

# CITY OF HUXLEY WATER TREATMENT FACILITY EXPANSION



**VEENSTRA & KIMM, INC.**

**May 12, 2020**



# PROJECT BACKGROUND



This project was initiated from two separate issues:

1. Huxley's growing population may soon exceed the existing Water Treatment Plant's capacity to provide drinking water for the community.
2. Huxley's Wastewater Treatment Facility will receive a new discharge permit that will likely include a limit for effluent chlorides:
  - A byproduct of the current drinking water treatment process is chlorides; the City's current Water Treatment Plant will prevent the Wastewater Treatment Facility from complying with the future effluent chloride limit.

Accordingly, the City needs to look at improvements to the Water Treatment Plant that will meet future demand and allow the Wastewater Treatment Facility to comply with future effluent limits.

# FUTURE USAGE



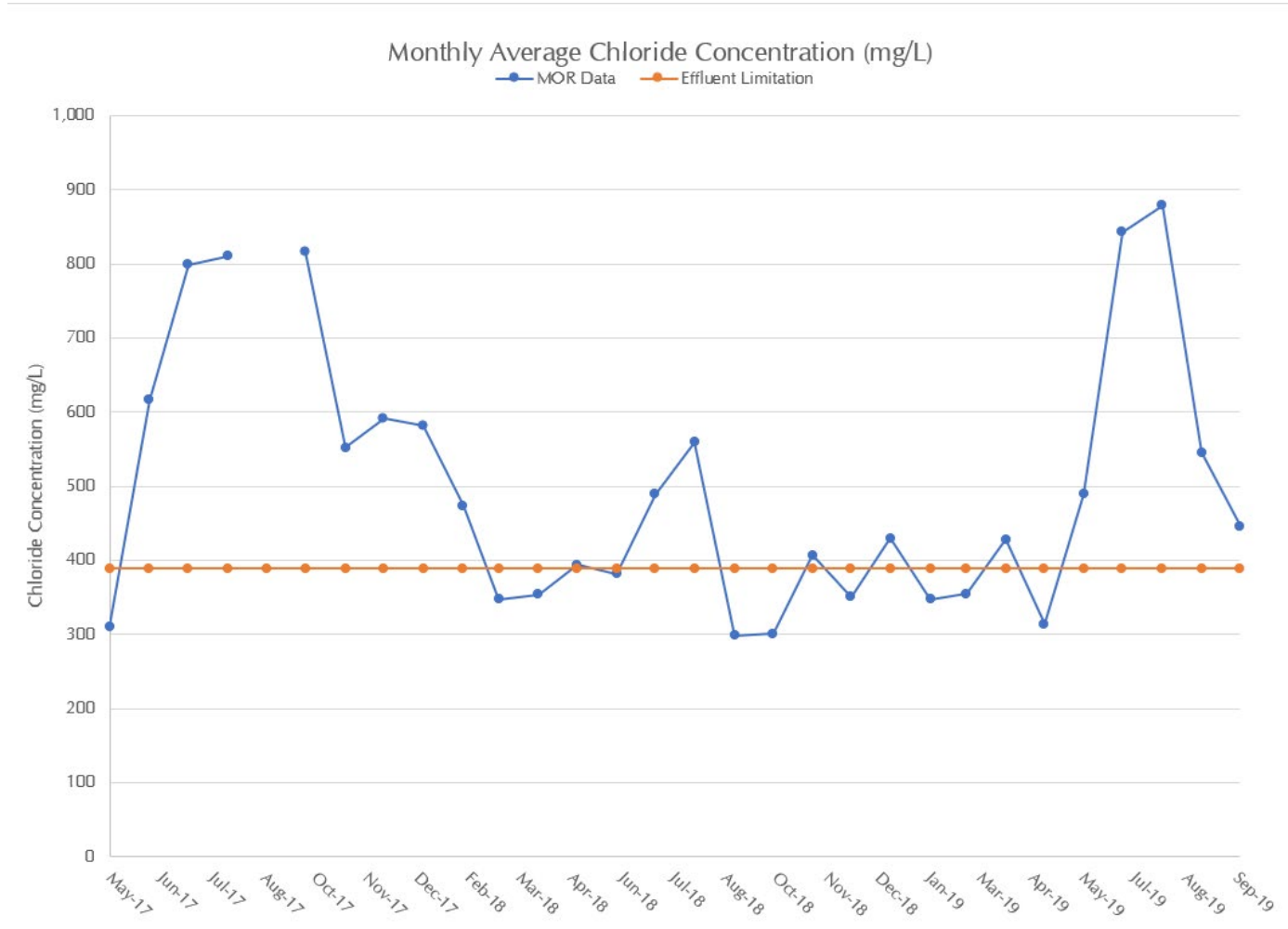
- Population projections show **existing facility will hit capacity between 2023 and 2025;**
- Facility Expansion would utilize design year 2040 with a projected population of 9,014;
- Utilizing the historical per capita usage of 70 gal/day/capita, and 145 gal/day/capita, this would correspond to  
630,980 gal/day for the average usage;  
1,307,030 gal/day for peak usage
- Accordingly, design treatment capacity for the year 2040 would be:
  - **Average Day Capacity: 635,000 gal/day**
  - **Peak Day Capacity: 1, 310,000 gal/day**

# NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT



- Better known as **NPDES Permit**; Permit is for the **City to operate its Wastewater Treatment Facility**;
- Permit is granted by IDNR to regulate discharge of treated wastewater into a stream;
- The City's current Permit is set to expire April 30, 2022
  - Veenstra & Kimm, Inc. anticipates the City's new permit will contain a limit for effluent chloride similar to the limit listed in the City's Waste Load Allocation from November 15, 2016.
  - The new Permit will likely contain a 59 month chloride compliance schedule.
  - Accordingly the City would need to comply with effluent chlorides by 2027.
- Graphs on following slide illustrate the City is consistently in violation of the anticipated chloride limits.

# PERMITTED CHLORIDE EFFLUENT LIMITATIONS



# IMPROVEMENT ALTERNATIVES



1. Abandon existing Treatment Facility, replace with entirely new Lime Softening Facility, add a New Drinking Water Well.
  - Pros: Effective treatment; compliance with future regulations; no chlorides byproduct;
  - Cons: Inability to retrofit existing facility; lime sludge handling;
  - Estimated Project Cost: \$9,650,000
  
2. Add additional pressure filters to meet future demand, abandon existing Ion Exchange Softeners and replace with Reverse Osmosis Filtration Units, add a New Drinking Water Well.
  - Pros: Ability to retrofit existing facility, effective treatment; compliance with future regulations; no chlorides byproduct;
  - Cons: Water loss through R.O.
  - Estimated Project Cost: \$6,100,000
  
3. Add additional pressure filters to meet future demand, replace media in existing Ion Exchange Softeners with a Weak Acid Cation Resin, add a New Drinking Water Well.
  - Well water is unsuitable for this process alternative.



# RECOMMENDED ALTERNATIVE ESTIMATED PROJECT COST



## Recommended Alternative - R.O. Softening Estimated Project Cost

### General Conditions

Bond/Insurance	\$175,000
Sitework	\$35,000
Remove Existing I.E. Softeners	\$10,000

### Water Treatment Plant Equipment

New Low Service Pump	\$50,000
Detention Tank Addition	\$75,000
Aerator	\$125,000
Pressure Filters	\$745,000
Reverse Osmosis Units	\$1,295,000
Process Piping	\$100,000

### Water Treatment Plant Building

Building Addition (65'x60')	\$1,500,000
Electrical/HVAC	\$200,000

### Well Field Expansion

Well Field Expansion	\$530,000
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**Construction Subtotal** \$4,840,000

**Contingency (approx. 10%)** \$480,000

**ESTIMATED BID PRICE** \$5,320,000

**Engineering, Legal, Admin. (approx. 15%)** \$780,000

**ESTIMATED PROJECT COST** \$6,100,000



# SCHEDULE



- Submit Facility Plan Summer 2020
- Submit Final Plans & Specifications Summer 2021
- Award Contract for Construction Fall 2021
- Complete Construction of Improvements Spring 2023