# Water System Facility Plan

## Bayview Water and Sewer District

February 2019



Prepared by

**J-U-B ENGINEERS, Inc.**
7825 Meadowlark Way
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# Abbreviations

| | | | |
|---|---|---|---|
| AC | Asbestos Cement | mg/L | Milligrams Per Liter; same as ppm |
| AL | Action Level | MGAL | Million Gallons |
| AMSL | Above Mean Sea Level | MMM | Multimedia Mitigation |
| BWSD | Bayview Water and Sewer District | MPH | Miles Per Hour |
| cf | Cubic Feet | MRDL | Maximum Residual Disinfectant Level |
| CFR | Code of Federal Regulations | MRDLG | Maximum Residual Disinfectant Level Goals |
| cfs | Cubic Feet per Second | MSL | Mean Sea Level |
| CIP | Capital Improvement Plan | NAA | Non-Attainment Area |
| DDBP | Disinfectants and Disinfection Byproducts | NPDES | National Pollutant Discharge Elimination System |
| District | Bayview Water and Sewer District | $O_2$ | Oxygen |
| DO | Dissolved Oxygen | OEL | Operational Evaluation Level |
| EID | Environmental Information Document | OSHA | Occupational Safety and Health Administration |
| EPA | U.S. Environmental Protection Agency | pCi/L | PicoCuries Per Liter |
| ERU | Equivalent Residential Unit | PLC | Programmable Logic Controller |
| ESA | Endangered Species Act | PM | Particulate Matter |
| FEMA | Federal Emergency Management Agency | PPB | Parts Per Billion; same as µg/L |
| FIRM | Flood Insurance Rate Map | PPD | Pounds Per Day |
| FPM | Feet Per Minute | PPM | Parts Per Million; same as mg/L |
| | | PRV | Pressure Reducing Valve |
| FPS | Feet Per Second | PSI | Pounds per Square Inch |
| ft | Feet | PVC | Polyvinyl Chloride |
| gal | Gallons | PWS | Public Water System |
| GPCD | Gallons Per Capita Day | RTCR | Revised Total Coliform Rule |
| GPD | Gallons Per Day | SCADA | Supervisory Control and Data Acquisition (software for integrating components and monitoring operations) |
| GPM | Gallons Per Minute | sf | Square Feet |
| GWR | Ground Water Rule | SIP | State Implementation Plan |
| HAA5 | Haloacetic Acids 5 | | |
| HDPE | High-Density Polyethylene | TCR | Total Coliform Rule |
| HMI | Human Machine Interface | TDH | Total Dynamic Head |

| | | | |
|---|---|---|---|
| hp | Horsepower | HRT | Hydraulic Residence Time |
| IBOL | Idaho Bureau of Occupational Licenses | MCL | Maximum Contaminant Level |
| IDEQ | Idaho Department of Environmental Quality | MCLG | Maximum Contaminant Level Goals |
| IDAPA | Idaho Administrative Procedures Act | TKN | Total Kjeldahl Nitrogen |
| IDSE | Initial Distribution System Evaluation | TSS | Total Suspended Solids |
| IDWR | Idaho Department of Water Resources | TTHM | Total Trihalomethanes |
| IE | Invert Elevation | USDA | U.S. Department of Agriculture |
| in | Inch | USFWS | U.S. Fish and Wildlife Service |
| J-U-B | J-U-B ENGINEERS, Inc. | UV | Ultraviolet |
| kW | Kilowatt | VFD | Variable Frequency Drive |
| kWh | Kilowatt Hour | VOC | Volatile Organic Compounds |
| lb/day | Pounds Per Day | WRCC | Western Regional Climate Center |
| LCP | Local Control Panel | WQP | Water Quality Parameter |
| LSLR | Lead Service Line Replacement | µg/L | Micrograms per liter; Same as ppb |
| mA | Milliamp | °F | Degrees Fahrenheit |
| MCC | Motor Control Center | °C | Degrees Celsius |

J·U·B ENGINEERS, INC.

# Bayview Water and Sewer District
# Water System Facility Plan

# Introduction



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# TM No. 1 – Introduction

## 1.1 Authorization and Objectives for the Plan

The Bayview Water and Sewer District (the District) authorized J-U-B ENGINEERS, Inc. (J-U-B) to prepare a Water System Facility Plan to evaluate the District's existing water system as well as potential options for water supply, storage, and distribution system upgrades. The Facility Plan is intended to document the District's priorities for upgrades or improvements that may be necessary over a 20-year planning period (i.e., 2017 to 2037).

## 1.2 Area Served by the District

The District owns, operates, and maintains its water supply, storage, and distribution systems (Public Water System ID1280014). It is located in both Kootenai and Bonner County, Idaho near the south end of Lake Pend Oreille and east of the City of Athol, Idaho. **Figure 1-1** shows the current extents of the District, as well as the locations of the wells and storage tanks. It should be noted that some patrons are served by both the District's water and sewer system, while others have only District water or sewer service.

## 1.3 Facility History

The District was formed sometime in the 1970s in order to provide potable water and sewer services for residences and businesses in the Bayview area. At that time, the area was served by numerous wells and small unreliable water systems.

Based on documents found in the Idaho Department of Environmental Quality (IDEQ) archives, the first preliminary engineering report (PER) for the District was prepared in April 1974 and contemplated a new water and sewer system to serve the area. In May 1977, an update to the previous report was completed that addressed the likelihood of the Navy transferring major system components of their existing water system to the District. While they are over 40 years old and now out of date, these reports are included in **Appendix 1-A** for their historical relevance.

With transfer of major system components from the US Navy, the water system became operational sometime around 1978. The Dromore area on the northeast side of Bayview was added around the early 1980s to serve approximately 20 lots on Bannock, Chopunnish, and Duwamish Drives.

In the late 1990s, the District annexed the area that is generally referred to as the Cape Horn Area, along the north side of Scenic Bay of Lake Pend Oreille. At that time, the area was served by individual wells or one of three separate water systems (Pend Oreille Pines, Cape Horn Water Users, and Cape Horn Estates) that drew their water directly from Lake Pend Oreille. In 2002, construction was undertaken and water service was extended from Bayview out to the Cape Horn Area.

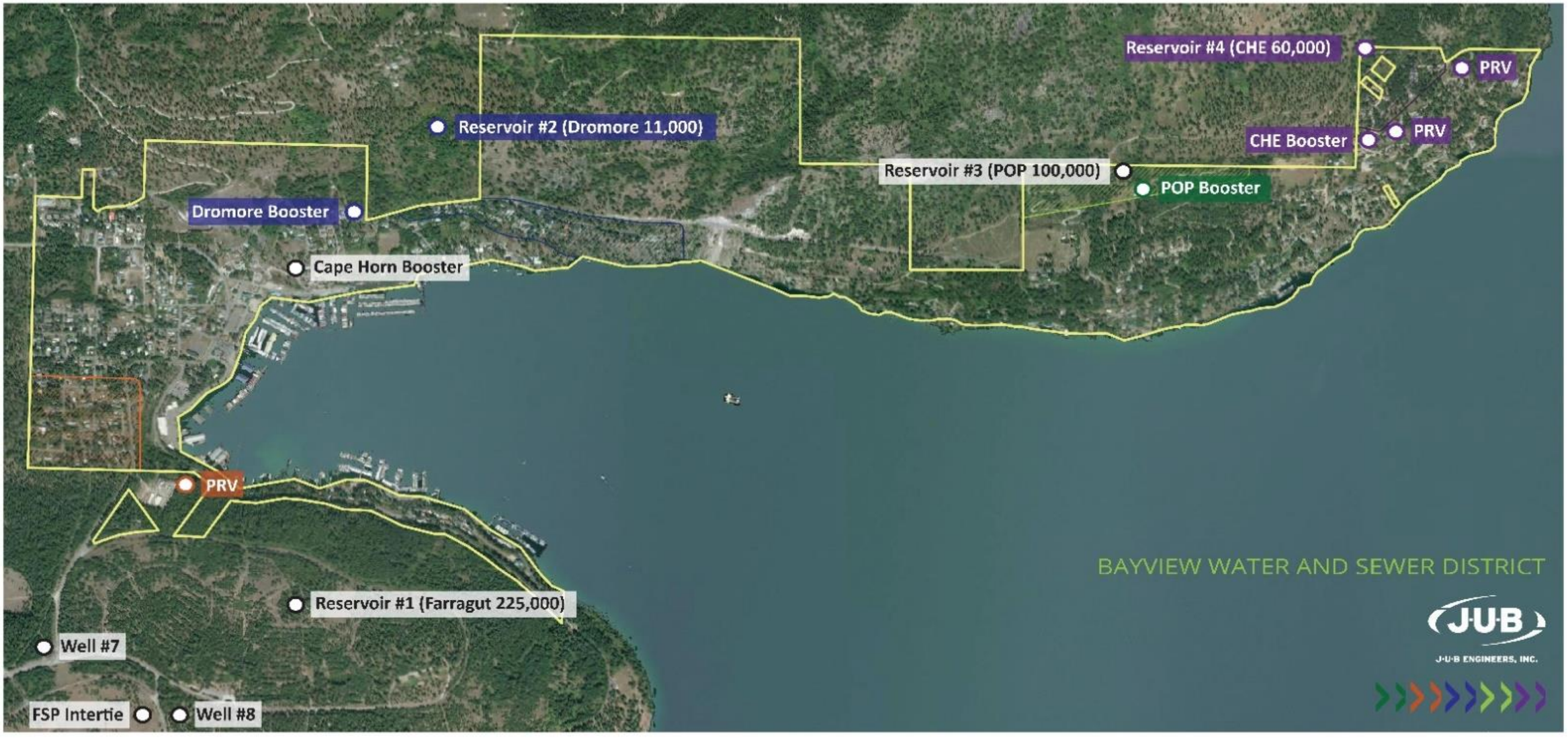
The original components of the Navy water system (mid 1940s construction) which are still currently in service, include:

- Supply
  - Well #7 (primary, 750 gpm).
  - Well #8 (backup, 750 gpm) – Note that this well was originally deeded by the Navy to the State of Idaho in the 1950s along with Farragut State Park but has been leased long-term by the District from the State of Idaho since the late 1980s.
- Storage
  - 38-foot diameter 225,000-gallon cast-in-place elevated concrete storage tank.
- Transmission/distribution
  - Cast iron transmission pipeline ranging in size from 8-inch to 12-inch diameter.
  - Fire hydrants, valves, pressure reducing valves (PRV), and other appurtenances in the Farragut area.

Major system improvements that have been completed since that time include:

- Storage
  - The 11,000-gallon Dromore Tank (+/- 1980).
    - Fed by the duplex 3-hp Dromore booster pump station.
  - Storage in the Cape Horn Area (2002):
    - 100,000-gallon Pend Oreille Pines (POP) Tank.
      - Fed by the duplex 40-hp Cape Horn booster pump station.
    - 60,000-gallon Cape Horn Estates (CHE) Tank.
      - Fed by the simplex 5-hp CHE booster pump station.
- Distribution
  - Bayview Area construction – 2-inch, 4-inch, 6-inch, and 8-inch distribution lines (+/- 1978).
  - Cape Horn Area construction – 6-inch and 8-inch distribution lines (2002).
    - Including a duplex 3-hp Pend Oreille Pines (POP) booster station to supply water to the few homes above the POP Tank.
- Emergency Supply
  - Farragut State Park (FSP) Intertie (2000).

**Figure 1-1 – District Extents and Water System Service Area**



## 1.4 Operations Staff

The District has a staff that oversees the administration, operations, and maintenance of the various components of its water system (i.e., supply, storage, distribution, and system administration). The District's elected a five-member Board of Directors to perform managerial and executive functions, and direct staff activities associated with the water system.

Daily operations and routine maintenance of the water system are conducted by a contract operator (Bob Kuchenski of Integrity Water Management, Inc.). Treasurer and Administrative duties are currently performed by District staff (Jessie Roe). The District office is located at 16401 E. Emerson Drive Bayview, Idaho and is open Monday and Wednesday from 8:00 a.m. to 1:00 p.m.

The District's current water system operator is licensed by the Idaho Bureau of Occupational Licenses (IBOL) with the following certifications:

- Water Distribution II
- Water Treatment II

The District's water system is currently classified as a Class I system according to the IDEQ Public Water System (PWS) classification hierarchy. Therefore, the certificates held by the current water system operator exceed the requirements of IDEQ.

## 1.5 Study Organization

### 1.5.1 Facility Plan

The Facility Plan is comprised of several technical memoranda, summarized as:

***Technical Memorandum 1 – Introduction***

Presents the objectives and scope of the Facility Plan, a general description of the District and its potable water system, and a brief summary of the technical memoranda that comprise the Facility Plan.

***Technical Memorandum 2 – Existing Conditions***

An overview of the existing planning area, population, water use, regulatory issues, and environmental conditions for the District's service area are presented. Current operations, performance, and observed deficiencies of the system are discussed to establish a baseline condition for the system. Hydraulic capacity of the system is analyzed. Population projections will be presented and used to forecast water demand for the 20-year planning period. Existing environmental conditions of the planning area are further discussed in Technical Memorandum 5.

***Technical Memorandum 3 – Development of Improvements***

The system performance and condition will be evaluated over the planning period based on the projected demand, probable performance of the system, known operational deficiencies, and potential regulatory conditions. Improvements and planning level cost opinions for each major system component (i.e., supply, storage, and distribution) are presented based on the assessment performed in Technical Memorandum 2.

***Technical Memorandum 4 – System Alternatives***

Alternatives for the system are presented, compared, and ultimately selected and prioritized for implementation.

***Technical Memorandum 5 – Existing Environmental Conditions of the Planning Area***

A general overview of the existing environmental conditions for the District's service area are presented in this Technical Memorandum. If required, this information can be utilized as the basis for a future Environmental Information Document (EID).

# Appendices (reference attached disk)

Appendix 1-A – Historical Engineering Reports