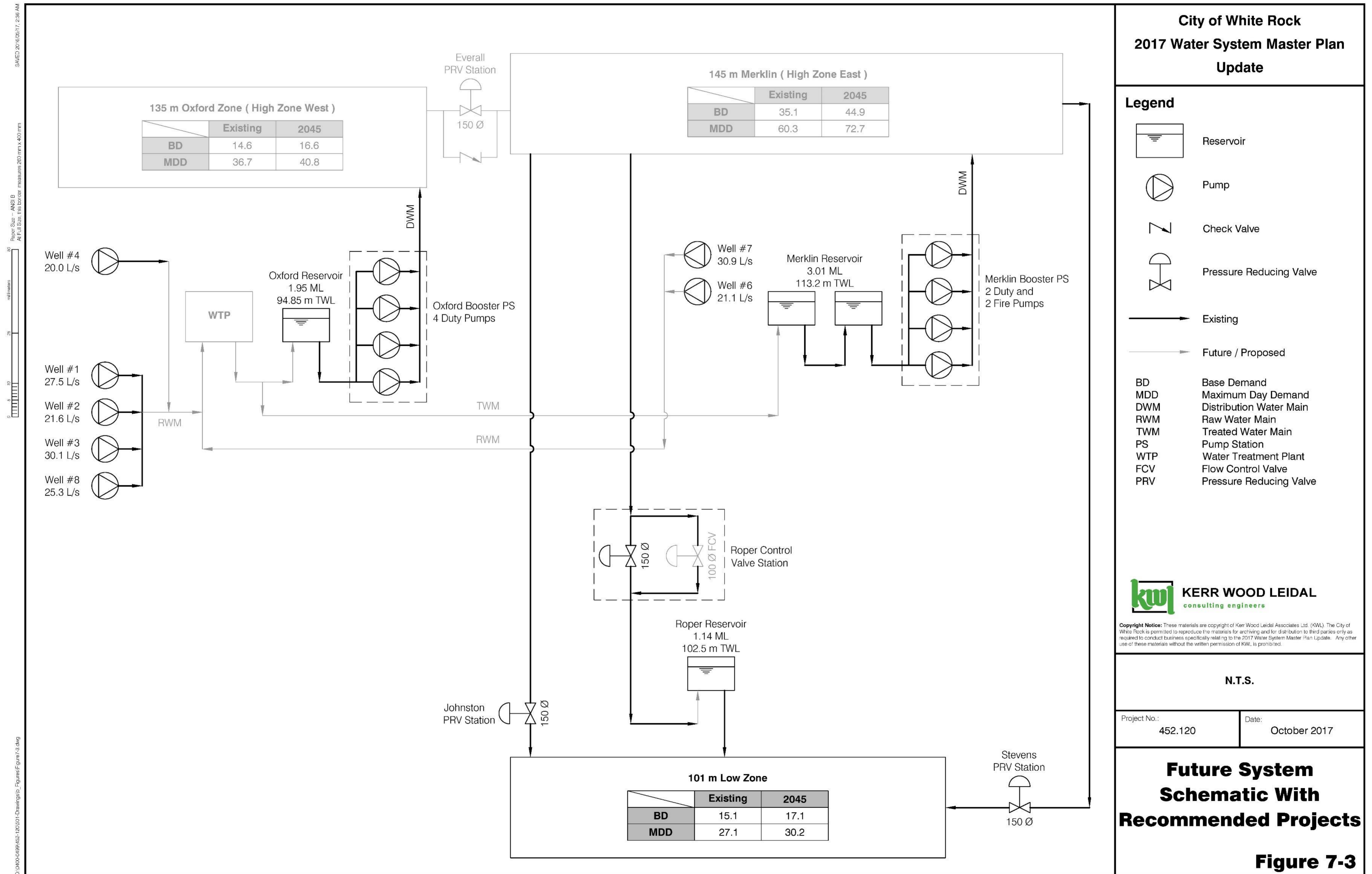
Legend

	Groundwater Well	Diameter (mm)		250	
	Pressure Reducing Valve		< 100		300
	Pump Station		100		350
	Reservoir		150		400
	Pressure Zone Boundary		200		

EXISTING WATER SYSTEM SCHEMATIC



FUTURE WATER SYSTEM SCHEMATIC



WATER SYSTEM CAPACITY



Booster Pumps at Merklin Reservoir & Pump Station

SUPPLY CAPACITY OF GROUNDWATER WELLS

The supply capacity for a water system should exceed the maximum daily demand for the system to avoid water shortages during peak summer demands.

- In White Rock's system, the largest capacity well is Well 7 (31 L/s).
- The existing design demand is 124 L/s and is within the rated supply capacity with the largest well out of service (145.5 L/s).
- In the year 2045 water system demands are expected to increase marginally to 144 L/s.
- Well 3 is reaching the end of its service life. A new well (Well 9) is required to replace Well 3.

WATER STORAGE CAPACITY OVERVIEW

The storage requirements for forecasted demands are as shown in the following table.

Balancing Storage Required vs. Available

Required Balancing Storage:	12.4 MLD (144 L/s) x 16%	= 1.99 ML
Required Fire Storage:	212 L/s for 2.6 hours	= 1.98 ML
Required Emergency Storage:	25% of above storage	= 0.99 ML
Total Required		= 4.96 ML
Available Storage:	Merklin Reservoirs	= 3.01 ML
	Oxford Reservoir	= 1.95 ML
	Roper Reservoir (Low Zone)	= 1.14 ML
Total Available		= 6.10 ML
Excess Available for Pump Cycling		= 1.14 ML

Well Number	Location	Capacity ⁽¹⁾ (L/s)
Well 1	Oxford Site	27.5
Well 2	Oxford Site	21.6
Well 3	Oxford Site	30.1
Well 4	High St.	20.0
Well 5	Buena Vista Ave. – out of service, to be decommissioned	-
Well 6	Merklin Site	21.1
Well 7	Merklin Site	30.9
Well 8	Oxford Site	25.3
Total (all wells)		176.5
Rated Capacity with Largest Well Out of Service (L/s)		145.5
Rated Capacity with Well 3 Decommissioned		115.4
Well 9 (New, Well 3 Replacement) – required capacity		29
Rated Capacity with New Well 9		144
<i>Note 1: From 2016 Well Statistics.xlsx provided by the City on August 2, 2017.</i>		

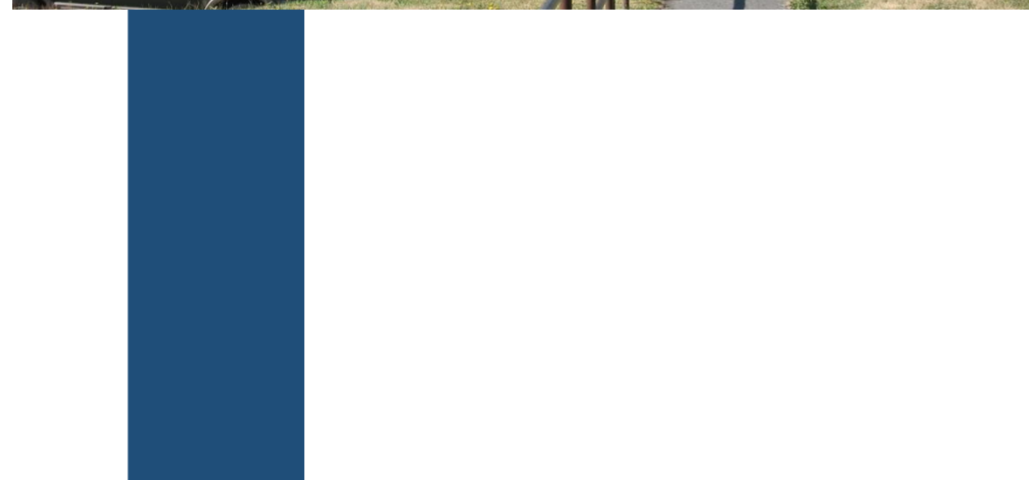
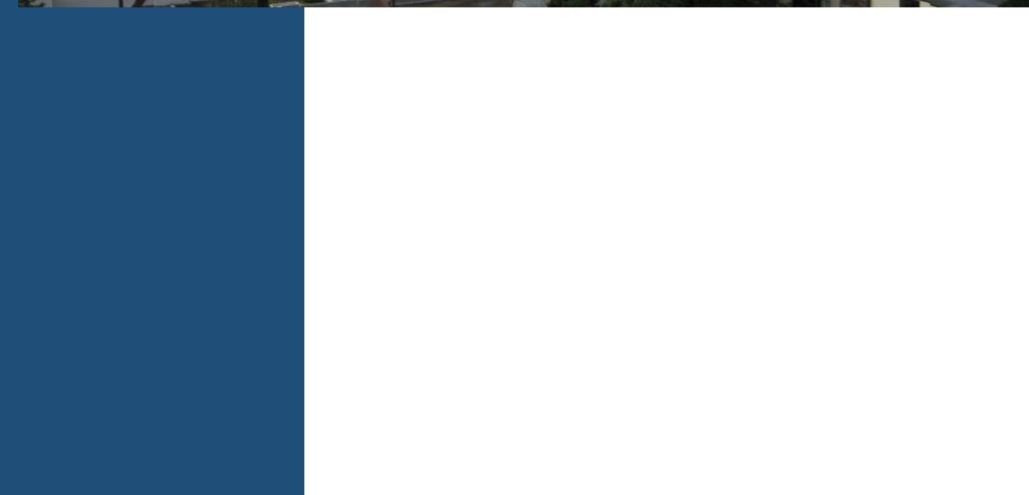
PRIORITIES IN OUR COMMUNITY

WHY IS WATER TREATMENT IMPORTANT?

Our community relies on clean water to keep our **drinking water safe** and **protect the health of community members and visitors**.

Our drinking water is safe to drink. The naturally occurring arsenic levels in our water are at times close to the Maximum Acceptable Concentration (MAC), and the naturally occurring manganese levels are above the Aesthetic Objective (AO) set by the Guidelines for Canadian Drinking Water Quality and must be addressed as required by the “Permit to Operate” by Fraser Health.

The City is on track to achieving these objectives.



Using an Innovative Approach

The City has taken an innovative approach to addressing water quality concerns. We partnered with RES’EAU-WaterNET to conduct research to investigate and select the best technologies for removing the naturally occurring arsenic and manganese from our water system.

RES’EAU-WaterNET has a network of 18 world-class scientists from eight universities across Canada. We reported the findings in 2017 and had an Open House on January 25, 2018, where we also presented the full study.

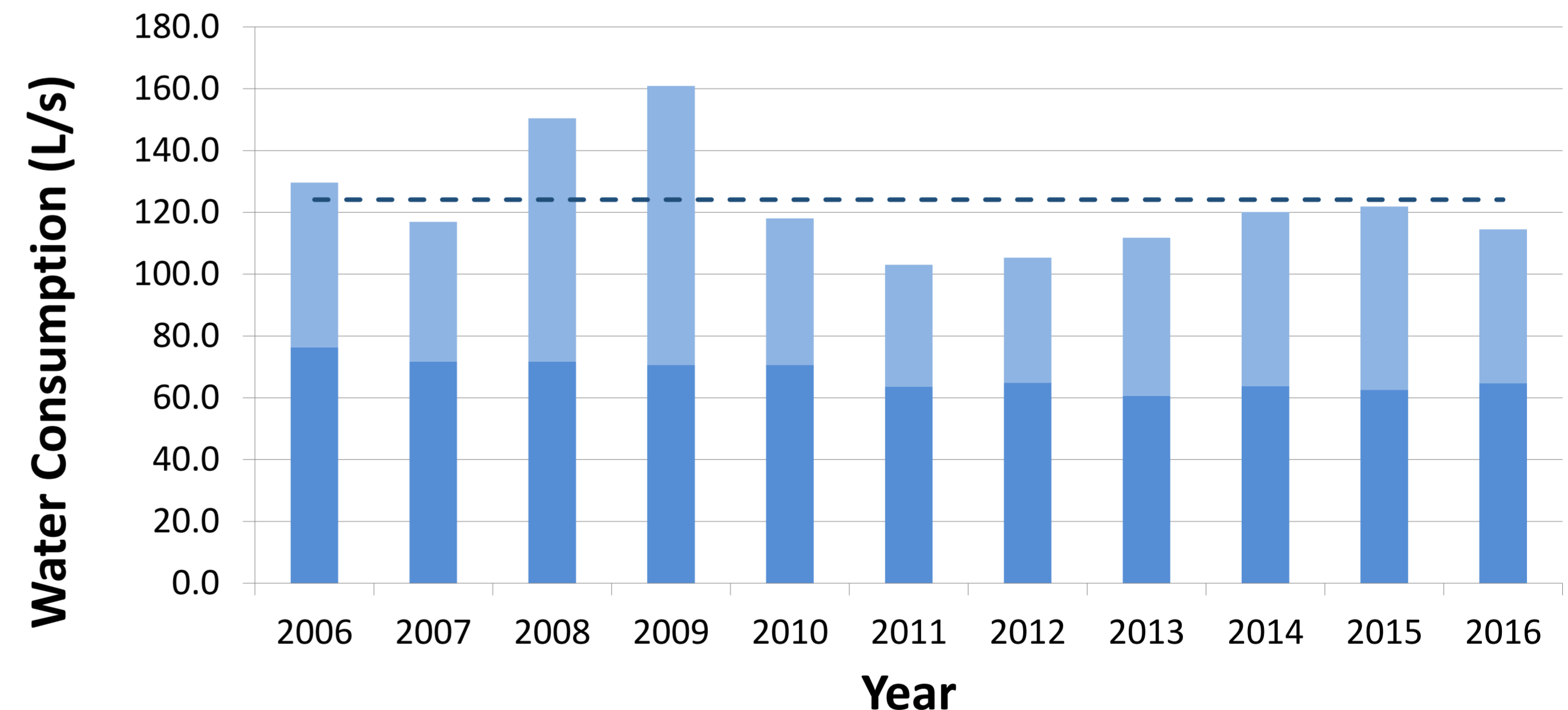
To read RES’EAU’s report, please go to www.whiterockcity.ca/MyWater

WATER CONSERVATION IN OUR COMMUNITY

- Our total water demand has decreased over the past 10 years due to conservation measures, including low-flow fixtures and toilets.
- The City has adopted Metro Vancouver’s new summer watering restrictions, which took effect on May 15th, 2017.

Learn more at www.whiterockcity.ca/MyWater >> Conservation and Restrictions

Maximum Day Demand (2006 – 2016)



■ Additional Seasonal Demand on Max Day ■ Base Demand
 - - Design Existing MDD (124.1 L/s)

Base Demand: Amount of water consumed on an average winter day

Seasonal Demand: Irrigation and other seasonal uses on the peak summer day

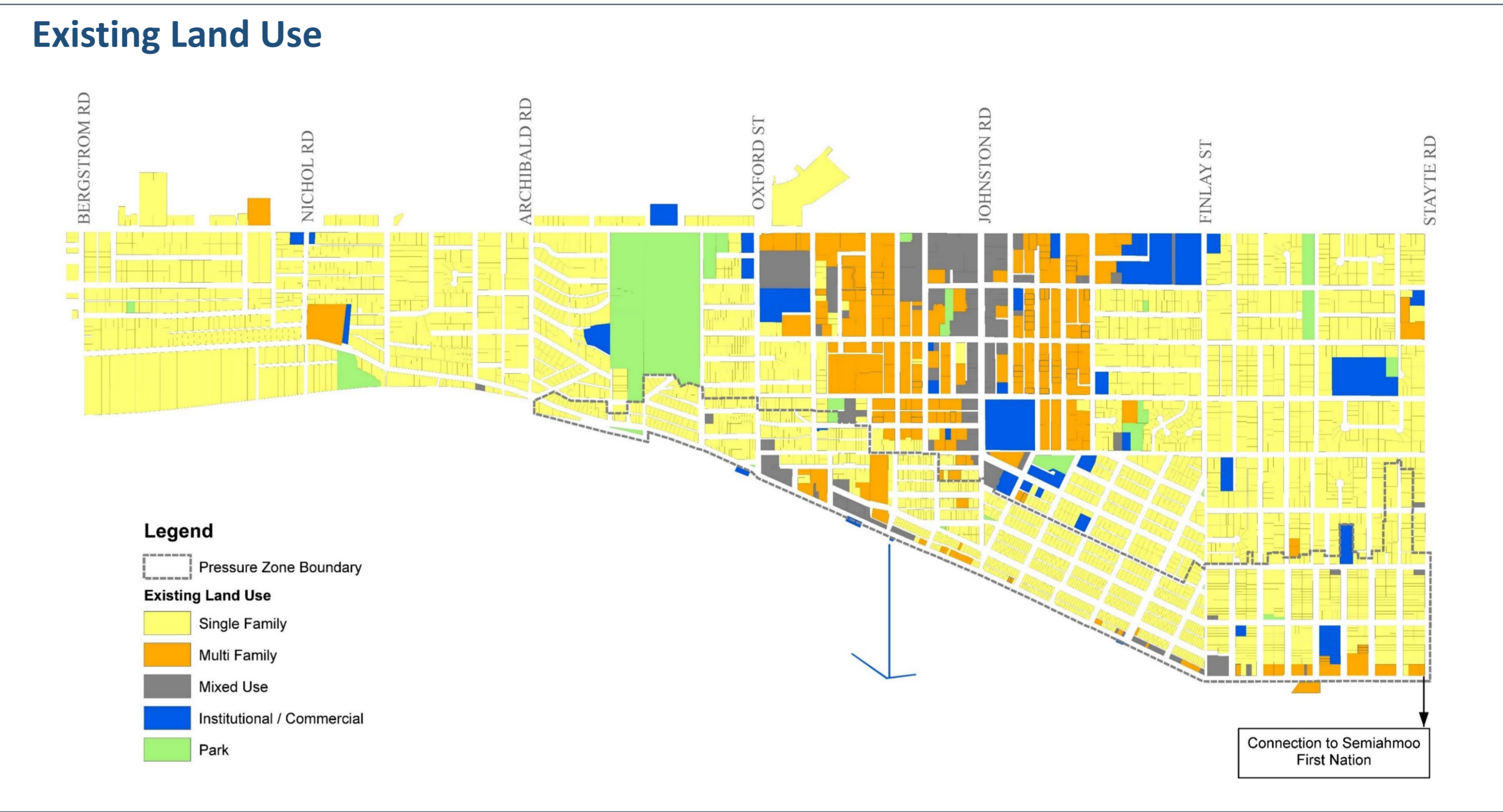
Maximum Day Demand (MDD): Total demand on “peak” day (includes base and seasonal demand)



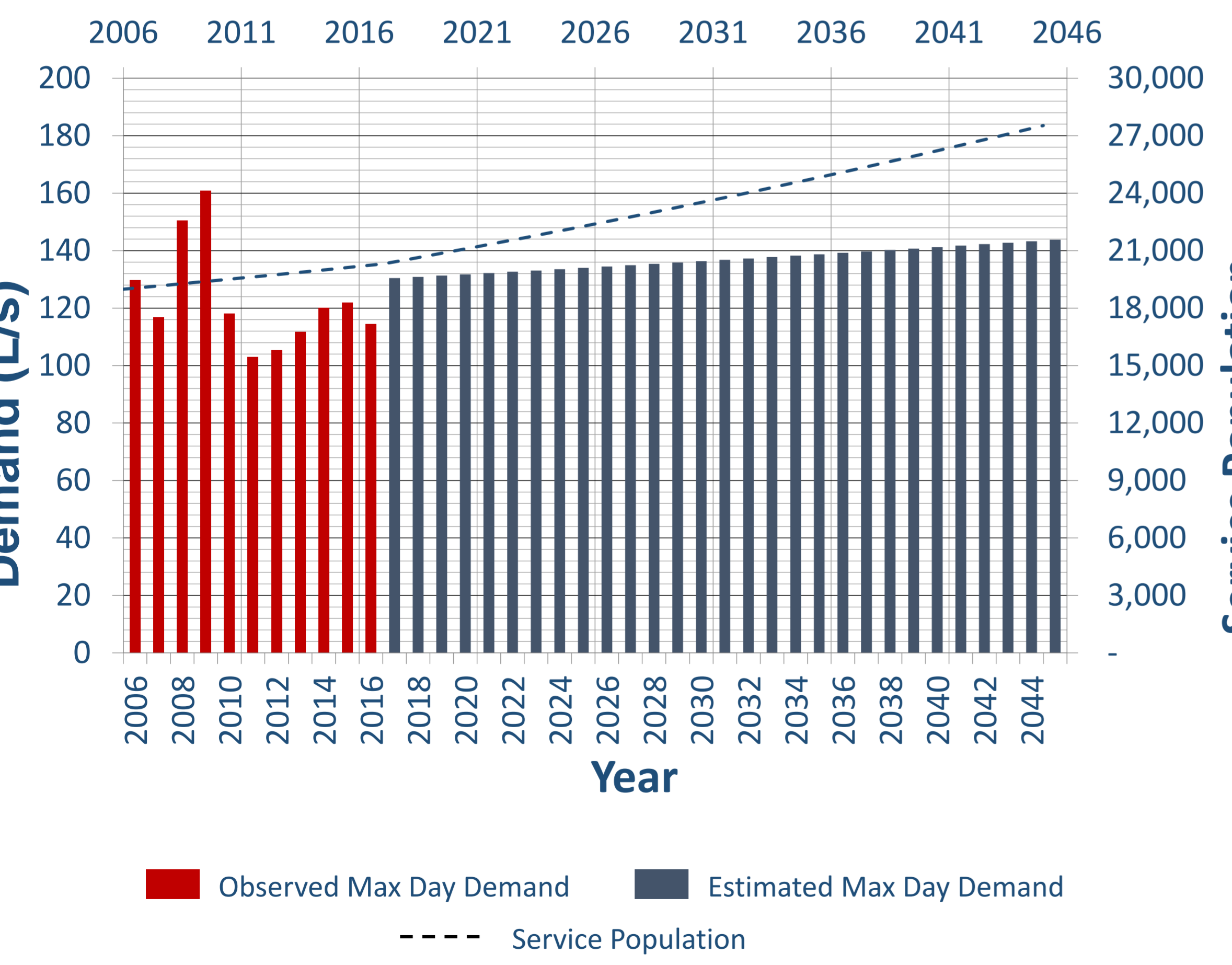
COMMUNITY GROWTH

OUR COMMUNITY IS GROWING

- **Population** expected to grow by as much as 7,300 people in the next 30 years (27,300 people by year 2045)
- **Increasing densification.** Retail and commercial sector is expected to grow by as much as 320,000 ft² of new floor area
- **Water demand is expected to increase slightly** but not significantly, due to **conservation measures and densification**



Projected Population and Estimated Water Demand



MODEL RESULTS - PRESSURE

City of White Rock
2017 Water System Master Plan
Update

Legend

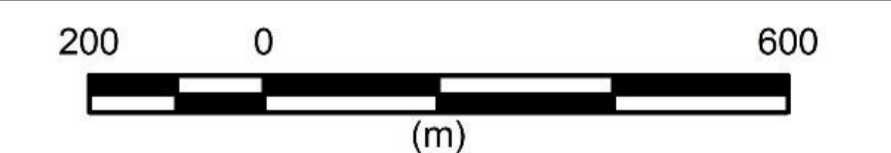
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Reservoir
- Pressure Zone Boundary
- Water Main

Peak Hour Pressure (psi)

- < 43.5
- 43.6 - 50.0
- 50.1 - 60.0
- 60.1 - 80.0
- 80.1 - 150.0
- > 150.0

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consulting engineers
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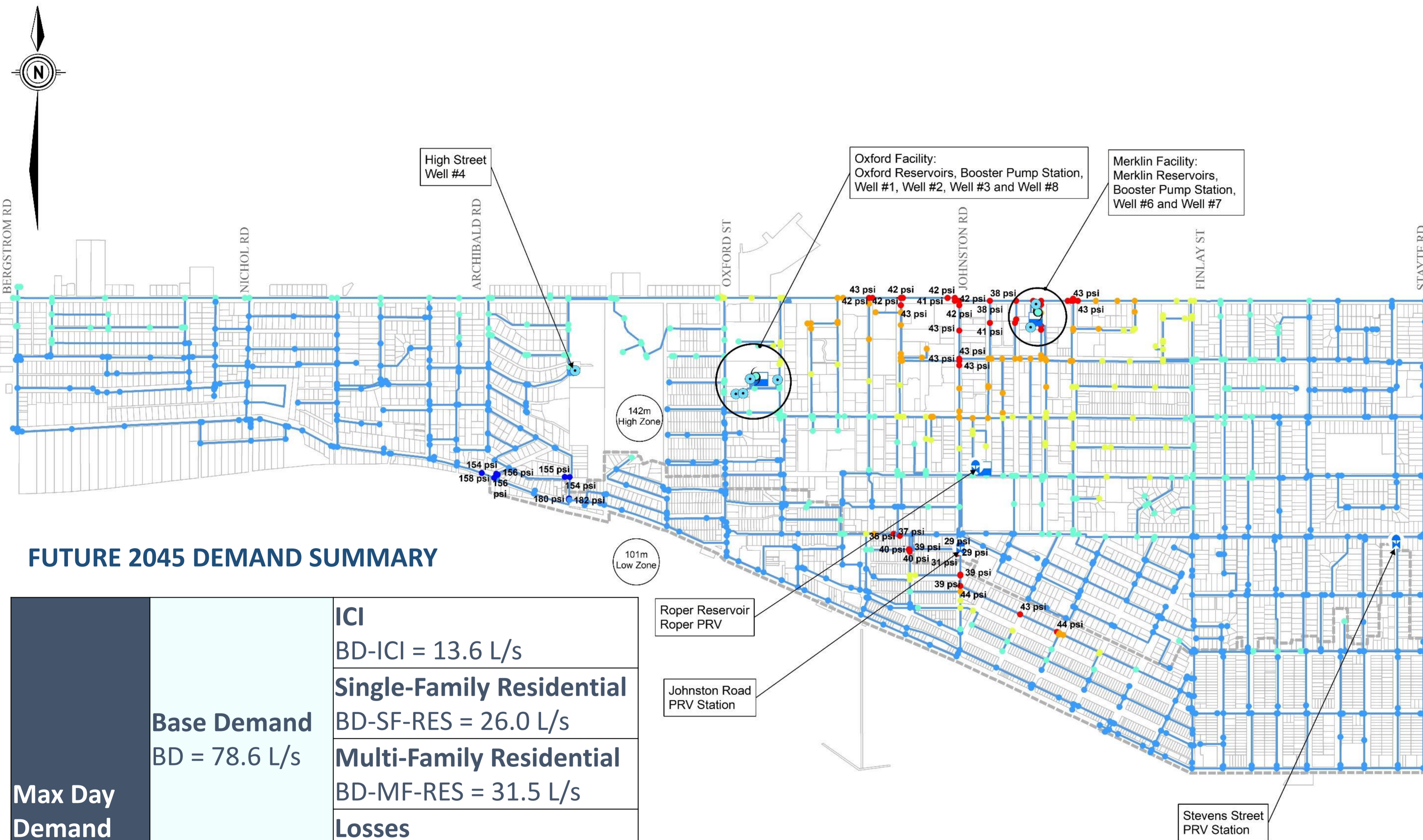
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Project No. 452-120 Date January 2018

**Existing (2018) System
with Future Demands
Peak Hour Pressure**

Figure 6-1



FUTURE 2045 DEMAND SUMMARY

Max Day Demand MDD = 143.8 L/s	Base Demand BD = 78.6 L/s	ICI BD-ICI = 13.6 L/s
		Single-Family Residential BD-SF-RES = 26.0 L/s
		Multi-Family Residential BD-MF-RES = 31.5 L/s
		Losses LOSS = 7.5 L/s
Seasonal Demand SD = 65.2 L/s	ICI SD-ICI = 8.0 L/s	
	Single-Family Residential SD-SF-RES = 51.8 L/s	
	Multi-Family Residential SD-MF-RES = 5.4 L/s	

Roper Reservoir
Roper PRV

Johnston Road
PRV Station

Stevens Street
PRV Station

**System improvements have been
recommended to improve pressure.**

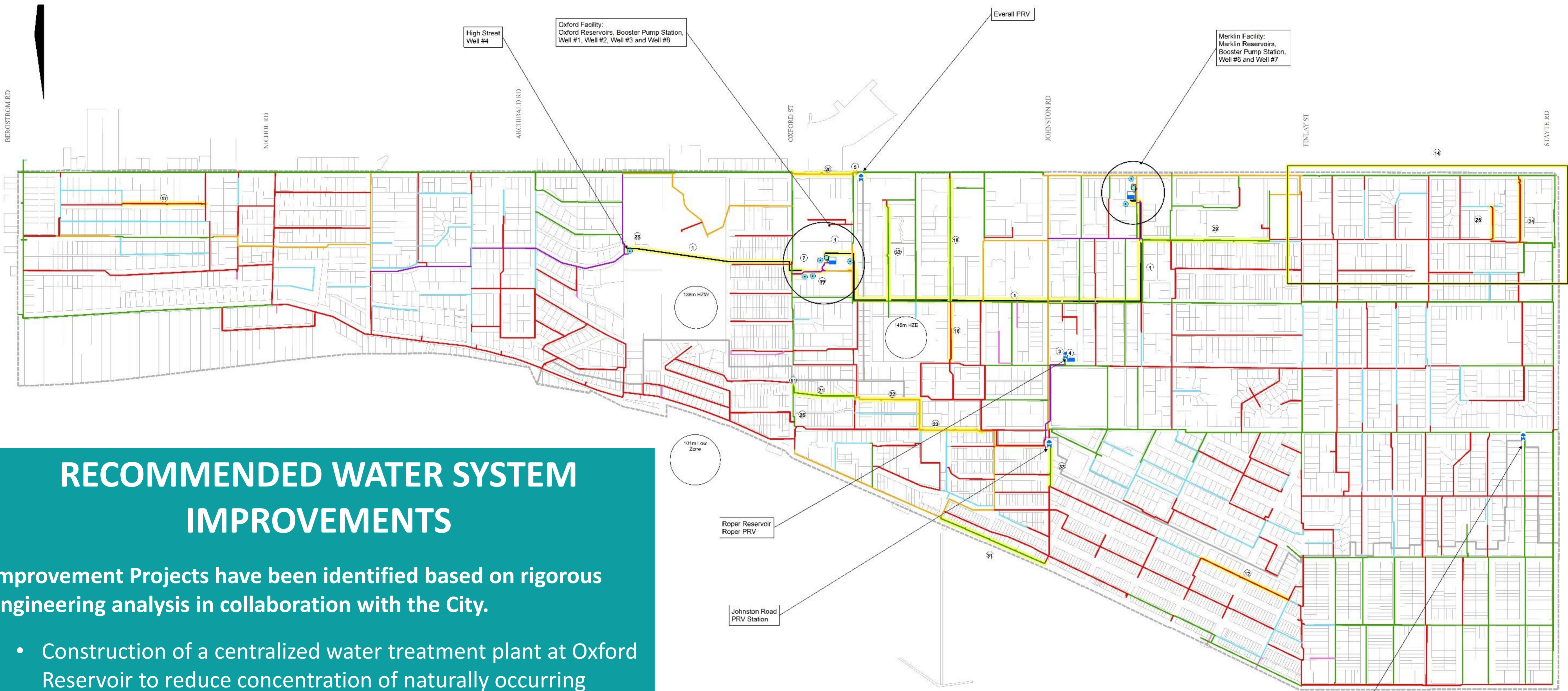
MODEL RESULTS – FIRE FLOW



System improvements have been recommended so that fire flow requirements can be satisfied.

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RECOMMENDED IMPROVEMENTS



RECOMMENDED WATER SYSTEM IMPROVEMENTS

Improvement Projects have been identified based on rigorous engineering analysis in collaboration with the City.

- Construction of a centralized water treatment plant at Oxford Reservoir to reduce concentration of naturally occurring arsenic and manganese
- New well to address degrading condition and improve water supply
- Water main upgrades to increase capacity
- Well electrical upgrades
- Cross Connection Control Program
- Water main replacements to improve reliability
- Improvements to Roper Reservoir and Valve Station
- Strategies to improve emergency protocols and procedures between the City of White Rock and City of Surrey

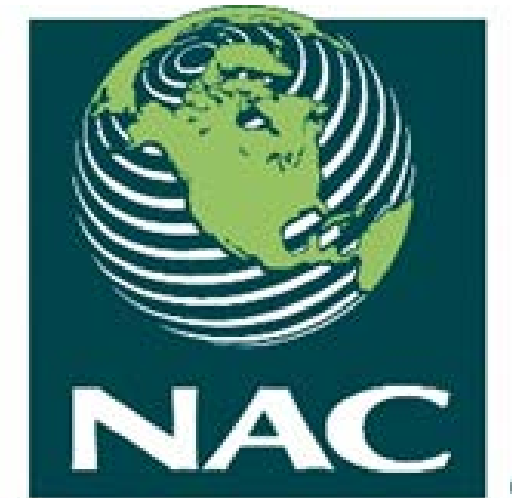
Other Projects:
 27 Surrey Emergency Connection Upgrading
 30 Cross Connection Control

Legend

	Groundwater Well	Water Main Diameter (mm)		250	
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	Pump Station		100		350
	Reservoir		150		400
	Pressure Zone Boundary		200		24 Proposed Upgrade

The total estimated cost for recommended projects is \$20 million

Oxford Water Treatment Project



NAC
CONSTRUCTORS

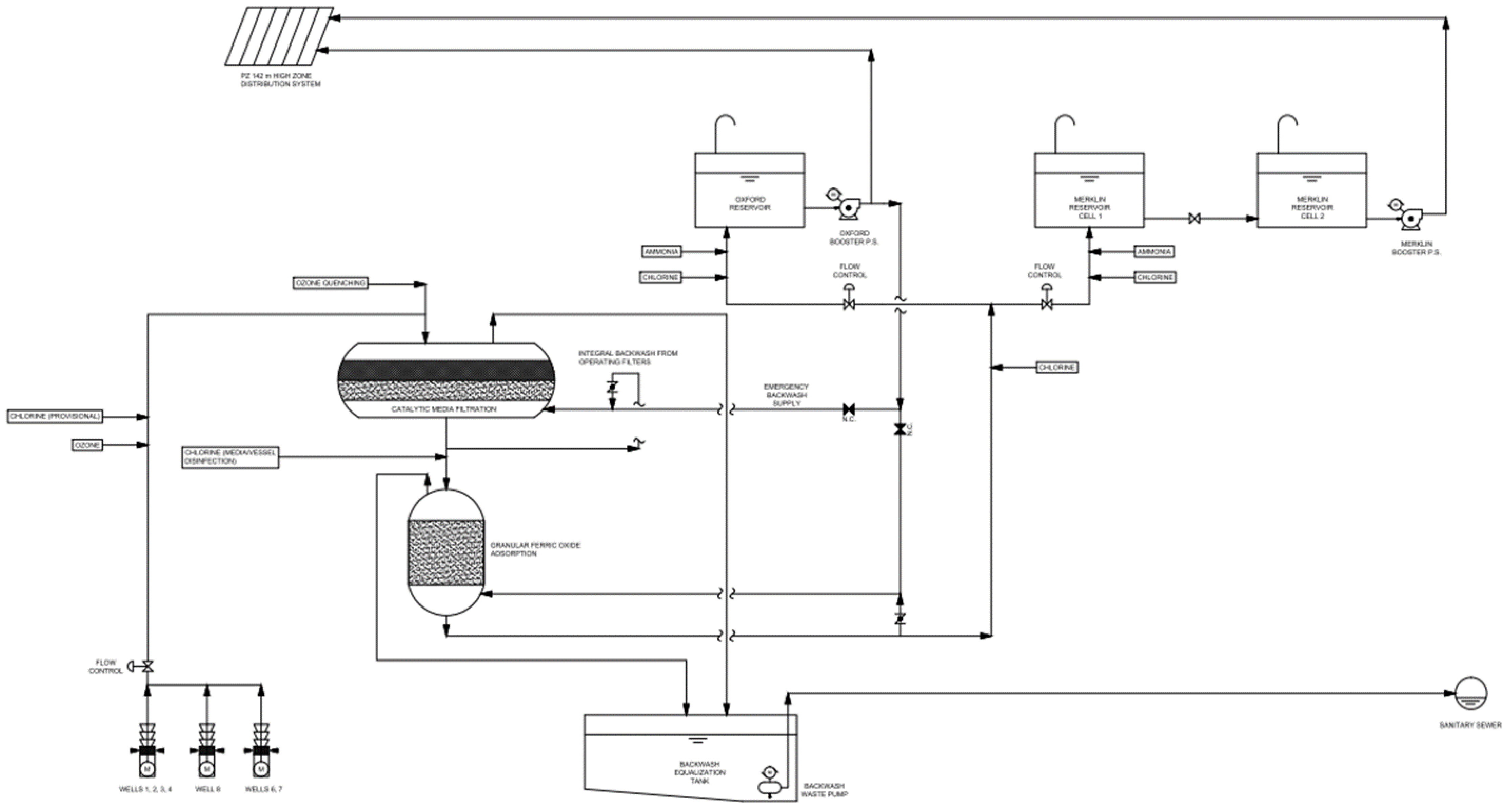


WHITE ROCK
City by the Sea!

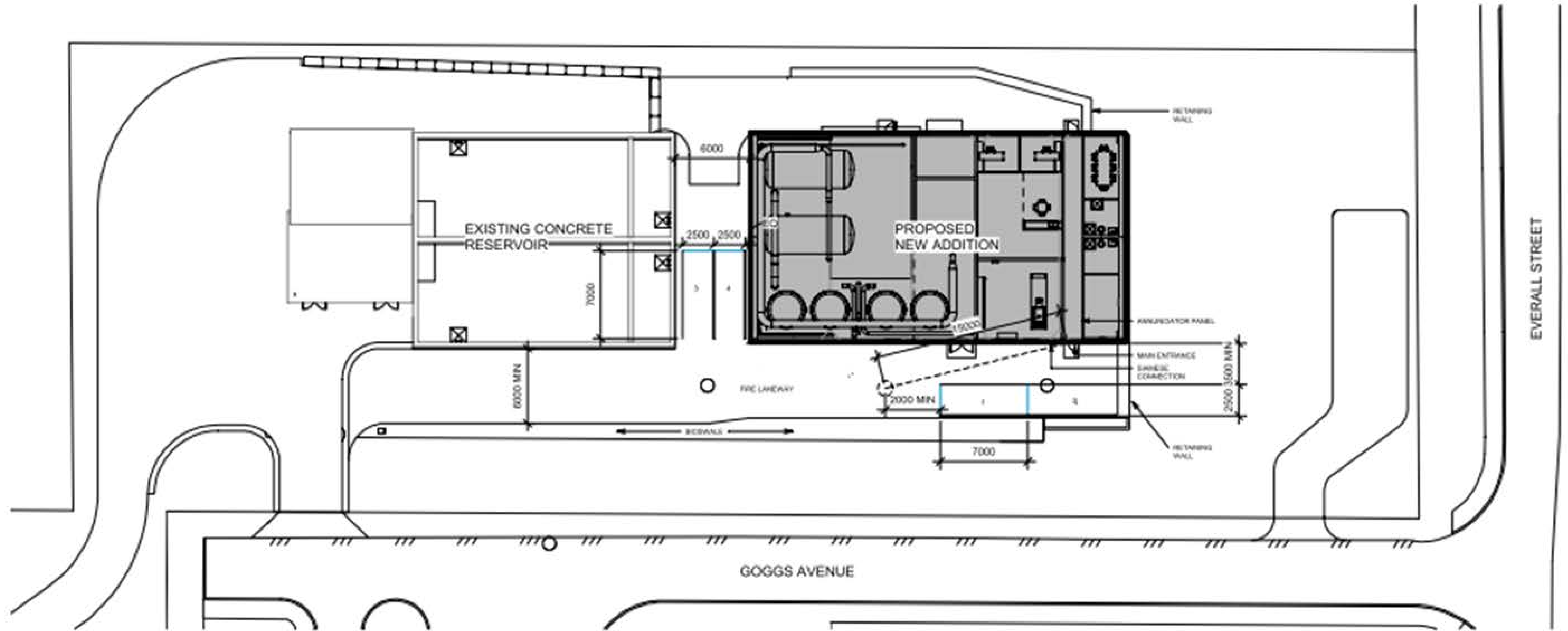
MY CITY
MY WATER



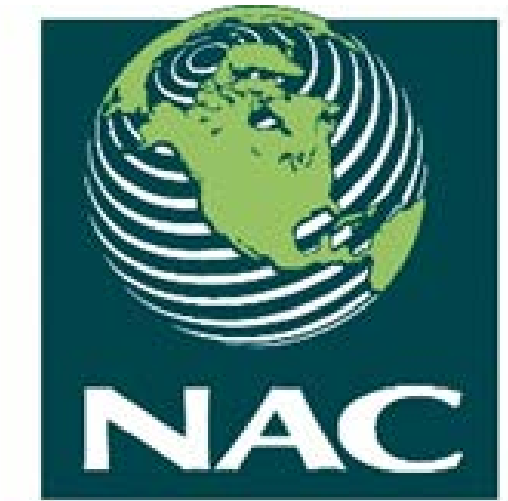
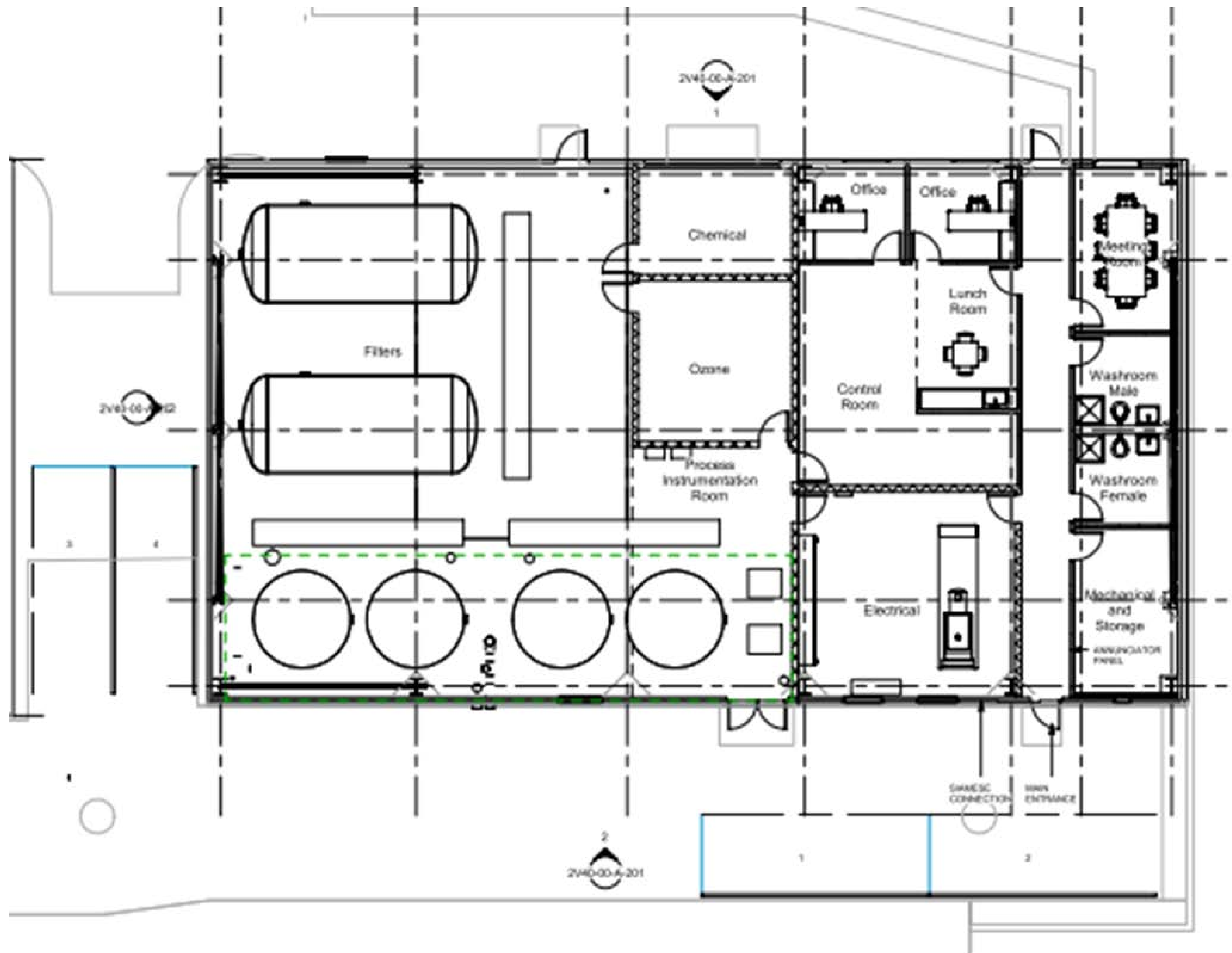
Oxford Water Treatment Project



Oxford Water Treatment Project



Oxford Water Treatment Project



NAC
CONSTRUCTORS

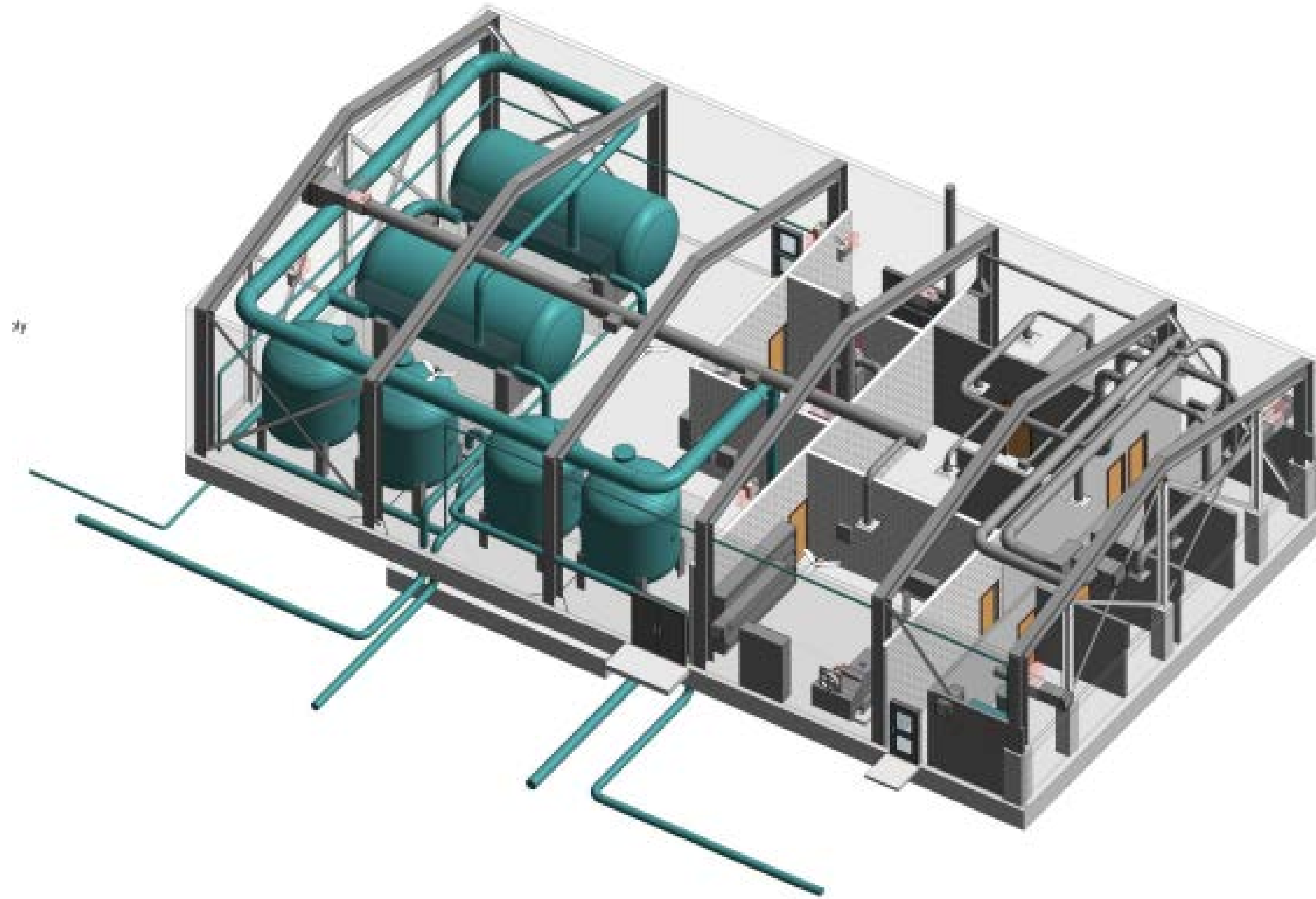


WHITE ROCK
City by the Sea!

MY CITY
MY WATER



Oxford Water Treatment Project



NAC

CONSTRUCTORS



WHITE ROCK
City by the Sea!

MY CITY

MY WATER

