Water System Facility Plan

Bayview Water and Sewer District

February 2020

Prepared by

J-U-B ENGINEERS, Inc.
7825 Meadowlark Way
Coeur d'Alene, Idaho
(208)762-8787
www.jub.com

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Water System Facility Plan

Bayview Water and Sewer District

February 2020

Prepared by

J-U-B ENGINEERS, Inc.
7825 Meadowlark Way
Coeur d'Alene, Idaho 83815
208-762-8787

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Contents

THIS PAGE WAS INTENTIONALLY LEFT BLANK

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

PROFESSIONAL ENGINEER
REGISTERED
7768
2.24.20
STATE OF IDAHO
STEPHEN P. JAMES

February 2020

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Contents

THIS PAGE WAS INTENTIONALLY LEFT BLANK

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

Appendix 1-A

Historical Engineering Reports

THIS PAGE WAS INTENTIONALLY LEFT BLANK

B-1

PRELIMINARY ENGINEERING REPORT
PLAN AND COST ESTIMATE

For The

PROPOSED DOMESTIC WATER & SEWER SYSTEM

For The

Bayview Water & Sewer District

At

BAYVIEW

In

KOOTENAI COUNTY, IDAHO

April 1, 1974

BOARD OF DIRECTORS

Frank Russell, Chairman
Richard Hansen, Vice Chairman
Vern E. Hubble, Member
Wm. Greenfield, Member
James MacDonald, Member
Mrs. Helen Greenfield, Secretary Treasurer

ENGINEERS

K. A. DURTSCHI & ASSOCIATES
1025 Coeur d'Alene Avenue
Coeur d'Alene, Idaho 83814

Jim
Mc Donald
Hudson Bay Rec

PRELIMINARY ENGINEERING REPORT
AND
COST ESTIMATE
OF
A STUDY OF THE PROPOSED DOMESTIC WATER
& SEWER SYSTEMS
FOR
THE BAYVIEW WATER & SEWER DISTRICT
AT
THE VILLAGE OF BAYVIEW AND ADJACENT LAKESHORE
AREAS ON PEND OREILLE LAKE
IN
KOOTENAI COUNTY, IDAHO

Dated: March 15, 1973

<u>BOARD OF DIRECTORS</u>:

Frank M. Russell, Chairman
Richard J. Hansen, Vice Chairman
James McDonald, Member
William G. Greenfield, Member
Vern E. Hubble, Member
Mrs. Helen Greenfield, Sec'y Treas.

<u>ENGINEERS</u>

K. A. DURTSCHI & ASSOCIATES
1025 Coeur d'Alene Avenue
Coeur d'Alene, Idaho 83814

TABLE OF CONTENTS

PRELIMINARY ENGINEERING REPORT

BAYVIEW WATER & SEWER DISTRICT

SECTION I

GENERAL INFORMATION

A. PURPOSE

The purpose of this report is to present information, preliminary cost estimates, conclusions, and recommendations resulting from an in-depth study of the Bayview Water and Sewer District with respects to the proposed domestic water and sewage facilities to serve the residents thereof. A preliminary design is made a part of the study to determine the project feasibility.

NOTE: It is not the purpose of this report to provide design and construction details. This information will be included in the final plans and specifications after the District residents have decided on the course of action to be taken.

B. GENERAL INFORMATION

The Bayview Water and Sewer District was legally formed by order of the courts in accordance with the laws of the state of Idaho on 19 September 1972. An election for qualified electors was held and passed favoring the formation of the district for the purpose of making the necessary study to determine the project feasibility. Prior to actual construction, residents of the district will be required to have an election to approve bonding authority for the work to be completed. Present state law requires 60% affirmative vote of those qualified electors casting votes for approval.

In keeping with the ever-growing ecological trend, the residents of this very popular resort and retirement community are aware of the serious need to provide protection against contamination of the lake and waterways of this area. While Bayview has long been used as a fishing and boating resort, in recent years the population has mushroomed very rapidly with the increase in retirement housing and the boating traffic until the density has reached serious proportions.

Unlike many recreational areas, Bayview operates pretty much the year around with many full-time residents and a relatively large amount of winter boating due to the winter fishing provided by the "Kokanee" fishing. The U. S. Navy maintains a small experimental station on the bay also in operation throughout the year.

A major problem, in addition to the shore dwellings, is the large number of floating houses on the bay, particularly concentrated at several large marina-type resorts, as well as year around moorage facilities for many larger pleasure boats which often contain both cooking and sanitary facilities.

Because of the density of the population and the extensive transient use of this area, the problem of pollution in this part of Pend Oreille Lake is considered to be of utmost concern to all who use and enjoy this fine natural recreational asset. While the size and depth of Lake Pend Oreille and the relatively cold temperature of the water has helped slow the rate of deterioration, signs of pollution are showing up in increasing frequency in the form of weeds, algea and bacteria counts in a number of areas on the Lake.

It is generally considered that Lake Pend Oreille is the major source of water for the "Rathdrum Prairie Aquifer" which extends south and west to the City of Spokane and is the main water source for the major populated areas of North Idaho and the Spokane area of Washington. This aquifer is regarded to be one of the best fresh water sources in the entire United States.

The original elected Board of Directors for the Bayview District is:

FRANK M. RUSSELL, Chairman
RICHARD J. HANSEN, Vice Chairman
JAMES MCDONALD, Member
WILLIAM G. GREENFIELD, Member
VERN E. HUBBLE, Member
MRS. HELEN GREENFIELD, Secretary-Treasurer

C. SCOPE OF PROJECT

The Bayview Water and Sewer District encompasses an area of approximately 580 acres generally surrounding the westerly end of Scenic Bay near the south end of Lake Pend Oreille. The area is adjacent to the northerly border of Kootenai County in the North Idaho

Panhandle approximately 20 miles north and east of the city of Coeur d'Alene. It is reached by driving 18 miles north on State Highway No. 95 to Athol and then east 7 miles through the Farragut State Park.

The main concentration of population lays on the west end of the bay and consists of a dense assortment of individual houses, mobile homes and camping trailers,all on small sub-divided lots. The balance of the area to be served consists of the lake front properties which includes beach homes, commercial resorts, marinas and more than 100 floating houses.

The Farragut State Park bounds the district on the south and west sides with timbered undeveloped hills on the north. The navy installation occupies a section of the lakeshore in the southwest corner of the bay.

See Exhibit Maps in the back of this report for details of the district and boundaries.

D. EXISTING FACILITIES (Sewer & Water)

(a) Water (Existing)

Domestic water for the residents of the district is generally obtained from individual wells drilled into the aquifer surrounding the lake. In most cases around the lakeshore, these are single privately-owned wells serving one or more homes depending on location and circumstances. There are a number of either privately-owned small water systems or non-profit associations providing water to small groups of residences in the Bayview area. These are, for the most part, hydropneumatic systems, with drilled wells as the water source, serving from 15 to 30 living units.

The naval installation obtains water from the domestic water system of the old Farragut navy base now mostly located in the Farragut State Park. A number of the lake homes along the north shore of the bay obtain water from the lake as wells are not generally successful in the underlying rock in this area.

While the overall picture of water supply is one of a multitude of small public systems and individual wells or lake pumps, our investigations seem to indicate the water quality is generally good and the costs to the users relatively low. The community system, both public and private, charge from $24.00 to $48.00 per year, which is to be considered a bargain in the present market.

The present supplies do not provide sufficient water for efficient fire protection and, as a result, the insurance classification for the district is "unprotected" even though a modern fire truck is available at the navy installation. The small systems are subject to interruptions due to lack of storage capacity and standby backup equipment to protect against power failure and other mechanical problems. They have arranged for interconnection of service of the community systems to aid in case of fire or pump problems. This does help when a power failure strikes the area.

(b) Sewer Facilities (Existing)

Existing sewer facilities consist of individual septic tanks with drainfields. The high density of the small trailers and many summer cabins allow for multiple connections to some septic tanks. However, due to the small lot sizes, the individual units are creating a saturation condition in many areas.

Septic tanks and drainfields appear to work quite well in getting rid of sewage effluent due to the high permeability of the gravel and sand soil (in many areas). We would, however, assume that this fact would indicate a high probability of present or future contamination of the aquifer under the area from which many of the wells draw water.

There are many homes and large resorts located along the shoreline which are constructed only slightly above the high water and, therefore, near to the sub-surface water table which appears to be at or very near to lake elevation. While it is generally believed that this area constitutes a losing section of the lake, that is, water is flowing out of the lake, there is a considerable probability of contamination to some extent occuring in both the lake and the water table from these low lying residences.

A major problem in the bay consists of approximately 100 floating structures which are used as combination boathouses and living quarters and a large number of covered boat moorage facilities, many of which house larger boats with cooking and sanitary facilities aboard.

It is reported that many of the floating cabins and boats use chemical or other retention type toilets but that some have no such equipment and are suspected of dumping raw sewage directly into the lake. In most cases, there are no provisions for holding sink and cooking wastes and the probability is very high that this is also mostly emptied into the lake.

While there are state laws to prevent the use of contaminating sanitary facilities on boats and other floating structures, the difficulty of enforcement and the lack of manpower in the State Health Agency makes enforcement of these laws less than satisfactory. As long as there are no convenient sewerage facilities available, at least some of the people using the lake will tend to ignore the problem and to indiscrimately contribute contamination to the lake waters.

E. TERRAIN

The Bayview Water & Sewer District lays like a large amphitheater around the west end of Scenic Bay. The north and south sides are basically one dwelling deep from the lake with steep slopes from the shore to public roadways located above the building sites. The main Bayview townsite and many adjacent subdivisions are located on the westerly end of the bay. The slope to the lake is more gentle but still quite prominent.

The entire area is timbered with native fir and pine trees cleared only for construction sites.

Soil in the area varies from sand-gravel-clay conglomeration to solid rock. The north side of the lake is basically rock with little or no soil cover in some areas. The south and west shores are sand, gravel and boulder formation.

The normal summer lake elevation is 2062.5 and is lowered to approximately 2051 during winter drawdown. Water level in the lake is controlled by the Corps of Engineers Dam at Albeni Falls Near Newport, Washington on the Pend Oreille River. The land in the district reaches elevation 2250 at the highest house located in the southwest corner of the district. The highest elevations in the district are on the north side.

F. ECONOMY AND PRESENT DEVELOPMENT

The economy of the Bayview District is based almost exclusively upon the recreational industry associated with the lake and related boating, fishing, and retirement living. There are, of course, a few residents who work outside the area in the logging, and aluminum industry. The navy installation is also a year-round facility but has only a skeleton force.

An accurate count of the living and business facilities is somewhat difficult due to the nature of the area and the types of occupancy. The following is the approximate inventory at the time of writing this report:

1. 120 houses privately owned

2. 99 mobile homes privately owned

3. 109 float houses

4. 11 resort marina complexes, including:
   66 camp trailers or campers
   107 mobile homes
   19 motel units
   21 individual cabins
   3 taverns-cafe
   3 office-store
   misc. washrooms-community restrooms etc.

5. Misc. small businesses including:
   1 realty office
   1 store-post office
   1 liquor store
   1 Chamber of Commerce building (old school house)
   1 laundromat

6. Navy installation including:
   4 permanent houses
   1 headquarters building

7. In addition to the above, there are assumed to be a large number of temporary dwellings, campers etc., which come in during the vacation months. A large number of people also maintain boats on the lake in the docking facilities provided at the marinas.

Of the above categories, we are advised that upwards of 200 residences are maintained on a year-around basis either as permanent homes or permanent addresses for people who winter in the south.

SECTION II

PRELIMINARY DESIGN DATA & ASSUMPTIONS

A. GENERAL

The Bayview area presents many of the problems to the design of economically feasible utility systems which are common on many of the popular lakes in north Idaho's mountainous terrain. Among the more challenging items to be considered and overcome are the steep terrain, large differences in elevations of homes away from the lake compared to the lakeshore development, areas of solid rock excavation, floating houses, part-time residences, and the relatively congested area, much of which has restricted public rights-of-way. Often only private sub-standard access is available to many of the homes to be served. In addition, there are very few areas we would consider to be acceptable for the purpose of a sewage treatment facility.

On the positive side, there appears to be an adequate source of excellent quality of water for the proposed water system and the fact that the area is small and congested will tend to reduce costs of both sewer and water systems inasmuch as less pipe line and equipment is required per service.

From the standpoint of basic needs, we would consider the installation of a sewer system to be the more important of the proposed projects. This is particularly so in those areas that are presently obtaining water from drilled wells in the same areas that are being used for individual sewage disposal. The fact that most people are presently supplied with domestic water would indicate some difficulty in the selling of the need for a water system. As was noted, however, the area now is classified as "unprotected" for fire insurance rating which results in an excessive premium structure. It is concurable that the actual user premium cost of the proposed water system can be substantially reduced by the savings to be realized in insurance premiums and that, in fact, the water system might even be an economic asset when considered in the light of the other benefits to be gained from one modern community water supply. For this reason, the report has considered carefully the cost of installation of a new water system and the probable affect in both the reduction of insurance rates and the advantages of uninterrupted service etc.

We can see a very great need for and acceptance of a community sewage collection and treatment facility. The crowded conditions, areas of impervious steep slopes on the north shore and a relatively shallow water table covered with pervious gravel and sand formations from which many wells draw water for domestic use indicates a high probability of some degree of contamination of both the lake and the water aquifer. The high concentration of large boats and floathouses add certain assurance that raw sewage is reaching the lake in quantity.

These facts, combined with the rigid regulations recently passed by the Legislature and State Department of Environmental Protection, make the installation of sanitary facilities almost imperative if the community is to continue to grow and operate as the popular resort area that it has been for many years.

B. POPULATION ESTIMATES

(a) Present Estimate of Population

For the purpose of determining the approximate probable hydraulic and biological loadings of the proposed water and sewer systems, the following estimates are indicated and broken down to a number of equivalent services. In the weighing of the various type of installations, assumed factors of the amount of liquid waste normally produced are used to compile equivalent services for a particular occupancy.

For the purpose of this report an "equivalent service" means a typical household and assumes 3.5 people producing 75 gal of liquid waste per day per capita or 3.5 x 75 = 262.5 gal/day = 1 equiv. service.

1.	120 permanent houses @	120	equiv.	serv.
2.	99 mobile homes (permanent)	99	"	"
3.	109 floating units including:			
	1 resturant est. 150 meals/day @ 10 gal/meal = 150 x 10/262.5	5.7	"	"
	3 marina offices - assume 1/3 ea	1	"	"
	105 floathouses - assume 2/3 ea	70	"	"
4.	11 resorts, marinas, trailer courts etc. including:			
	66 camp trailers or campers assume 2 persons @ 35 gpd 66x2x35/262.5	17.6	"	"
	107 mobile homes - assume 3 persons @ 35 gpd = 107x3x35/262.5	42.8	"	"
	19 motel units - assume 2.5 persons @ 30 gpd = 19x2.5x30/262.5	5.4	"	"
	21 individual cabins - assume 2.5 persons @ 35 gpd = 21x2.5x30/262.5	7	"	"
	3 tavern-cafes @ 100 meals each @ 10 gpm = 3x100x10/262.5	11.4	"	"
	3 office store	3	"	"
	Misc. community facilities restrooms etc. Est.	5		

5. Small Businesses including:

Realty office		1	equiv.	serv.
Store-Post Office		1	"	"
Liquor STore		1	"	"
Chamber of Commerce		1	"	"
1 laundromat	Est.	2	"	"

6. Navy Installation

4 permanent houses		4	"	"
1 headquarters building		1	"	"

7. Boat Pumping Stations (future)Est. 4 " "

Total Est. Equiv. Service 403 Present

(b) Future Population Projections

The existence of the State Park along the south and west sides of the district and the nature of the steep mountainous terrain along the north edge would appear to restrict the possibility of much future expansion of the district boundaries. It is possible that the boundaries could be extended to the northwest along the county road and to some extent easterly along the north shoreline but such expansion would be limited. There are a number of vacant lots in the main Bayview area and several tracts of land mostly along the north side of the district that are as yet unplatted and which will likely be developed in the near future. There is also a very limited amount of expansion capability in the resorts.

Our observation of the map showing existing developments in the district seems to indicate a possible increase of not over 75% and in all probability this would not be fully realized for some time. We do feel obligated to provide a design adequate for the possible future expansion which will include the probability of some larger condominium-type developments such as are rapidly becoming part of the scene on our recreational areas.

We would anticipate for these reasons that the proposed utilities should be designed for approximately 1.75 the estimated present population

∴ for design purposes use 700 equiv. services = 700 x 3.5 = 2450 people

C. PROPOSED WATER SYSTEM - PRELIMINARY DESIGN DATA AND ASSUMPTIONS

The preliminary design of the proposed domestic water system is based upon the following observed facts and assumptions:

1. Water Source

There is an adequate water source in the aquifer to be found almost any where on the south and west sides of the district. The surface of this aquifer stands at lake elevation which varies up and down approximately 11 feet between summer and winter levels.

The tentative location of the proposed well is near the entrance from the park into the Bayview area as shown on the exhibit map. While this will require a deeper well, the pumping head will not be any greater than for a well placed nearer the lakeshore. We feel that the public health officials will be more receptive to the location chosen. However, final decision as to the spot for the well can be made after investigation of available sites and approval of the health department.

We would assume that the water from such a well would be of acceptable quality for use without treatment, especially if the proposed sewage disposal system is completed. The State Health Department will require wells to be located a minimum of 100 feet from any source of possible contamination and that provisions be left for chlorination, if tests prove this necessary. A well should be located at some point generally on the opposite side of the service area from the storage tank.

We are estimating one 24" well approximately 200 feet deep and installation of two deep well submersible pumps with a pump house and fittings as required. The well should extend into the water aquifer at least 60 feet at high water.

The question has arisen on various occasions as to why we do not pump directly from the lake and save the cost of a well. In practice, the cost of an intake structure and pumping plant will exceed that of the well. In addition to this, the health department has taken a stand that surface sources will require a water treatment plant including chlorination.

2. Water Requirements

Water requirements for the system are estimated based upon our count of equivalent households in the district. (See above).

Due to the relatively small lots and the intermittent use of much of the facilities in the district, we assume that the average use of water for an equivalent family unit (3.5 persons) would not be as high as other rural residences in north Idaho where large gardens, yards and livestock are common. For the purpose of this study, we are using an estimated requirement of 400 gallons of water per day per equivalent service as the maximum average use during the periods of hot weather, high demand, and high rate of occupancy in the area. This amount is between that normally used in an urban (city residence) and that used in the average rural community. Such water use varies from 225 to 1000 gallons per day depending upon such factors as yard sizes, types of housing, general standard of living in the area etc.

3. Storage

The obvious solution to storage for this project would be to construct a steel or concrete tank to be located on the north side of the project at approximately elevation 2350. We have selected as our preferred site the area above the old quarry on land owned by Charles Thompson. This area offers the advantage of fairly easy access and a wide choice of sites to allow for placement at the exact location required for optimum pressure in the distribution system. While the indicated site (see plans for location) is our first choice, there are any number of locations along this side of the district that could be utilized.

We are suggesting the construction of a 200,000 gallon steel tank as being a satisfactory size to provide the required storage for domestic use and for a reasonable fire protection capacity. The proposed project would include automatic control of the pumps as required to maintain a full tank capacity at all times except during the highest demand periods.

4. Distribution System

The distribution system for this project would consist of buried water mains of either asbestos cement or P.V.C. plastic pipe. The pipes would be sized to provide adequate capacity for fire protection as well as to reduce friction losses and they would be buried 4'6" below the ground to protect against freezing.

There are two points of concern on the proposed distribution system which will result in added expense and problems.

(a) The district terrain varies from elevation 2250 at the southwest corner to 2062.5 at the lakeshore. In affect, this means that water pressures in the mains sufficient to serve the higher residences would be excessive for those located along the lakeshore. We would like to see the water pressure at the point of use within the limits of 30 p.s.i. low to 85 p.s.i. high. On the Bayview district this could only be accomplished by the installation of two separate pressure zones. This would best be accomplished by the use of a pressure reduction device to lower the pressure in those sections of the system where the static pressures would be excessive.

(b) The second problem is the rock excavation which would obviously be required in the north part of the proposed system. Much of this part of the distribution will require the use of explosives for excavation and special bedding for the pipe. These items, of course, would add substantially to the cost.

5. Water Meters

The preliminary estimate of cost for the proposed water system includes the installation of water meters for all users. This is often a source of public objection as people hate to be regulated. Experience has shown, however, that the installation of water meters on any community system is the best method known to provide control of the system by the district. The added initial expense is considered by the engineer to be a small cost compared to the long term benefits derived. The use of meters also helps to distribute the cost of water more equitably and to require the heavy users to pay their proportionate share of the costs.

As an added reason for including water meters, the Farmers Home Administration will not finance systems without this provision.

6. <u>Fire Hydrants</u>

The preliminary plan also includes installation of fire hydrants. We understand that the navy maintains fire fighting equipment which has been made available on call to the residents of the area. The crew is provided on a voluntary basis and the equipment is available for use within a 5-mile radius of the navy base.

A request for survey of the Bayview area by the Idaho Fire Rating Board based upon the proposed system has been made. Indication of the requirements and the fire rating to be applied will enable us to obtain information on the reduction of insurance rates to be expected if the system is installed as tentatively planned. Advance indications are that the changing from an "Unprotected" classification to a Class "9" or better would result in very substantial savings in insurance costs to the residents of the district. (See attached letter.)

7. <u>Electric Power</u>

Electric power is available as required. Kootenai Electric Co-operative is the utility serving the Bayview area. We would anticipate the use of 3-phase 440 volt power for pumping water at the well site.

8. <u>Rights-of-Way</u>

Installation of the proposed pipe lines would be generally in public roadways. There are, however, areas where the roads are private and very narrow. Easements will be required and very careful planning is a must to serve these areas.

9. <u>Water Service Connections</u>

It is proposed that the District would provide service to each user by installing a meter at the property line. The user would then be responsible to make his own connection to the house or other point of use.

D. PROPOSED SEWER SYSTEM

(a) General

While the installation of a satisfactory domestic water system for the Bayview area appears to be a relatively simple matter, the problems of providing sewage collection and treatment is another story. Part of the project lends itself to conventional gravity methods of sewage collection while for other areas we must consider some method of pumping or barging to get the sewage to a common location for treatment. This study has considered several alternate methods of both collecting and treating the sewage keeping in mind the ultimate cost and the fact that much of the potential user load is of the short duration or part-time nature.

Present day requirements of both state and federal agencies, who control or dictate to some extent the criteria for sewage effluent quality, have been increasingly strict. It is now considered a minimum standard that at least secondary treatment be incorporated into all sewage treatment facilities and that effluents from such plants be so controlled and disposed of as to insure little or no adverse affect on the ecology of the area.

Secondary sewage treatment means, in general, at least 85% removal of the bio-chemical oxygen demand of the sewage ($B.O.D._5$) and 85 to 95% removal of suspended solids from the effluent leaving the plant. These requirements are not normally difficult to obtain with modern treatment techniques provided the plant is properly designed to begin with and equally important that it is operated and maintained in a proper manner.

Herein lies a real problem for sewage disposal in small communities such as Bayview. It is often very difficult to find trained responsible personnel to operate a small sewage plant on a part-time basis and the cost of full-time maintenance adds substantially to the cost of the sewer fees where the number of users is relatively small. We consider the maintenance problem to be the most pressing for the District to solve and for this reason our preliminary design is based upon providing facilities which are as maintenance and trouble free as is possible while still recognizing the need to hold the overall costs in line.

(b) Collection System

In general, it appears feasible to collect a large part of the sewage by means of a conventional gravity system utilizing sewer lines and manholes constructed to line and grade so as to carry liquid waste to a central location from which it can be pumped or otherwise transported to the point of treatment. The entire west end of the project and a portion of the north side lays on terrain which will allow for gravity collection to a low point near the existing liquor store.

Our proposed plan anticipates such collection in the appropriate areas using 8" or larger gravity mains of either P.V.C. plastic pipe or asbestos cement sewer pipes with manholes at such locations as may be required for grade or line changes etc. At the above-mentioned collection point, it will be necessary to install a sewage lift station (pumping plant) to force the sewage uphill through a pressure force main to the point of treatment.

For the gravity parts of the proposed system, we would anticipate installation of the sewer mains to be in the roadways with connection tees in the mains at locations convenient for the connection of the house lines by the owner.

Because of the nature of the housing in the Bayview area, we would anticipate pipe depths adequate to drain ground floor or above facilities only. There may be an occasional below grade house drain which would require the owner to provide pumping to reach the sewer. The number of basements are very few in the district and then mostly of a daylight construction.

This leaves those areas along the south shoreline from Redmonds Resort to and including the naval shops and along the north shoreline from the Hansen farm to the east boundary as well as the floating boathouses and boat sanitation facilities to be considered. We have studied the possibility of providing collection to those locations by any one of several means as listed below:

1. Sewage could be collected by piping to numerous holding tanks to be located at convenient places along the shoreline and on the docks supporting marinas and floathouses. This would then require a barge service to pump the holding tanks and transport the sewage to a point for pumping into the lift station mentioned above.

   Advantages of this method would be particularly evident in the providing of boat dumping and floathouse control. It would also be relatively convenient for the larger marinas to collect sewage to one location from a number of land based cabins and trailer spaces.

   The disadvantages, however, are considered to be greater than the advantages. The cost of a barging system, particularly to operate during off season months when only an occasional residence is in use, would be prohibitive. There would also be difficulty in serving many of the scattered tanks during periods of low water and bad weather when the shoreline recedes leaving many docks and waterside facilities high and dry.

2. Consideration was given to the installation of septic tank and effluent pumps at the individual services by the District with a pressure force main to carry the effluent to the main system. This method is used in the design of sewer systems on Priest Lake which are scheduled for construction this summer. We feel that this would be a workable system. In the Priest Lake systems the district installs and maintains the individual pumps and septic tanks. This, of course, requires a maintenance set up more elaborate than the normal gravity collection and we are concerned again for the cost involved where the number of such installations is small compared to the total number of services. In addition to the repair of pumps and related equipment, the District would need to maintain facilities to pump septic tanks as may be required.

This type of approach to the problem would not provide service to floating houses and boats who would need to find some method of bringing sewage to the shore installations. In the case of clusters of such floating houses at a common dock, this might well be handled by the use of holding tanks to be pumped and transported to the septic tank in small "honey carts" either on an individual basis or as a service provided by the resort.

The idea of providing a flexible sewage line to the shore on the docks is considered to be impractical due to the instability of the docks and the 11-foot water level variation between seasons.

3. Because of the relative cost and the transitory nature of many of the campers, trailers and other users in the areas requiring pumping of sewage, we are in favor of simplifying the District's responsibility in these areas by installing and maintaining only the pressure lines in the roadways. This approach would require that the individual users and resorts provide the needed pumping equipment to force their own sewage to the force main. This could be done with either grinder pumps to pump the total raw sewage or by the use of existing septic tanks and small pumping units to pump septic tank effluent to the sewer system.

The proposed plan would relieve the district of the responsibility of maintaining pumps and equipment for individual users. It is recognized that such a plan will provide a somewhat less degree of service to this group of users and we would expect the user fees to be adjusted to allow for this fact.

We would visualize a system of boat pumping stations to be located and installed by the larger marinas and for the use of which a fee would be charged by the resort owner to defray his costs.

In summary, we are proposing a gravity collection system to serve the main Bayview area combined with a fail-safe pumping station to lift sewage from the low point on the collection system to the point of treatment. The balance of the collection system along the north and south shorelines would be in the form of pressure mains laid in the roadways. See maps in this report for details of the proposed project layout.

(c) Treatment

There are a number of methods of sewage treatment commonly in use at the present time. They all, for the most part, fall into two basic categories; namely, biological treatment processes and physical chemical processes. To some extent most plants combine some combination of both. However, the more common methods in wide use today tends toward the biological treatment.

The strictly physical chemical plant normally uses, as the name implies, physical and chemical means of removing the contaminating substances from the water. Because of the relatively undeveloped state of this process and the costs and other problems for a system, such as Bayview, we do not consider this method of treatment to be an economically acceptable solution for this project. A great deal of study and research on small physical chemical package plants is under way at the present time.

Biological treatment means, in affect, the stabilization of organic matter in the sewage by the creation of a favorable environment for the action of sewage bacteria which ultimately results in the creation of stable compounds. In affect, the sewage is used as a food for the propagation of bacterial colonies which change the organic wastes to stable compounds such as water, carbon dioxide etc. Sterilization of the final effluent normally follows to provide an acceptable quality of water to be returned to the natural environment.

The biological processes are further broken down into two divisions depending upon the conditions in the sewage and the resulting type of bacterial growth.

Where there is a lack of dissolved oxygen in the sewage, the process is said to be anerobic in nature. This process is similar to that operating in septic tanks and the sludge digestors in a treatment plant. One of the by-products of anerobic digestion is hydrogen sulfide gas which has both an obnoxious odor and is flammable.

Where the liquid waste contains adequate dissolved oxygen, a different strain of bacteria operate to create an aerobic process where the sewage is stabilized by changing the organics to basically carbon dioxide and water which is a much more desirable condition especially where odors will be a problem.

The actual treatment of sewage is a normally complicated process and includes a number of other operations such as grit removal, grinding, settling, aeration, clarification and others depending on the process and equipment used.

There are presently many companies bringing into the market so called "biological package plants" which are supposedly designed to treat sewage at relatively high rates and to be somewhat automatic and require little maintenance.

Our experience and observation, however, have led us to look with some doubt on the claims made for these units in that they are often subject to various upsets from changing conditions which occur, particularly on small systems such as Bayview. The sewage loading in a resort area is subject to wide and often sudden variations. This is because the population changes drastically even during a given week.

The State Public Health officials are also skeptical of "package plants" and have not considered them to be approvable in most instances.

The most common and satisfactory approach to sewage treatment in small rural towns in the north Idaho area has been the use of stabilization ponds (lagoons). More recent installations have been equipped with mechanical aeration equipment. This allows for much better control, reduced land requirements and less problems or possibility of the facility becoming a nuisance due to odor. Experience with this type of sewage treatment has been successful in the north Idaho area and has produced excellent treatment of domestic wastes especially in those units which have been properly designed, operated and maintained.

The aerated lagoon is a slow rate biological treatment process often consisting of a combination of aerobic digestion in the upper portion of the pond and anerobic digestion of the solids that settle to the bottom. (This type of plant is said to be faculative). The sewage normally requires 10 to 30 days to pass through the unit and the treated effluent is then sterilized and passed on either to a receiving stream or body of water or can be sprinkled on the adjacent land aiding in the growth of crops or timber as the case may be.

While a properly designed and operated stabilization lagoon provides a high degree of treatment for the removal of $B.O.D._5$ and suspended solids, it does not remove such dissolved nutrients as phosphates and nitrates. The trend is now to eliminate the dumping of effluent containing these nutrients into the lakes as they encourage unwanted plant growth and ultimately the destruction of the potential of the lake for recreation.

The removal of nutrients require tertiary treatment which is costly and often difficult. For this reason, we favor sprinkling of the effluent at controlled rates to allow the nutrients to be utilized for land crops as stated above.

For the reasons stated, we are recommending the use of an aerated stabilization lagoon for the Bayview District using blower compressed air for aeration, chlorine for sterilization of the effluent and sprinkling of any effluent not removed by normal evaporation from the pond surface.

The construction of the proposed treatment facilities will require an area of approximately 20 acres of relatively flat land which is both remote enough from town to eliminate objections from the people and of a suitable vegatation cover and soil composition to allow for sprinkling. The holding ponds will have to be sealed by either natural soils or by the use of a sealing blanket such as bentonite or the plastic or rubber sheet liners now in common use.

The only locations in the Bayview District area we feel will meet the requirements for the treatment facility lay to the west of the proposed project. We have located two sites which we feel would provide adequate space and the other features required. The first choice would be a site located in the Farragut State Park boundaries in an undeveloped section and approximately 1100 feet west of the west boundary of the sewer district. Our information is that this particular area of the park is actually controlled by the State Fish and Game Department. We have made inquiries as to its availability but have not received an answer as yet.

Our second choice for the lagoon would be a site located further to the west and on the north side of the county road leading out of Bayview along the north edge of the park. This site is approximately 1.0 mile west of the district boundary and is the second choice only in that the distance to pump and the pumping head is greater requiring an additional cost for lift stations and power costs. Site No. 2 is on private property owned by several parties.

In the case of either site the area is timbered with small jackpine and brush and would provide adequate vegatation for the proposed sprinkling area. The soil is basically a sand and gravel with clay mixture. Our estimates include the cost of providing an adequate sealing blanket in all ponds to insure retention of the liquid waste in the plant. We would anticipate a pond capacity of sufficient size to be total containing during the winter months when the loading is relatively low and to sprinkle treated effluent in the wooded areas provided during the summer months.

One dual pump lift station and a pressure interceptor sewer main from the pumps to the ponds will be required. Final decision on the location of the treatment facilities will dictate the possible need for a second pumping station if the heads become excessive.

In any event we would consider the nature of the proposed system to be such as to require a fail-safe pumping facility. For this reason, we are including the cost of standby pumping power in the form of a liquified gas powered generator to operate the pumps in the event of power outage. This unit would be controlled to take over the operation automatically in the event of power failure. Such equipment, of course, adds considerably to the cost of the project but is considered essential in view of the problems that would be caused by any prolonged overflow of sewage in the very congested area where the pumping station must be located.

A power failure would also shut down operation of the blower units in the treatment plant. This would not create any problem, however, unless the problem was of an extended duration.

E. PRELIMINARY DESIGN ASSUMPTION FOR TREATMENT FACILITIES

1.	Design year	20 years hence	1993
2.	Est. economic life of system		30 years
3.	Est. present population (400 x 3.5) max. day		1400
4.	Est. population equiv. design year (max. day) 1.75 x 1400		2450
	For average max. weekly population* equiv. use		2000/day
5.	Est. max. liquid waste per day @ 75 gal/capita = 2000 x 75		150,000 gal/day*
6.	Est. B.O.D.$_5$ (bio-chemical oxygen demand)		.17#/capita/day
	Total est. B.O.D.$_5$ per day for max. week = 2000 x .17 =		340#/day

7. Assume all liquid waste to be domestic only. No anticipated industrial wastes.

8. Assume minimum 10 day retention in areated ponds.

9. Assume finishing pond capable of holding total sewage during winter months.

10. Assume sprinkling of effluent during summer at a rate of 1" per week in wooded areas.

NOTE: 75 gpdpc is considered high for the average on a lake installation due to the intermittent nature of a large part of the population.

*Due to the fact that the maximum daily population occurs on a weekend and that the proposed treatment requires 10 or more days, the design equivalent is reduced to reflect an estimated average population throughout the week.

F. LAND & RIGHTS-OF-WAY

The installation of either or both of the proposed systems will require the attaining by purchase or easement of land for various requirements. Among those requirements would be the following:

1. From the navy installation, an easement for the location of both water and sewer mains and for the proposed well site. The navy boundaries are said to include a section of the roadway around the south edge of the bay leading to Hudson Bay and Redmond's Resorts.

2. From the State of Idaho Parks Department or Fish & Game Department, an easement or sale of land for proposed lagoon site No. 1 along with an easement for the pipe lines to the district. In the event proposed site No. 2 is used, this would be a purchase of land from the private owners.

3. From the highway district, a permit will be required for the installation in all district roadways of pipe lines for both sewer and water systems.

4. From private individuals, a site for the proposed tank and easements over a number of private roadways not dedicated to the public.

G. FINANCING

The most important problem to be faced by a water and sewer district is usually to find an acceptable method by which construction of the proposed systems can be financed. Due to present high interest rates and the relatively low valuation found in rural areas, it has been difficult to acquire financing from private sources. For this reason, most water and sewer projects of recent times have had to resort to the use of various government agencies for construction financing. In a district this has been generally accomplished by issuing General Obligation Bonds which are purchased by the lending agency.

In addition, there have been a number of federal and state agencies which have grant funds to be used to help relieve the burden on the property owner, especially in those cases where the cost of construction will be prohibitive.

At the present time, the two agencies most active in the water and sewer funding field have been the Farmers Home Administration and the Environmental Protection Agency. Recent action by the government has brought about rather drastic reductions in the funding programs of both of these agencies however, and the status of grants at this point is not completely clear.

The most recent information indicates that the Farmers Home Administration (FHA) still has a loan program whereby they can provide insured loans or can purchase bonds of legally organized groups at very reasonable interest rates. The FHA grant program has been discontinued, at least for the present. We are advised that the loan program is at this time adequately funded.

The Environmental Protection Agency (EPA) has for some time administered a grant program designed primarily to aid in construction of the treatment and interceptor portions of sewer projects. The most recent information indicates this program to still be in operation but somewhat reduced in capacity. Due to the reduction in grant funds, it is understood that the EPA grants are running somewhat behind the demand at this time.

Recent changes in the federal laws and procedures have placed the administration of the EPA funding programs under control of the individual State Environmental Protection Agencies, a part of the State Health Department in Idaho.

The EPA can grant up to 75% of the cost of those parts of a sewer project known as eligible portions which, in general, include the lift stations, main interceptor lines, treatment plant and outfall lines. The actual determination of the limits of the eligible part of any project is determined by the Agency.

In addition to the above, the State of Idaho also has a program whereby they can grant up to 25% of the same eligible items considered by EPA.

The recent changes referred to above have also provided that, under some conditions, the entire project may be considered to be eligible for grants. This appears to be subject to conditions yet to be defined.

It is then possible under these circumstances to obtain grants up to 100% of the so-called eligible portions of the sewer project. We know of no grant monies available at this time for the balance of the sewer system or for any part of the proposed water system improvements.

NOTE: The Farmers Home Administration has already been approached on this matter and have indicated their willingness to help where possible. No commitment has been made.

H. REVENUE TO REPAY BONDED INDEBTEDNESS

It is generally required that a city or district issue General Obligation Bonds for construction work of the type anticipated. Such bonds carry an obligation to the property served in that the district has taxing powers to obtain required revenue. It is the usual practice, however, that revenue be obtained from the users as a monthly fee for service and that the taxing powers be used only for such things as preliminary costs and as a lever to collect delinquent billings.

The recommended practice is for a basic user fee for water used up to a set minimum amount. Excess water is then paid for at extra cost.

Sewer fees are normally charged as a monthly fixed service fee with business and other unusual contributors paying a pro-rated fee depending upon the equivalent use compared to an average household.

An alternate method of determining the sewer fee often used is to base the monthly rate on the amount of water used. This, of course, would be applicable only if the district were to construct both utilties.

An initial service fee for connection to the sewer and water systems is also a way to raise a portion of the funds required to construct, maintain and operate the systems. In general, such fees are held to a minimum amount for the initial services at the time of construction and are increased for future connections.

I. ADDRESSES OF GOVERNMENTAL AGENCIES

PHS - Department of Health
P. O. Box 637
Lewiston Idaho

Attention: Mr. Jim Kimball
Acting Regional Environmental Supervisor

FHA - Department of Agriculture
County Office
Farmers Home Administration
P. O. Box 849
Coeur d'Alene, Idaho

Attention: Mr. Jack Nelson
County Supervisor

EDA - Department of Commerce
Economic Development Administration
Western Area Office
415 First North
Seattle, Washington

EPA - Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington

Attention: Mr. Richard Thiel

SECTION III

MAINTENANCE AND OPERATION

An important problem facing the small water and sewer districts is that of maintenance of facilities once they have been completed. We find from experience that, particularly in the case of small sewer systems, the problem of obtaining competent part-time manpower to maintain and opeate the facilities at the efficiency for which they were designed, sometimes is a very difficult problem. For this reason, we stress that only by proper preventive maintenance and operation of the sewer system, can the District expect to obtain a high degree of treatment and acceptable service from their equipment. We are, therefor, placing particular emphasis on the maintenance of the sewer system as compared to the water system.

If at all possible, we would feel that the District should consider the appointment of a full-time maintenance man and that he be provided with the necessary tools and equipment for operation of the proposed system. We would assume that most of his time would be spent in the maintenance of this sewer system and that the operation of the water system could be handled by the same man but with considerably less of his time.

Both utilities are designed to hold maintenance procedure to an absolute minimum. But once again, experience has shown that a careful preventive maintenance program will pay in the long run in the overall costs of maintaining the systems.

In general, the sewer system will require flushing of the sewer mains from time to time. It will require a regular inspection of the pumps and the blower equipment in the treatment ponds and it will require a certain amount of testing and reporting to the public health agencies in charge of environmental protection in the state.

It has been the practice in the past for the State Health Department to hold "short schools" at which time plant operators and prospective plant operators can be educated in the actual procedures necessary for the testing and operation of sewage treatment plants. These schools are free to the District except for the per diem and traveling costs which would have to be provided.

As far as the water system is concerned, we would anticipate very little maintenance, particularly in the earlier years other than a routine check that the equipment is functioning properly.

The efficiency of the maintenance personnel or maintenance man is basically affected by several things: First, his knowledge of the systems; secondly, by the equipment with which he has to work and, lastly, by his willingness and initiative. The amount of tools and equipment for a small system should not be excessive but he must be provided with the basic hand tools, transportation and a shelter for maintenance equipment, supplies and the limited amount of testing that will be required of him.

In addition to the training mentioned above, the maintenance man for these projects will also be provided with an operation and maintenance manual which will outline the necessary maintenance procedures and also contain various manufacturer's literature covering the equipment with which he will be working. We also mention that the construction contract requires that the entire system be guaranteed for a period of one year by the contractors and the suppliers of the equipment. This is considered sufficient operating time to perfect the system and remove any operating difficulties that may occur due to defective equipment or workmanship in the construction of the projects.

The second major component of operation and maintenance costs will be the cost of electric power. The size and nature of the systems will require 3-phase electricity which is available from the Kootenai Electric Co-op who is the servicing electric utility. The power rates for installations of this type are based upon the installed capacity which, unfortunately, results in the payment for more power than is actually used in many cases. That is to say, that it is doubtful that the system would use sufficient power during most of the year to accumulate electricity costs equal to the minimum required by the utility due to the minimum installed capacity charges. We would assume that with the exceptions of one or two summer months when water demand and sewage are high that the minimum costs would cover the requirements of the system.

BAYVIEW - PRELIMINARY ESTIMATE

SECTION IV

FINANCIAL INFORMATION

I. WATER

A. Engineer's Preliminary Cost Estimate

		Quan.	Unit	Unit Price	Amount
1.	10" Water Main	4,300	L.F.	5.50	23,650.
2.	8" Water Main	3,300	L.F.	4.20	13,860
3.	6" Water Main	17,300	L.F.	3.75	64,875
4.	4" Water Main	9,100	L.F.	2.50	22,750
5.	2" Water Main	1,250	L.F.	2.00	2,500
6.	Additional for Rock Exc. for Pipe Line	3,500	L.F.	2.00	7,000
7.	Service Lines	8,000	L.F.	1.35	10,800
8.	Fire Hydrants w/valve	14	Ea.	450.00	6,300
9.	2" Meter Installations	10	Ea.	750.00	7,500
10.	1" Meter Installations	5	Ea.	300.00	1,500
11.	3/4" Meter Installations	250	Ea.	150.00	37,500
12.	Pressure Reducing Stations	3	Ea.	850.00	2,550
13.	Well (Complete w/pump & house)	1	L.S.	25,000.00	25,000
14.	Storage Tank	1	L.S.	40,000.00	40,000
	Sub Total				265,785
	5% for Valves & Fittings (Pipe Line Items) (1-7) 145,435				7,272
	Sub Total				273,057
	10% Contingencies				27,306
	Sub Total				300,363
	Legal (3%)				9,011
	Engineering incl. Inspection Costs				45,000
	Land & R/W Est.				8,000
	Less Preliminary Engr. Fee				-2,000
	Total Est. Cost of Construction				360,374
	Est. Construction Interest (9 Mon.) 5%				6,757
	Total Est. Balance Req'd for Construction - WATER				367,131

B. ESTIMATED OPERATION & MAINTENANCE - WATER

1.	Maintenance Man (Part Time)	Est.	3,500.00
2.	Electricity and Gasoline	Est.	1,000.00
3.	Administration, Audit, Billing etc.	Est.	2,000.00
	Total Estimated yearly O&M cost		6,500.00

C. ESTIMATED REPAYMENT - WATER SYSTEM

Assume no service connection charge

Assume a 30-year 5% bond issue

Repayment Factor = 65.06/$1,000 of Bond

Total Est. Balance Req'd for Construction	367,131.
Calculations: (Based on above assumptions)	
Annual amount to amortize bond (367.131x65.06)	23,885.54
Required reserve (10% of Annual Payment)	2,388.55
Est. Operations and Maintenance (Part B)	6,500.00
Total Est. Annual Revenue Req'd	32,774.09

300 services = 32,774/300x12	=	9.10/month/service
350 services = 32,774/350x12	=	7.80 " "
400 services = 32,774/400x12	=	6.83 " "

II. SEWER - ALTERNATE ONE

A. Engineer's Preliminary Cost Estimate - Alternate One

		Quan.	Unit	Unit Price	Amount
1.	8" Gravity Sewer Main	23,250	L.F.	4.50	104,625
2.	6" Force Sewer Main	4,600	L.F.	3.25	14,950
3.	4" Force Sewer Main	8,800	L.F.	2.00	17,600
4.	Add. for Rock Excavation for Pipe Line	3,000	L.F.	2.00	6,000
5.	Manholes	75	Ea.	350.00	26,250
6.	Lampholes	13	Ea.	150.00	1,950
7.	4" Clean Outs	15	Ea.	150.00	2,250
8.	Service Tees (Gravity)	220	Ea.	20.00	4,400
9.	Service Entrance (Force)	60	Ea.	50.00	3,000
10.	Lift Sta. w/standby power	1	Ea.	25,000.00	25,000
11.	Aerated Treatment Facility	1	Ea.	85,000.00	85,000
	Sub Total				291,025
	10% Contingencies				29,103
	Sub Total				320,128
	Legal (Est.)				9,604
	Engr. incl. Const. Inspection Costs (Est)				52,550
	Land & R/W (Est.)				3,000
	Less Prel. Engr. Fee				-3,500
	Environmental Impact Study (If req'd)				4,000
	Total Est. Cost of Construction				385,782
	Est. Construction Interest (9 months)				7,233
	Total Est. Bal. Req'd for Construction - SEWER ALTERNATE NO. ONE				393,015

B. **ESTIMATED OPERATIONS & MAINTENANCE - SEWER**

1.	Maintenance Man (Part Time)	$6,500.
2.	Electricity & Gasoline	1,000.
3.	Administration	2,000
	Total Estimated Yearly O&M Cost	$9,500

C. **ESTIMATED COST FOR "ELIGIBLE PORTION" OF PROJECT FOR EPA & STATE GRANTS - ALTERNATE NO. 1 - SEWER**

1.	All of Item 2 (Part A)	14,950.
2.	All of Item 10 (Part A)	25,000
3.	All of Item 11 (Part A)	85,000
4.	Land for Treatment Ponds	3,000
	Sub Total	127,950
	10% Contingencies	12,795
	Sub Total	140,745
	Legal (Est.)	4,222
	Engineering (Est.)	30,506
	Environmental Impact Study (If Req'd)	4,000
	Sub Total	179,473
	Est. Construction Interest (9 Months)	3,365
	Total Est. Cost of "Eligible Portion" (Alternate No. 1	$ 182,838

D. ESTIMATED REPAYMENT CALCULATIONS - ALT. NO. 1 - SEWER

Total Est. Funding Req'd - Alt. No. 1 - Sewer	$393,015.00
Less Possible Grant (90% of 182,838)	164,554.00
Est. Amt of Bond Issue	228,461.00
Assume a 30-year 5% Bond Issue	
Repayment Factor = 65.06/$1000 of Bond	
Annual Amount to Amortize Bonds = (228,461)(65.06)	14,863.67
Required Reserve (10% of Annual Payment)	1,486.37
Est. Operations & Maintenance (Part B)	9,500.00
Total Est. Annual Revenue Required - SEWER - ALT. NO. 1	25,850.04

Assuming 300 services:

25,850/300x12 = $7.18/mo/service

Assuming 350 services:

25,850/350x12 = $6.15/mo/service

Assuming 400 services:

25,850/400x12 = $5.39/mo/service

NOTE: While the sewer system is primarily designed on the basis of 400+ equivalent services, we would assume that the actual number of equivalent paying services would be somewhat less due to the variance in the type of service provided. The Board of Directors will need to provide an equitable formula to compensate for the different types of service. We can see no difficulty, however, in arriving with at least 300 equivalent paying services for both sewer and water projects. That is an equivalent to a normal household.

III. SEWER - ALTERNATE TWO

A. Engineer's Preliminary Cost Estimate - Alt. Two

1.	Alt. No. 1 Cost of Basic Items No. 1 thru No. 11	$291,025.
2.	Add for additional 6" force main (10,100-4,600) @ $3.25 per l.f.	17,875
3.	Add for additional horse power @ lift station	1,500
	Sub Total	310,400.
	10% Contingencies	31,040
	Sub Total	341,440
	Legal (Est.)	10,243
	Engr. incl. Inspection Costs (Est.)	53,700
	Land & R/W (Est.)	19,000
	Less Prel. Engr. Fee	-3,500
	Environmental Impact Study (If Req'd)	4,000
	Total Est. Cost of Construction	424,883
	Est. Construction Interest (9 Months)	7,967
	Total Est. Bal. Req'd for Construction - SEWER ALT. NO. 2	$432,850

B. ESTIMATED OPERATIONS AND MAINTENANCE

See Part B of Alternate No. 1	$9,500.

C. CALCULATIONS OF COST FOR "ELIGIBLE PORTION OF PROJECT" FOR EPA & STATE GRANTS - ALT. NO. TWO - SEWER

1.	Part C - Alt. No. 1, Items 1 thru 3	$124,950
2.	Land for Treatment Ponds	19,000
3.	All of Item 2, Part A, Alt. 2	17,875
4.	All of Item 3, Part A, Alt. 2	1,500
	Sub Total	$163,325
	10% Contingencies	16,333
	Sub Total	179,658
	Legal (Est.)	5,390
	Engineering (Est.)	31,735
	Environmental Impact Study (If Req'd)	4,000
	Sub Total	220,783
	Est. Construction Interest (9 Months)	4,140
	Total Est. Cost of "Eligible Portion" Alt. No. 2	224,923

D. ESTIMATED REPAYMENT CALCULATIONS - ALT. NO. 2 - SEWER

Total Est. Funding Req'd - Alt. No. 2 Sewer	432,850
Less Possible Grant (90% of 224,923)	202,431
Est. Amt of Bond Issue	230,419

Assume a 30-year 5% Bond Issue:

Repayment Factor = 65.06/$1000 of Bond

Annual Amount to Amortize Bonds (230.419)(65.06)	14,991.06
Req'd Reserve (10% of Annual Payment)	1,499.11
Est. Operations & Maintenance (Part B)	9,500.00
SEWER - ALT. NO. 2	25,990.17

D. <u>ESTIMATED REPAYMENT CALCULATIONS - ALT. NO. 2 - SEWER</u> - (Cont'd)

Assuming 300 services:

25,990/300x12 = $7.22/mon/service

Assuming 350 services:

25,990/350x12 = $6.19/mon/service

Assuming 400 services:

25,990/400x12 = $5.41/mon/service

NOTE: See note after Repayment Calculations on Estimate for Alternate No. 1

SECTION V

CONCLUSIONS AND RECOMMENDATIONS

I. CONCLUSIONS

The following conclusions have resulted from the studies made in the Bayview area relative to the possible installation of water and sewer facilities:

1. We believe that both water and sewer facilities are economically feasible considering the density of population and the number of transient tourist who use and enjoy the facilities at Bayview. Our impression would be at first that the sewer system is the most important. This is based on the fact that most people have fresh water supply although perhaps not adequate to the extent considered desirable for a modern standard of living. The installation of an adequate domestic water system would be, however, a relative simple project and while it would undoubtedly cost more than the people are presently paying for water service, it would still be less expensive then many of the new water systems being constructed in rural north Idaho. There is an excellent water aquifer for source, an elevated location for the storage tank and the amount of pipe line involved per customer is relatively small.

   The two most important problems that we see in a water system would be a certain amount of rock excavation along the northerly shore and the need for a dual pressure zone system due to the fact that the residences could vary in elevation too much to allow for a single zone to provide satisfactory service to all houses.

   We would anticipate some problem in selling a water project due to the fact that many of the people involved live in the area on a part-time basis and also that there are a large number of retired people in the area who are on fixed incomes and are naturally hesitant to increase their expenditures. On the other hand, the added protection from the standpoint of fire and also service interruptions would be a very desirable thing for the Bayview area. It is thought likely that the reduction in insurance rates to be realized may well offset a large part of the monthly cost of the proposed water system.

2. We have concluded from our studies that the installation of a sewer system is of vital importance to a continued use and enjoyment of the resorts and the area in general. The history of pollution in other lakes in north Idaho and, in fact, in some cases on Lake Pend Oreille itself, are indicative of the imperative need that control of sewage dumping be made a prime consideration in the planning and use of our resorts and retirement living areas.

   Bayview provides a number of difficulties in the collection and treatment of sewage primarily due to several natural problems which exist in the steep terrain and limited areas that we have for the installation of the system and, in particular, the treatment facilities. Of prime importance, of course, is the existence of large numbers of floating houses and the larger boats that are stored and/or based in the Bayview area. These problems can be solved, however, with proper design and sufficient funding and we feel that due to the density of the population in the area, the cost of installing sewer on this system will not be excessive, at least compared to other recent projects of this nature.

   As pointed out previously in this report, there will be a definite need for careful evaluation of the actual number of affected customers on the project and for an equitable method of assessing the users based, in part, upon the degree of service provided by the District's system and partly on the fact that the entire system must be paid for and must be operated on a year-around basis even though many of the users will be in the area only during a relatively short part of the year.

3. At this time the financing of domestic sewage or water systems is not clear cut. We do know that at the present time there are reported to be adequate loan funds available for the purchase or guarantee of bonds issued by the District. The question of grant funds, however, is presently indefinite. As stated before, at present the only agency with a program for supplying grant funds is the Environmental Protection Agency and their program is said to be somewhat under funded to meet the demands.

The environmental Protection Agency program is administered through the State of Idaho Environmental Protection Agency and does grant up to 75% of the cost of eligible portions of the project. The State also has a program whereby they can supplement the EPA grant up to an additional 25% of the cost. We would assume that inasmuch as these programs have been in a state of change for a number of years, that the best approach is to make application to the proper agencies and learn just what might be available for the Bayview systems.

II. RECOMMENDATIONS

The following recommendations are made to the Board of Directors with respect to further progress on the proposed projects.

1. We feel that it is important that the District determine as quickly as possible the feeling of the people with regards to the proposed water and sewer projects. At the Board's discretion relative to the timing, we would recommend that a public meeting be called at which time the findings of the Engineer's report be explained and that at least unofficial indication requested from the residents of the District as to their desire regarding the continuation of the proposed project.

2. We would recommend that the Board of Directors make formal application to the Farmers Home Administration and to the State of Idaho Environmental Protection Agency for the necessary funding and grants to build the projects. We consider it very important that the District establish at least a priority rating even though actual funding may be a year or so in the future. In addition, we recommend that an application be submitted to the State Fish and Game Department for the use of a portion of the property west of Bayview for treatment site. We further recommend that the District pursue the obtaining of options for the location of a water storage tank, the proposed location of a well and the location of the sewer pumping station all as indicated in the Preliminary Report.

Upon receiving favorable indications from the residents of the District to proceed with the project and after approval of the preliminary work by the State Department of Environmental Protection, and their tentative obligation of funds to the project, the Engineers should then be advised by letter to proceed with the final planning, design and specifications for the work.

3. We would recommend at this point in the procedure that the attorney prepare a bond election transcript and that the residents of the District then be requested to vote the necessary bonding authority to proceed with the project.

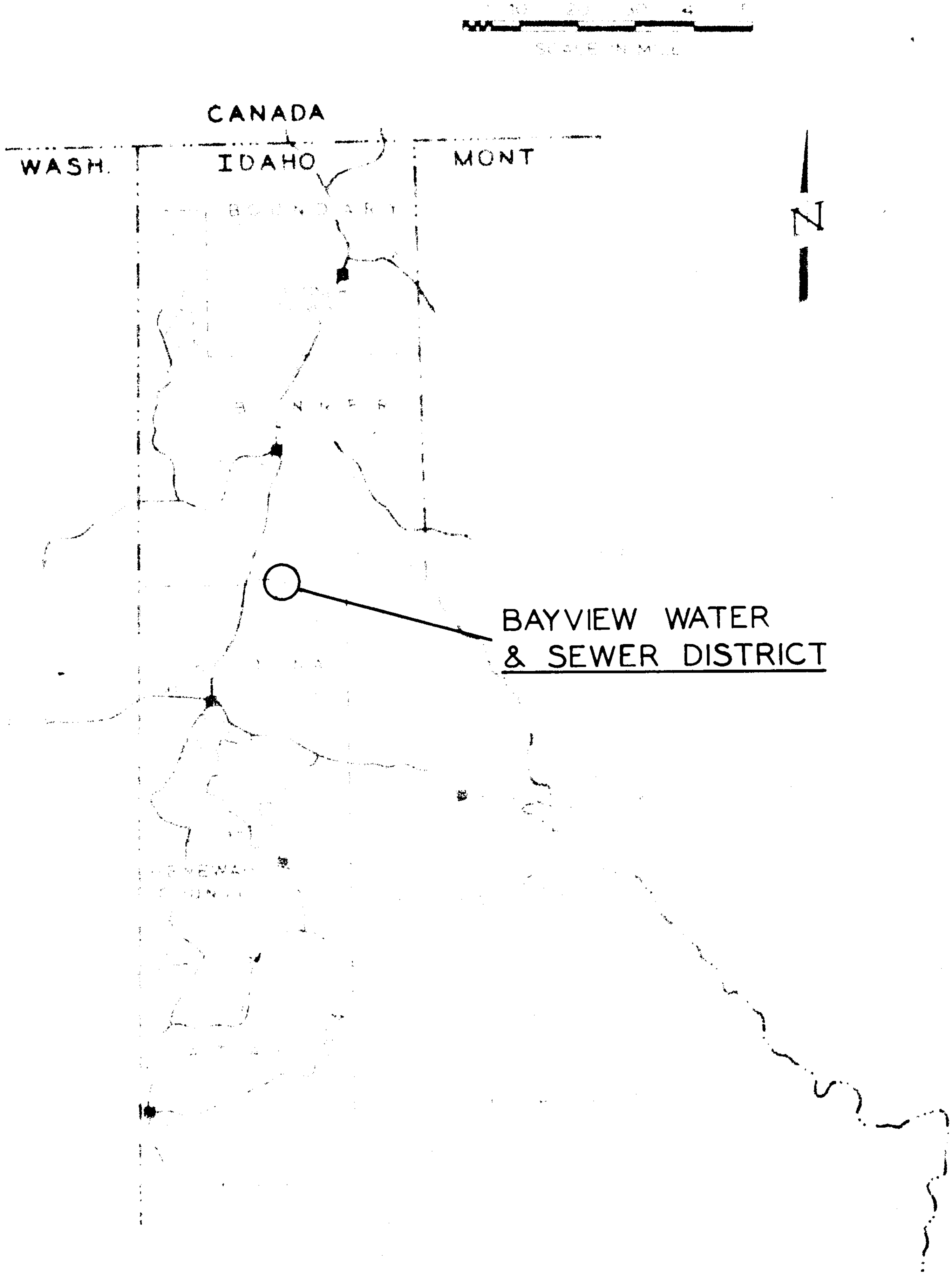
4. We consider of utmost importance to the success of any water and sewer project that the Board of Directors make every reasonable effort to advise all residents of the area of the status and the findings of the projects as they progress toward the construction stage. We find one of the biggest difficulties to be faced by the Directors is the squelching of unfounded rumors often started with the intent of confusing the issue by a dissident individual and we find that these members are often believed and are able to create considerable bad feeling and problems for the District. For this reason, we would recommend that news releases be issued,as well as whatever public meetings are required be held, at intervals sufficient to keep the people informed. We believe that particular emphasis should be placed on the fact that the project does belong to the people, to be for the benefit of the people and that no effort is being made to ram something down the throats of individuals by a few people who would supposedly have much to gain by the proposed installations.

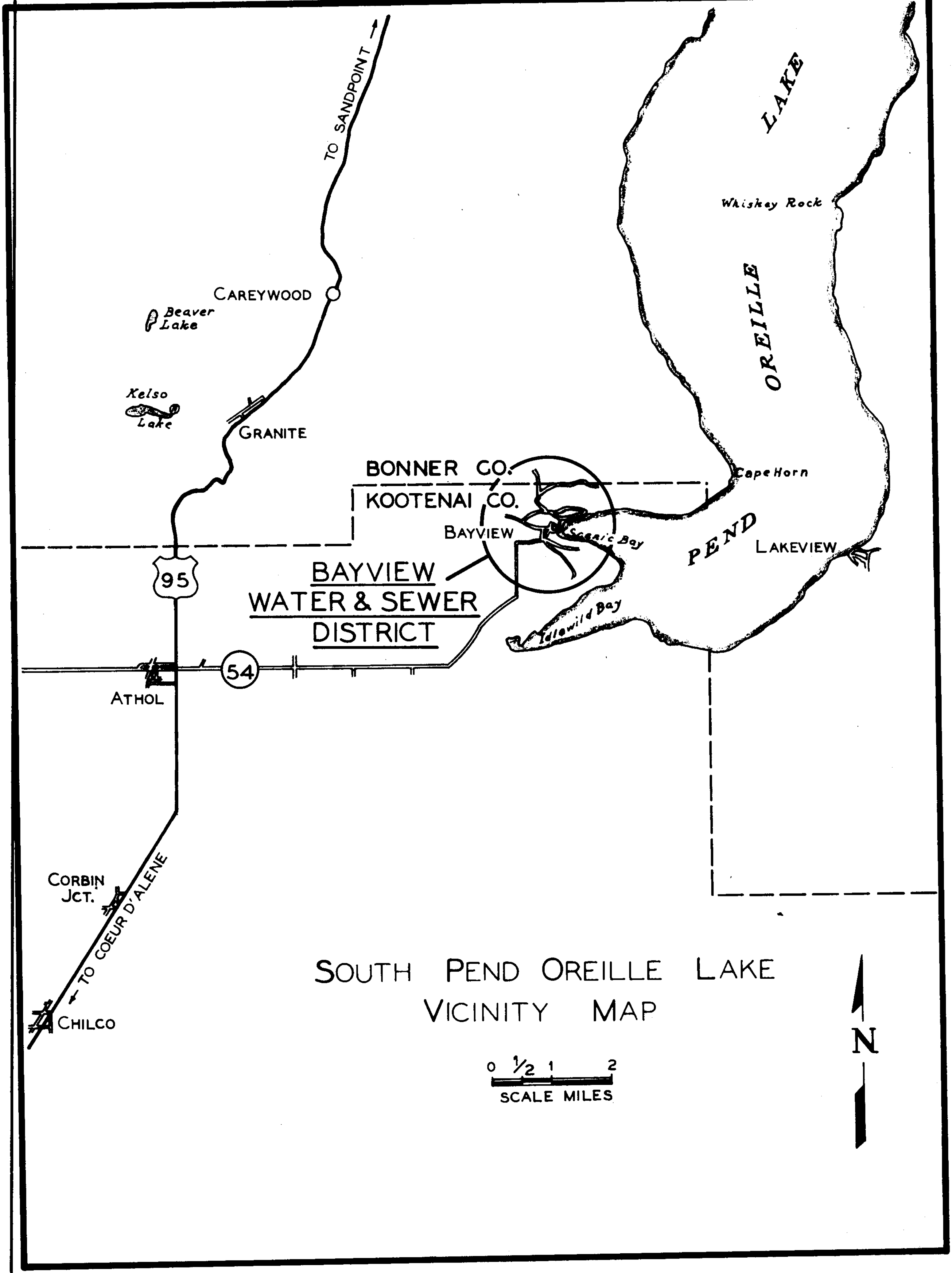
We hereby offer our assistance in any way possible to help the Board of Directors in providing the necessary information and in carrying the paperwork and details necessary for this project to a satisfactory conclusion. We wish to thank the Board and others in the District who have been helpful in the gathering of information for these studies documented herein.

Very truly yours,

K. A. DURTSCHI, P. E.

PROJECT LOCATION MAP




TO SANDPOINT
LAKE
Whiskey Rock
OREILLE
CAREYWOOD
Beaver Lake
Kelso Lake
GRANITE
BONNER CO.
KOOTENAI CO.
Cape Horn
BAYVIEW
Scenic Bay
PEND
LAKEVIEW
95
BAYVIEW WATER & SEWER DISTRICT
Idlewild Bay
54
ATHOL
CORBIN JCT.
TO COEUR D'ALENE
CHILCO
SOUTH PEND OREILLE LAKE
VICINITY MAP
0 1/2 1 2
SCALE MILES
N

IS & RB 25-1

Exhibit A

WILLIAM S. HAYES
MANAGER

GLENN SMITH
ASSISTANT MANAGER

IDAHO
SURVEYING AND RATING
BUREAU, INC.

BOISE, IDAHO

1007 W. JEFFERSON
P.O. BOX 1069
83701

TELEPHONE 343-5483
AREA CODE 208

April 5, 1973

K. A. Durtschi & Associates
1025 Coeur d'Alene Avenue
Coeur d'Alene, Idaho 83814

Dear Mr. Durtschi:

Your letter of April 2 regarding the water system in Bayview is hereby acknowledged. We inspected these facilities in 1966 and at that time the old municipal water system had deteriorated and was no longer in use. Instead of this system, there were three privately owned systems which were designed only for domestic water, for the major portion of the townsite. The underground piping in all of these systems was 2½-inch or less and there were a few 2-inch standpipes scattered about the town.

Since our standards call for a minimum water supply of at least 250 g.p.m., for a two hour period, before credit can be allowed, we were unable to consider this in the fire insurance rates. Your proposed system of a minimum of 200,000 gallons storage and at least 6-inch mains would be very acceptable to us. Naturally, we are assuming the fire hydrants which you mentioned would be standard. With this sort of a system, credit would be allowed in the fire insurance rates but the amount of this credit could be determined only upon inspection of the facilities.

Normally speaking we would not allow credit for a government owned fire truck such as is available in the Navy Installation; however, if we could have some definite assurance that this truck would be available on a permanent basis, possibly some credit could be allowed for that.

At the present time I plan on being in your area sometime within the next few weeks and if you feel a meeting would be in order, I will give you the dates I will be there when it is definitely determined.

Very truly yours,

Karl K. Goble

Karl K. Goble
Chief Engineer

KKG:smw

Exhibit A

JOSEPH C. GREENLEY
Director

IDAHO FISH AND GAME DEPARTMENT

POST OFFICE BOX 25
600 SOUTH WALNUT STREET
BOISE, IDAHO 83707

April 9, 1973

K. A. Durtschi & Associates
1025 Coeur d'Alene Avenue
Coeur d'Alene, Idaho 83814

Dear Mr. Durtschi:

In reply to your letter dated March 16, 1973, regarding the Bayview Water and Sewer District, Project 163-72, we are of the opinion that we cannot legally grant the City of Bayview an easement or sell them the property needed for the facility in question.

The land was given to the Idaho Fish and Game Department under a conditional deed from the Federal Government which states that the area is to be solely used for wildlife management purposes. Thus, the Department would be in violation of the deed if we granted a change in land use.

If we can be of further assistance, please contact Mr. Dale VonSteen, Regional Wildlife Land Manager, at our Coeur d'Alene office.

Sincerely,

IDAHO FISH AND GAME DEPARTMENT

Robert L. Salter
for Joseph C. Greenley
Director

cc: Von Steen
State Parks and Recreation Department

B-2

MAY 1 6 1977

BAYVIEW WATER & SEWER DISTRICT
PROPOSED DOMESTIC WATER SYSTEM
USING
EXISTING NAVY OWNED
SYSTEM FOR WATER SOURCE

May 10, 1977

K.A. [illegible] & ASSOCIATES
ENGINEERING & SURVEYING
[illegible]
COEUR D'ALENE, IDAHO [illegible]

BAYVIEW WATER & SEWER DISTRICT

PROPOSED DOMESTIC WATER SYSTEM
USING
EXISTING NAVY OWNED
SYSTEM FOR WATER SOURCE

May 10, 1977

[redacted] PLANS & SPECIFICATIONS
REVIEW

By: Gary T. Stevens
Environmental Engineer

These plans and/or specifications have been reviewed for compliance with Idaho Dept. of Health and Welfare regulations. This review does not relieve the owner, engineer, or the contractor of the responsibility to design or construct these facilities in compliance with all current applicable federal, state and local laws, rules, regulations, or ordinances.

Date: 6/2/77

Plans and/or specifications must be resubmitted for review if construction is not initiated on or before: Preliminary Report

Refer to letter of 6/3/77 to F. Russell

Bayview Water &
Sewer District
May 10, 1977

A. GENERAL INFORMATION

This will be a brief report supplementing previous studies made including the Preliminary Engineering Report dated April 1, 1974, for the Bayview Water and Sewer District and a second report dated September 20, 1976, for the North Bayview Water Association. In general, it covers a new proposal for the installation of a domestic water system using as a water source the existing water facilities presently owned and operated by the Naval installation which lies within the boundaries of this District.

In 1972 the Bayview Water and Sewer District was organized. A Preliminary Engineering Study was made and a bond election was held for the purpose of approving general obligation bonds to construct domestic water and sewage facilities. The bond was voted down by the people in the District. It is generally believed that,while there was adequate public support for the sewage collection and treatment, due to the fact that there are a number (approximately seven) small water associations within the District that the water portion of the original proposal did not receive favorable consideration. Thereby resulting in the defeat of the proposal.

The water and sewer district consists basically of the unincorporated town of Bayview lying generally on the west end of Scenic Bay and lakeshore development along both the south and north edges of the Bay. See the enclosed map. In most cases these associations, as mentioned previously, are served by relatively shallow drilled wells most of which cannot be approved by the Health Department due to the fact that the population density is very high and the lack of sewage collection in the area would indicate a high possibility of contamination of the acquifer from which these wells draw their water.

The people living along the south shore of the bay, mostly summer homes and resort facilities, draw water either from individual wells or directly from the Lake. Their water source is also considered to be marginal as far as public health standards are concerned. The residents along the north edge of the Bay are the worst off for water supply inasmuch as wells do not produce in this rocky clay area. A number of the homes in this area are served by small springs which are marginal under normal circumstances and are considered very likely to be inadequate during the periods of drought and low rain fall such as being presently experienced. The rest of the north shore homes either haul water or pump from the Lake.

After the failure of the original bond issue, a group of the residents along the north shore formed a tentative water association for the purpose of constructing a water system to serve that particular area. The Preliminary Engineering Report mentioned above was completed and the Association has been working on the problem of membership and financing.

This group has run into considerable difficulty due to legal technicalities with regard to forming a L.I.D. which covers only a portion of the area served. Apparently such an arrangement is not acceptable.

Recent regulations of the Farmers Home Administration make the obtaining of a loan to the Association difficult, if not impossible. To this date we have been unable to determine a route for financing the project that would be both legal and acceptable to the funding agencies.

We refer the reader to the two previous reports for more detailed information on the District.

Recently it has come to the Attention of the Board of Directors of the Water and Sewer District that there is a good possibility that the District could obtain from the United States Navy their existing water system which includes a deep well and pumping equipment, storage tank and certain distribution mains. This system presently serves the navy installation in Bayview consisting primarily of four residences and a navy experimental facility.

The system appears on the surface to be an adequate source of supply for the Bayview area and it is believed would be an excellent approach to the problems of obtaining domestic water for the District.

The following data and preliminary estimates are based upon the assumption that the navy system is available and that the District will proceed with a water distribution system to serve the entire district, at least to those residents who want the service.

B. ASSUMPTIONS

1. We are assuming that the Water and Sewer District will now vote favorably on the proposal to construct a domestic water system capable of serving the district using the existing navy facilities for water source and storage. We anticipate that there will be some people presently served by the small systems in Bayview which will not want to be served by the new system. For this reason, it was necessary to survey the area to determine the locations where water lines would be needed.

2. It is assumed that the system owned by the Navy will be adequate for the entire district and that it will be made available to the District at no monetary cost. We assume that the Navy will provide a letter of conditions which must be met by the District to qualify for the transfer of the navy system. We are also assuming that the navy installation will then become paying customers to the water and sewer district.

3. We assume that there will be additional development of the area and that the number of customers will increase up to double or more the initial hookups.

4. We assume that the District will serve the resorts, trailer courts, motels, etc., by providing one metered service to each commercial establishment and that the owner will then provide the necessary facilities to distribute the water within his own property complex. The Board of Directors will determine the number of equivalent services each such commercial development will pay for.

5. Cost estimates are based upon assumption that the District will borrow the funds required from the Farmers Home Administration by the issue of a revenue bond for the full cost of the project less the original connection fees which have been tentatively set at $250,00 for individual services and $500,00 for commercial services. It is assumed that connection fees will increase substantially once the project is in service.

6. Mr. Richard Hansen who owns considerable undeveloped property on the North side of the project has indicated a desire to purchase 40 or more services to take care of his proposed subdivisions. We have assumed that he will purchase these services during the initial installation. Actual service of his property will require installation by the owner of service mains and an additional storage tank to serve his property which lays too high in elevation to be served by the pressures within the main service area.

7. It is assumed that the water source will be acceptable to the Health officials without treatment or chlorination. This has been the practice in the past.

C. DESCRIPTION OF THE EXISTING NAVY WATER SYSTEM

The existing navy domestic water system consists of equipment originally constructed during the World War II but which has since been overhauled and kept in relatively good condition. According to naval sources, the well is a 14" diameter, 330-foot deep-drilled well located approximately 1/4 mile to the southwest of the District and is known as Pump House No. 7. See Plan for location. Facilities within the 14' x 20' concrete pump house, includes a Peerless oil lubricated deep-well turbine pump with a 125 h.p., 440-volt, 3-phase electric motor. There is also a standby diesel power unit and the necessary gear driven head for emergency operations in the event of electric power failure. This power unit must be connected to the pump and operated manually. The pump controls include check valve surge chamber and a pressure sensing device for shut off on pre-set pressures indicating the tank level. The unit is presently activated by a timer set to operate approximately twice weekly and is then shut off by pressure when the tank is full. The pump on this unit was removed and overhauled by Dickerson Pump and Irrigation in 1959. To the best knowledge of the naval personnel and from all appearances, this equipment is in good condition, even though it has been in service for some time.

Naval personnel indicate that the pump produces approximately 750 g.p.m. at full tank heads. There is also an old chlorinator unit within the building which has not been used in recent years due to the fact that the water has not required treatment.

The storage on this project consists of a 225,000 gallon reinforced concrete standpipe located as shown on the Plans. This tank is reported to be in good condition. It was very recently cleaned and epoxy coated on the inside and the Navy indicates that they are planning to replace the existing asphalt coated timber roof and are also contemplating completion of painting of the outside probably in the coming summer.

Water mains include a 12" cast iron main between the pump house and the tank and an 8" cast iron main leading from the 12" transmission main down to the naval unit. Due to the elevation differences between the storage tank and the lakeshore there is an 8" pressure reduce located part way down the hill in a concrete and frame enclosure.

The condition of the pipelines appears to be excellent for their age. There was a recent repair where a section of 10" cast iron pipe had split, probably many years ago during construction and the pipe taken out showed no signs of deterioration from electrolsis or tuberculation. The line is of the leaded joint type and there may be some minor leaks within the system. However, the amount of pumping by the Navy does not indicate any major leakage problems. In general, it would appear that this system would be adequate to serve the proposed District's facilities.

Bayview Water &
Sewer District
May 10, 1977

D. PROPOSED PROJECT CRITERIA

1. Estimates of initial service density and locations are based upon a survey conducted by the Directors of the District. The following is a recap of the equivalent service loading to be anticipated:

Private dwelling & lots to be served	111	services	
Hudson Bay Resort	15	equiv.	Services
Boileau's Resort	15	"	"
Wheel Inn	2	"	"
John's Landing	3	"	"
Scenic Bay Resort	15	"	"
J.D.'s	3	"	"
Motel	3	"	"
Trailer Court	5	"	"
Watergate	2	"	"
Bocks Truck's (Proposed trailer park)	5	"	"
Hansen Beach	2	"	"
Hansen Subdivision (Proposed)	40	"	"
Total Est. Services (Equivalent)	221		

NOTE: The above breakdown is tentative only and will, of necessity, be modified as required by the District to assure fair distribution of their obligations.

Due to the complexity of the area, which includes many types of residential facilities, the determination of actual charges for water service will require a careful analysis of each commercial unit to determine the applicable service rate for each establishment.

D. PROPOSED PROJECT CRITERIA (Cont'd)

2. Water mains will be established to provide a 6" or larger main to serve fire hydrants located within a 500' radius of all served properties. Mains will be P.V.C. plastic, gasket joint pipe of adequate design for the pressures and volume of water required.

3. Distribution mains will provide capacity for the anticipated load including future expansion for 1,000 gallons per day average demand and at pressures adequate to operate modern household equipment. The services will be metered and billing will be based upon a flat fee for a basic quantity of water plus extra charge for use of water above the basic allowance.

4. A pneumatic pressure station capable of increasing the pressure to serve the higher elevations along the north side of the District will provide for up to 100 g.p.m. to serve the Hansen property and several houses already in existence in this area.

Bayview Water & Sewer District
May 10, 1977

E. PRELIMINARY ENGINEERING COST ESTIMATE
BAYVIEW WATER SYSTEM

8"	Water Main	2,600	L.F.	5.86	15,210
6"	" "	13,950	L.F.	4.50	62,775
4"	" "	11,150	L.F.	3.00	33,450
8"	Gate Valves	1	Ea.	300.00	300
6"	Gate Valves	17	Ea.	250.00	4,250
4"	Gate Valves	17	Ea.	225.00	3,825
1"	Air Relief Valves	4	Ea.	150.00	600
3/4"	Water Service	107	Ea.	225.00	24,075
1"	Water Service	5	Ea.	250.00	1,250
1½"	Water Service	13	Ea.	275.00	3,575
	Fire Hydrant w/valve	19	Ea.	850.00	16,150
	Booster Station	1	L.S.	8,000.00	8,000
	Subtotal				173,460
	10% Contingencies				17,346
	Subtotal				190,806
	Legal (3%)				5,724
	Engineering incl. Inspection 15%				28,620
	Total Est. Cost of Construction				225,150

F. OPERATIONS AND MAINTENANCE COSTS

The following are estimated cost of operations for the proposed water system:

1.	Electric Power	$2,000.00	per year
2.	Mtceman labor 1 man 1 day/week	2,000.00	" "
3.	Clerical	1,200.00	" "
4.	Mtce Repair & Supplies	2,500.00	" "
	Total Est. O&M	$7,700.00	per year

G. REPAYMENT

Assume initial connection fees:

Private 111 @ 250	27,750	
Commercial 11 @ 500	5,500	
Hansen 40 @ 250	10,000	
Total	$43,250	
Total Est. Construction Cost		$225,150
Less Connection Costs		-43,250
Funding Required		$181,900
Construction interest 6 months @ 5%		4,548 est.
Total Bonding Required		$186,448 (Say 190,000)

Repayment of Bonds @ $65.06/yr/1000

Repayment = 190 x 65.05	$12,361.40
10% Reserve req'd by FHA	1,236.14
Est. O&M	7,700.00
Total Revenue Required	$21,297.54

Assuming 221 Equiv. Services 21,297.54/221 = $96.36/yr/serv = $8.00/mo/service

H. FINANCING, PAYMENT AND BONDING

It is anticipated that the proposal submitted with this report will solve the problems previously mentioned of financing. The Farmers Home Administration has indicated that there are funds available at this time for water and sewer districts. The normal procedure is through a bond issue by the District, which, if not marketable on the open market, would be purchased by the Farmers Home Administration based on a 5% interest, 30-year bonds.

Recent legislation in the State of Idaho has created regulations allowing bonding by a water and sewer district by the use of revenue bonds. This has made the problem of bonding easier for rural districts, in that, first, it requires only a majority affirmative vote for passage and, secondly, it is based on repayment through revenues of the users of the facilities. This means that only those people using the water would be obligated on the bond. It does, however, give the District the ability to collect delinquent water fees through taxes without obligating the properties in the District which are not benefitting from the water system.

The possibility exists that there could be some help available in the form of grants from one of several government agencies including the Farmers Home Administration (FmHA), Housing and Urban Development Agency (HUD) or the Economic Development Agency (EDA). As these funds depend upon many variables, it is not possible to predict what, if any, grant help might be available at any given time and condition.

I. RECOMMENDATIONS

1. It is recommended that the Board of Directors of this District pass a resolution to request of the U. S. Government that the navy installation be turned over to the District.

2. It is recommended that the District make immediate application to the Farmers Home Administration for commitment of $190,000 of loan funds to be used for the construction of the proposed distribution system.

3. We recommend that the District hold a bond election requesting approval to issue $190,000 or such other amount as may be determined in revenue bonds. Noting that it will be very important that all people within the District be thoroughly informed as to exactly what the proposal is and as to their obligations. Particularly those people who will not be served should be educated to the fact that the bond issue will not obligate them.

4. If and when the bond election passes, the Engineer should be advised to proceed with the final design and the letting of contracts for construction.

THIS PAGE WAS INTENTIONALLY LEFT BLANK

TECHNICAL MEMORANDUM No. 2

J·U·B ENGINEERS, INC.

Bayview Water and Sewer District
Water System Facility Plan

Existing Conditions

PROFESSIONAL ENGINEER
REGISTERED
7768
2.24.20
STATE OF IDAHO
STEPHEN P. JAMES

February 2020

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Contents

Figures

Tables

Appendices

TM No. 2 – Existing Conditions

2.1 Study Boundary

The Bayview Water and Sewer District's (District's) water service boundary comprises the general planning area of any improvements to the District's potable water system. The overall District boundary, wells, storage tank locations, and other facilities are shown in **Figure 2-1.** The District boundary encompasses approximately 870 acres surrounding Scenic Bay of Lake Pend Oreille and is bounded by Farragut State Park on the south and west.

2.2 Technical Memorandum Organization

This technical memorandum is comprised of sections detailing the planning area, population demographics, water use, and regulatory issues for the District's existing water system, summarized as follows:

Section 2.3 – Service Population

The current population served by the District's water system, including number of connections and equivalent residential units (ERUs) is discussed. Two methods for projecting future connections and ERUs are presented and a growth rate is selected for use in determining future demands.

Section 2.4 – Water Use

Production data for 2015 through 2017, including Average Day, Maximum Day, Peak Hour, and Maximum Month, is presented. Consumption (demand) data collected from individual water meter readings is also summarized. Future production requirements based on projected future connections are discussed, along with fire flow recommendations. Finally, production and consumption data are compared to determine non-revenue water, the difference between water produced and water sold.

Section 2.5 – Existing Water System

The current operations, performance, and observed deficiencies of the components of the District's water system (i.e. Supply, Storage, and Distribution) are discussed to establish a baseline condition for the system. The existing water rate structure is presented and recommendations from recent IDEQ Sanitary Surveys are summarized.

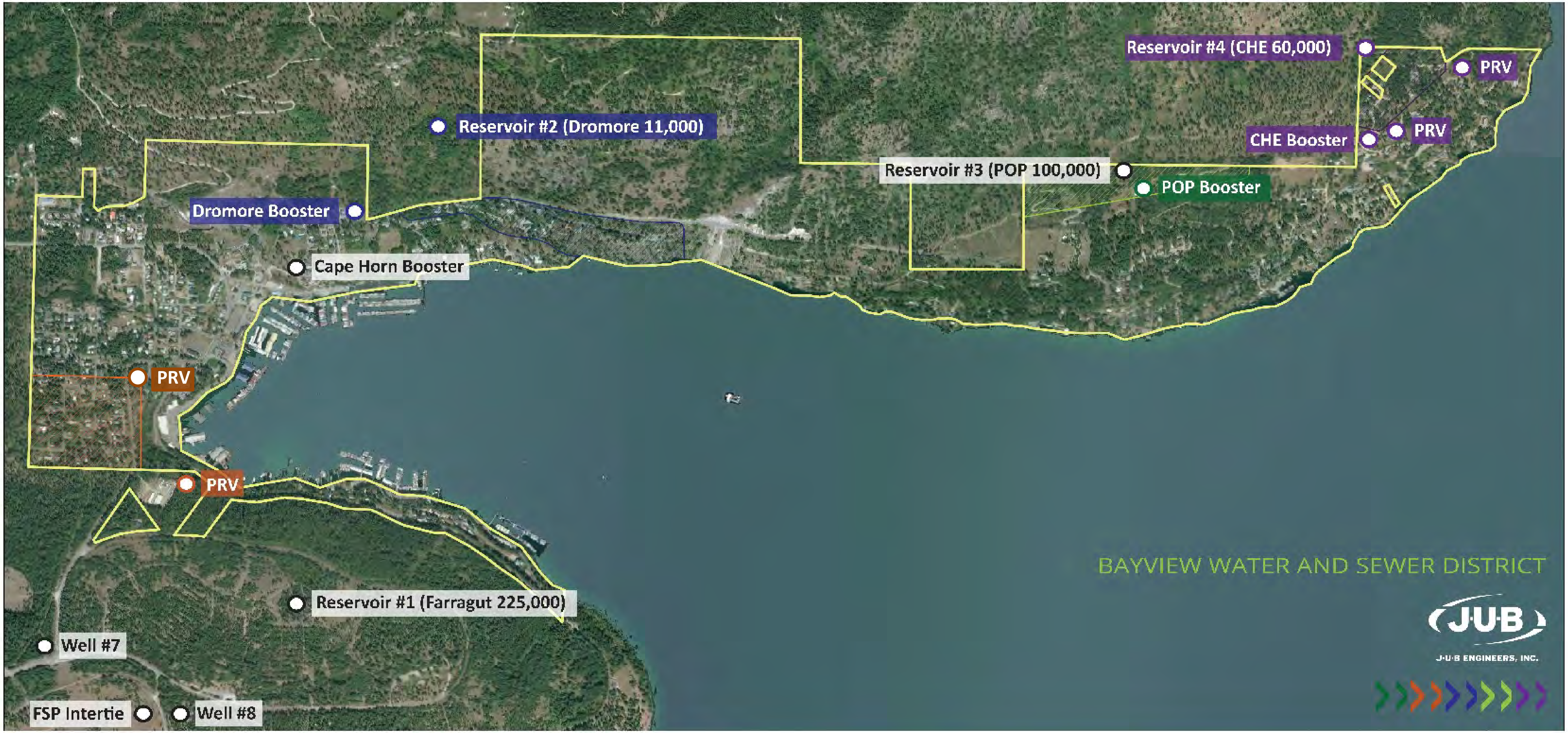
Section 2.6 – Regulatory Considerations

This section presents current regulatory items pertinent to the District's water system, as well as future regulations that may impact the District within the planning period.

Existing Environmental Conditions in the Planning Area

Note that the existing environmental conditions for the planning area for the improvements to the District's potable water system are presented and discussed separately in Technical Memorandum 5.

Figure 2-1 – District Extents and Water System Service Area



2.3 Service Population

2.3.1 Current Population Served

Population data from the 2010 Census and US Census Bureau population estimates for the nearby communities of Athol, Spirit Lake, Sandpoint, the 83803 ZIP code, as well as Kootenai and Bonner County is presented in **Table 2-1**. The table also shows percent change per year from 2010 through 2016. In general, population in all surrounding areas has increased in all referenced areas since 2010.

Table 2-1 – Existing Population Data

Entity	2010 Census[(a)]	2016 Population Estimate[(a)]	Percentage Change	Percent Change per Year from 2010 to 2016
83803 ZIP Code	744	984	12.63%	2.11%
Athol	692	863	24.71%	4.12%
Spirit Lake	1,945	2,269	16.66%	2.78%
Sandpoint	7,365	7,698	4.52%	0.75%
Kootenai County	138,494	147,716	6.66%	1.11%
Bonner County	40,877	41,389	1.25%	0.21%

(a) *Per the U.S. Census Bureau*

The exact population served by the District is difficult to determine as the service area is unincorporated and official population numbers are not available. Additionally, the District experiences seasonal population fluctuations as many homes in its service area are vacation and/or second homes. Therefore, population served by the District's water system was estimated using existing 2010 Census data plus residential connection information from the District assuming 1.91 people per household (the average density listed in the 2010 Census for area encompassed by the 83803 ZIP code). It should be noted that the community of Bayview and the Cape Horn Area are the only densely populated areas of the 83803 ZIP code. Using this approach, the total population served by the District's water system is estimated at **984** people (i.e., 463 active residential connections with 1.91 people per household, plus approximately 100 employees at the U.S. Naval Detachment). Note that the U.S. Naval Detachment is a research facility of the U.S. Navy that conducts acoustic research in Lake Pend Oreille.

2.3.2 Connections and ERUs

The District maintains records on its total number of connections. The District is currently reviewing their commercial connections. Currently the District considers 12 of the connections to be commercial, but a recent review of the records for this facility planning effort by the District has indicated several connections that are currently labelled residential should actually be considered and billed with the commercial connections. The District has not assigned "equivalent residential units" or ERUs to their commercial connections at this time but anticipate analyzing it in the upcoming rate study. **Table 2-2** contains connection information for the District for 2014 through 2017, including percent change.

Table 2-2 – Total Water Connections (Active Plus Inactive) [(a)]

Date	Residential Connections		Commercial Connections	Total Connections	Annual Change	
	Bayview Area	Cape Horn Area			Connections	Percent
Sept 2014	345	149	12	506		
Sept 2015	345	150	12	507	1	0.20%
Sept 2016	348	150	12	510	3	0.59%
Sept 2017	352	156	12	520	10	1.96%
				AVERAGE	4.67	0.92%

(a) *Includes active and inactive accounts – best available information provided by the District's records.*

2.3.3 Future Connection Projections

Residential connections have increased at a rate of approximately one percent from 2014 through 2017 while commercial connections have remained constant. This correlates relatively well with the 1.11 percent growth observed in Kootenai County from 2010 through 2016. **Table 2-3** shows projected connections through a 30-year planning period assuming commercial use and demand remain relatively constant and a one percent growth rate for residential connections. Extending the horizon 10 years beyond the typical 20-year planning period can be instructive for long-lived infrastructure improvement planning.

Table 2-3 – Future Active Connections at a One Percent Growth Rate

Year	Residential Connections	Total Connections [(a)]
2017 (Existing)	463	475
2027	509	521
2037	560	572
2047	616	628

(a) *Assumes commercial connections remain at existing levels (i.e., 12)*

This projection (i.e., one percent growth), which results in the addition of 97 and 153 connections over the next 20 and 30 years, respectively, assumes the District water system boundaries will remain close to the current configuration and all new connections are expected to be residential. Some minor commercial expansion may occur, but future use and demand are not expected to be significantly different from current uses.

Another method for approximating the District's future connections is based on land availability and number of platted lots in the District plus all parcels large enough to be subdivided. This assumes the water system would expand to serve all areas, including existing water patrons and sewer-only lots. In addition, there are at least four small private water systems in the Bayview area (and within the current District boundaries) that do not currently have any desire to be served by the District's infrastructure.

However, future costly repairs or regulations may increase the probability that these four small systems (Schaeffer, Bayview Heights, Silver Water, and McKinley) would connect to the District's system. This could represent 60-80 potential residential connections in the Bayview Area.

A potential full build-out scenario could result in new water service to approximately 130 connections in the Cape Horn Area and potentially 200 connections in the Bayview Area. This results in a total of 330 new residential connections and represents a growth rate of around two percent annually over the next 30 years. This also correlates well with the growth seen in the 83803 ZIP code area based on US Census Bureau projections. As indicated earlier, the District boundary makes up the bulk of the 83803 ZIP code area.

Based on the historical data presented, the District selected a residential growth rate of two percent for planning purposes at a Public Workshop on April 10, 2018 after reviewing the range of potential growth over the 20-year planning period for this Facility Plan. Future commercial demand was assumed to remain similar to the current uses. A two percent growth rate results in approximately 679 connections served by the system in 2037, as shown in **Table 2-4**.

Table 2-4 – Future Active Connections at Selected Two Percent Growth Rate

Year	Residential Connections	Total Connections[a]
2017 (Existing)	463	475
2027	556	568
2037	667	679
2047	800	812

[a] *Assumes commercial connections remain at existing levels (i.e., 12)*

2.4 Water Use

Subsequent sections discuss the District's water production, current and future demand, fire flow, and non-revenue water.

2.4.1 Production

The District's water supply consists of two groundwater wells that each have a capacity of 750 gpm (Well 7 primary, Well 8 backup). Historically, Well 7, currently leased by the District from the U.S. Navy, has been the District's primary source. Well 8 is considered the backup and is leased from the State of Idaho.

The production from each well is measured with a flow meter located in each well house. The District's operator typically reads the flow meter once daily. Prior to 2016, some of the production data appears to be missing, inaccurate and/or affected by the 2015 wildland fire in the District. In addition, as noted in later sections, non-revenue water has been reduced from previous years due to the fixing of leaks by the former system operators. While additional years of data are presented here for review, analysis of the production output for future projections will be primarily based on data from 2016 and 2017. **Table 2-5** summarizes the monthly production data.

Table 2-5 – Monthly Water Production Data (2014 – 2017)

Month	Total (gal)				Average Day (gpd)	Maximum Day (gpd)
	2014	2015[(a)]	2016	2017	2016 & 2017	2017
January	9,215,900	7,201,900	7,414,700	5,515,300	208,600	
February	8,784,400	6,967,000	7,634,400	4,786,800	221,900	
March	7,951,500	7,879,200	8,042,600	5,173,200	213,200	
April	7,282,300	7,703,700	8,238,400	4,471,000	211,800	
May	8,156,500	9,206,800	10,466,500	5,805,400	262,500	
June	9,421,700	13,432,000	11,655,000	7,223,500	314,700	
July	11,840,100	18,112,600[(a)]	10,154,000	10,566,100	334,200	392,900
August	10,811,000	14,075,000	10,406,400	11,418,800	352,000	477,100
September	10,010,800	9,839,600	7,026,800	6,614,300	227,400	
October	7,585,100	8,247,300	4,823,600	4,549,700	151,200	
November	6,069,300	8,221,000	4,341,800	3,910,400	137,500	
December	8,656,900	7,330,800	5,922,400	4,444,800	167,200	
Totals:	105,785,500	118,216,900	96,126,600	74,479,300	233,500[(b)]	

(a) *In 2015, the Cape Horn Area and portions of Bayview experienced a significant wildland fire during the month of July that destroyed several homes and structures within the District boundary. This resulted in higher than normal water use in the District for fire suppression.*

(b) *Average value.*

The District's production typically experiences a pronounced increase generally beginning in June due to increased irrigation demands and the seasonal influx of tourists and part-time residents. The highest production occurs in the summer (i.e., June through August), with substantial increases in July and August. Production then drops significantly from August to September with subsequent decreases to the winter months. This pattern is consistent with the highly seasonal population and irrigation demands throughout the District.

The total monthly production during the summer months of 2015 was abnormally high. This can be attributed to an early and very dry summer and to the significant wildland fires in and adjacent to the District during that year that taxed the water system.

Production in 2016 was still higher than what was seen in 2017. Both years did not experience the drought conditions of 2015 and likely represent more typical production years for the District than 2015. 2017 data is generally believed to have the lowest system leaks, but for the purposes of this analysis, 2016 and 2017 will be averaged together.

Table 2-6 summarizes daily and monthly average and maximum flows, including peaking factors. Peak hour production cannot be identified because the District does not collect hourly flow data. Therefore, a peak hour production value was estimated at 160 percent of maximum day production based on available diurnal information from nearby water systems. Although the diurnal is based on larger water systems, it is assumed to be representative of the District for planning purposes.

Through 2016 and 2017, the District's water production averaged approximately 233,500 gallons per day (gpd) with a peak daily production of 477,100 gallons recorded on August 1, 2017. Maximum monthly production was highest in June 2016, although similar production was recorded in August 2017, per **Table 2-5**.

Table 2-6 – Daily Average, Monthly Average, and Maximum Production (a)

Parameter	Production	Per Connection (b)
Average Day Production		
Annual (c)	233,500 gpd (162 gpm)	492 gpd
Summer (d)	333,600 gpd (232 gpm)	702 gpd
Maximum Day Production (e)	477,100 gpd (331 gpm)	1,004 gpd
Peaking Factor (e)	2.04	-
Peak Hour Production (f)	763,400 gpd (530 gpm)	1,607 gpd
Peaking Factor (g)	3.27	-
Average Month Production (gallons per month)	7,108,600	15,000
Maximum Month Production (h) (gallons per month)	11,655,000	24,500
Peaking Factor (i)	1.64	-

(a) *Based on District-provided water production data for 2016 and 2017.*

(b) *Based on 475 active connections per Section 2.3.*

(c) *Based on production data averaged over 2016 and 2017.*

(d) *Based on 2016-2017 production data for June, July, and August.*

(e) *Maximum day production was recorded on August 1, 2017. Peaking factor is based on maximum day production divided by the annual average day production.*

(f) *Estimated at 160 percent of maximum day production.*

(g) *Based on peak hour production divided by annual average day production.*

(h) *Maximum month production was June 2016 (11,655,000 gal).*

(i) *Based on maximum month production divided by annual average month production for 2016 and 2017.*

2.4.2 Current User Demand/Consumption

Water system user demand (i.e., consumption) is based on individual water meter readings collected by the District. Meters are typically read monthly from April through September. Demand for winter months is calculated using the difference between the last meter reading in the fall and the first meter reading in the spring and averaging this value over the time period it represents. Water system user demand for 2015 through 2017 is summarized in **Table 2-7**.

Table 2-7 – Yearly Demand (Consumption) Data [(a)]

Year	Total (gal)	Average Month (gal)	Maximum Month (gal)	Max Month Peaking Factor
2015	42,618,305	3,551,525	9,881,668	2.78
2016	35,311,263	2,942,605	7,301,132	2.48
2017[(b)]	34,785,672	3,162,334	8,332,670	2.64
Average:	37,571,747	3,218,821	8,505,157	2.63

(a) *Based on District-provided water meter readings.*

(b) *Consumption data for 2017 is only through September due to the District's water meter reading schedule. Consumption for these months in 2017 have been estimated using very similar historical values during 2015 and 2016 for the same time period. In addition, the months of August and September 2017 were combined and the meters read at one time at the end of September.*

Average water demand based on meter readings from 2015 through 2017 is approximately 37.57 million gallons per year. This equates to demand per connection (475 active connections) of approximately 79,100 gallons per year or 217 gpd. This demand is lower than similar systems but is likely a result of the District's seasonal population (i.e., many homes in the District are not occupied year-round) and the lower per household population of 1.91 in the District compared to surrounding counties (approximately 2.5 people per household).

What is most notable about this meter data is that it greatly differs from the production data presented in **Section 2.4.1**. Further discussion of this discrepancy will be provided in **Section 2.4.4**.

2.4.3 Future Production Requirements

Future production based on existing production data (**Section 2.4.1**) and future connection projections (**Section 2.3.3**) is summarized in **Table 2-8**.

Table 2-8 – Future Production Required

Year	Total Connections	Required Production (gpd)		
		Average Day [(a)]	Maximum Day [(b)]	Peak Hour [(c)]
2017 (Existing)	475	233,500 (162 gpm)	476,300 (331 gpm)	763,400 (530 gpm)
2027	568	279,500 (194 gpm)	570,200 (396 gpm)	914,000 (635 gpm)
2037	679	334,100 (232 gpm)	681,600 (473 gpm)	1,092,500 (759 gpm)
2047	812	399,500 (277 gpm)	815,000 (566 gpm)	1,306,400 (907 gpm)

(a) *Based on production of 492 gallons per day per connection.*

(b) *Based on a peaking factor of 2.04 (see **Table 2-6**).*

(c) *Based on a peaking factor of 3.27 (see **Table 2-6**).*

The average day and maximum day demands for the 20-year planning period are **334,100 gpd** and **681,600 gpd**, respectively. The data for the 10-year period beyond the planning horizon is provided for informational purposes.

It should be noted that the following section of this analysis (**Section 2.4.4**) will detail the large amount of non-revenue water that is currently being experienced by the District's water system. Reducing the portion of this non-revenue water that is attributed to system leaks will greatly reduce the projected future production and storage needs of the District.

2.4.4 Non-Revenue Water

Non-revenue water is the difference between water produced and water sold. Non-revenue water is typically the result of leaks in the system, inaccurate water meters, or unauthorized use. The typical goal for most water systems is to have less than 10 percent non-revenue water, with five percent or less considered to be ideal. Non-revenue water for the District based on 2015-2017 data is summarized in **Table 2-9**, with the data from 2016 and 2017 focused on for analysis.

Table 2-9 – Non-Revenue Water (2015[(a)] - 2017)

Year	Production (gal)	Consumption (gal)	Difference (gal) – Non-Revenue Water	Percent of Production (%)
2015 [(a)]	*118,216,900*	*42,618,305*	*75,598,595*	*64.0*
2016	96,126,600	35,311,263	60,815,337	63.3
2017	74,479,300	34,785,672	39,693,628	53.3
		2016-2017 Average:	50,254,483	58.3

(a) *Production data for 2015 is provided for reference only. 2016 and 2017 are the years that are further analyzed and averaged.*

While the data for 2015 is presented here for reference purposes, that year in general is considered atypical due to the significant wildland fire that began in the Cape Horn Area and burned into the Bayview Area of the District. As indicated in previous sections, this fire burned several houses and other structures within the District during this event. In addition, there was a subsequent wildland fire in the neighboring area that may have also contributed to the non-revenue water during this year as the hydrants were used frequently during the summer of 2015. In 2015, the area also experienced very dry climatic conditions leading to above normal production and consumption as compared to 2016 and 2017.

Non-revenue water for the District averages 58.3 percent for 2016 and 2017. This means the District lost over one-half of its production between its sources and the point of use. This is significantly higher than the typical target of 10 percent. Averaged over 2016 and 2017, this represents approximately 50.2 million gallons lost each year. Later sections of this report will go into more detail regarding this significant system deficiency.

2.4.5 Fire Flow

Fire flow capacity is the ability of the water supply system to deliver flow for firefighting purposes, in addition to the maximum day demand, while maintaining a residual system pressure of no less than 20 pounds per square inch (psi). Fire protection is provided to District patrons by the Timberlake Fire District. Fire flow provisions for municipal-type water systems are listed in Idaho Fire Code, which is based on the International Fire Code, and National Fire Protection Association (NFPA) Standards. The provisions of these codes and standards are not mandatory unless specifically adopted by the District via ordinance. The extent of the system's fire flow capacity will affect fire insurance ratings for District residents as well as the safety and security for the future.

The minimum fire flow volume and duration for one- and two-family dwellings less than 3,600 square feet is 1,000 gpm for one hour, per Idaho Fire Code (60,000 gallons total if derived from stored water).

The minimum fire flow and duration for buildings other than one- and two- family dwellings are based on building area and construction type as defined by the International Building Code. A reduction in flow of up to 75 percent is allowed if buildings are equipped with an independent fire suppression system (e.g., sprinklers), but flow may not be less than 1,500 gpm for the prescribed duration as listed in Idaho Fire Code.

While the US Naval Detachment facility is connected to the District's system, they provide and maintain all their own mains and fire hydrants within the boundary of their facility (generally inside the fenced area).

According to telephone conversations with the current Timberlake Fire Chief (Bill Steele), the existing larger residential and commercial buildings in the Bayview area of the District were approved by prior Fire Chiefs with the available fire flow at that time.

Based on the fire flow data that has been compiled and previous Fire District policies, Chief Steele indicated that there is always room for improvement but that there were generally no glaring inadequacies based on existing conditions for residential areas, with the exception of the inadequate and very small tank (11,000 gallons) in the Dromore area. With that said, Chief Steele also indicated that the Fire District would prefer to see the following target fire flows and duration be addressed in future water system improvements:

- Residential Areas (single family homes up to 3,600 SF): 1,000 gpm for one hour

- Larger Residential/Commercial Areas: 1,500 gpm for two hours, assuming the buildings have independent fire suppression systems (e.g., sprinklers).

Any future large residential or commercial construction would need to be evaluated by Timberlake Fire based on building construction materials, building area, location, and available fire flow.

During the construction project that extended water service out to the Cape Horn Area in 2002, the Fire District indicated that a flow of 500 gpm for two hours (60,000 gallons) was the requested goal since it was considered a rural area with inadequate water supply. One of the areas that was deemed acceptable at that time was the far end of the Cape Horn that had a total of 60,000 gallons of existing storage serving approximately 15 households.

These discussions and telephone calls with Chief Steele are summarized in an e-mail dated September 14, 2018 and included in **Appendix 2-D**.

Fire flow testing data provided by Timberlake Fire indicates between 431 gpm and 2,507 gpm is available, at various pressures, depending on hydrant location in the system. The available hydrant testing data performed by Timberlake is summarized in **Table 2-10** with the hydrant testing reports included in **Appendix 2-D**. These hydrants were flow tested between 2010 and 2015 (not every location is tested each year). Review of this hydrant data showed some interesting issues that should be specifically pointed out:

- The low-flowing hydrants along Hudson Bay Road (746-750) do not appear to have been tested since 2010.
- Hydrants within the Naval Detachment are not considered part of the District's infrastructure. However, Timberlake Fire does perform flow tests on the Navy's hydrants (1,276 – 2597 gpm range).

Table 2-10 – Fire Hydrant Testing Summary

Hydrant Number	Location	Static Range[(a)]	Residual Range[(a)]	Average Flow[(a)(b)]
702	16010 E 5th St & N Spruce Ave	85-95	30-50	1248
703	16262 E 1st St & N Fir Ave	80-90	20-30	821
705	34082 E 4th St & N Fir Ave	50-60	15-20	615
706	16025 E 5th St & N Pine Ave	50-60	17-20	661
707	E 5th St & N Spruce Ave	60-70	20-22	666
708	17974 E Highway 54	100-110	45-58	1179
709	33955 N Moonbeam Ct & E Highway 54	85-125	25-30	736
712	E Bannock Dr & Cape Horn Dr	75-80	48-56	1651
713	17375 E North Shore Ln & E Arapaho Rd	50-58	10-18	447
714	17724 E North Shore Ln	70-80	20-25	612
715	E North Shore Ln	70-79	25-30	797[(*)]
716	34325 N Limekiln Rd	60-80	25-40	980
717	17105 Cape Horn Dr	30-50	0-20	431
718	N Limekiln Rd/Bitterend Marina	70-83	28-48	1127
719	N Limekiln Rd/Scenic Bay Marina	92-100	54-70	1697
720	N Limekiln Rd & E Pier Rd	78-92	40-52	1403
721	N Cottonwood Ct & Cape Horn Dr	55-60	20-25	664
722	34317 W Main Ave & N Bardill St	58-70	22-28	822
723	16205 N Cherokee Rd & E Perimeter Rd	50-55	14-18	631
724	W Main Ave & E 5th St	90-98	52-80	1879
726	16415 E 4th St & N Pend Oreille Dr	65-75	20-50	907
727	E Hudson Bay Rd & N Stubs St	80-88	50-60	1638
728	E Hudson Bay Rd & N Stubs St	80-90	60-62	1855
729	17035 E Hudson Bay Rd	72-76	38-42	1213
730	17451 E Hudson Bay Rd	75-85	25-36	1014
731	17245 E Hudson Bay Rd	60-80	25-30	856
732	E Hudson Bay Rd /End of the Rd	58-70	15-20	704
737	Cape Horn Dr & N Raven Pl	80-90	37-65	1674
738	N Raven Pl/Bottom of Hill	120-135	58-95	1939
739	34155 N Pend Oreille Dr & N Pine Ave	125-136	65-90	1736
740	20104 Cape Horn Dr & N Terrace Dr	80-90	60-72	2117
741	20572 Cape Horn Dr	125-130	55-110	2507
742	20400 Cape Horn Dr & E Lower Cape Horn Rd	100-124	70-90	2248
743	34396 Cape Horn Dr	90-100	60-70	1694
744	34216 N Flattery Rd	115-128	70-90	1929
745	18982 E Slide Bay Rd	115-125	62-65	1593[(*)]
746	E Hudson Bay Rd	60	20	581

Hydrant Number	Location	Static Range(a)	Residual Range(a)	Average Flow(a)(b)
747	18284 E Hudson Bay Rd	65	18	519
748	E Hudson Bay Rd	60	20	531
749	E Hudson Bay Rd	100	20	531
750	E Hudson Bay Rd	100	40	876
751	E Waller Rd	42-70	12-24	539
752	E Waller Rd	40-55	10-50	820(*)
753	W Main Ave	85-88	30-64	1800
754	E 5th St	82	30-55	1523
755	N Terrace Dr	60-68	40-50	1364
756	Cape Horn Dr/Cape Horn Circle	85	55	1611
757	E 5th St & E Highway 54	87-90	47-50	1418
758	E Highway 54	90	70	1475(*)
759	E Slide Bay Rd & N Jeepster Rd	130	80	1724
760	E Duwamish Dr & Cape Horn Dr	40	18	504
800	Cape Horn Dr & Grandview Ln	95-100	50-58	1435
801	Cape Horn Dr & Glacier Loop	90-102	40-58	1297
802	457 Cape Horn Dr	80-90	48-60	1513
803	842 Glacier Loop/At the Y	92-115	6-80	1494
804	422 Glacier Loop	34-95	9-60	603
805	635 Glacier Loop	85-100	30-60	1280

(a) *This data comes from tests taken between 2010 and 2015. Not every location has a test from each year.*

(b) *At 20 PSI.*

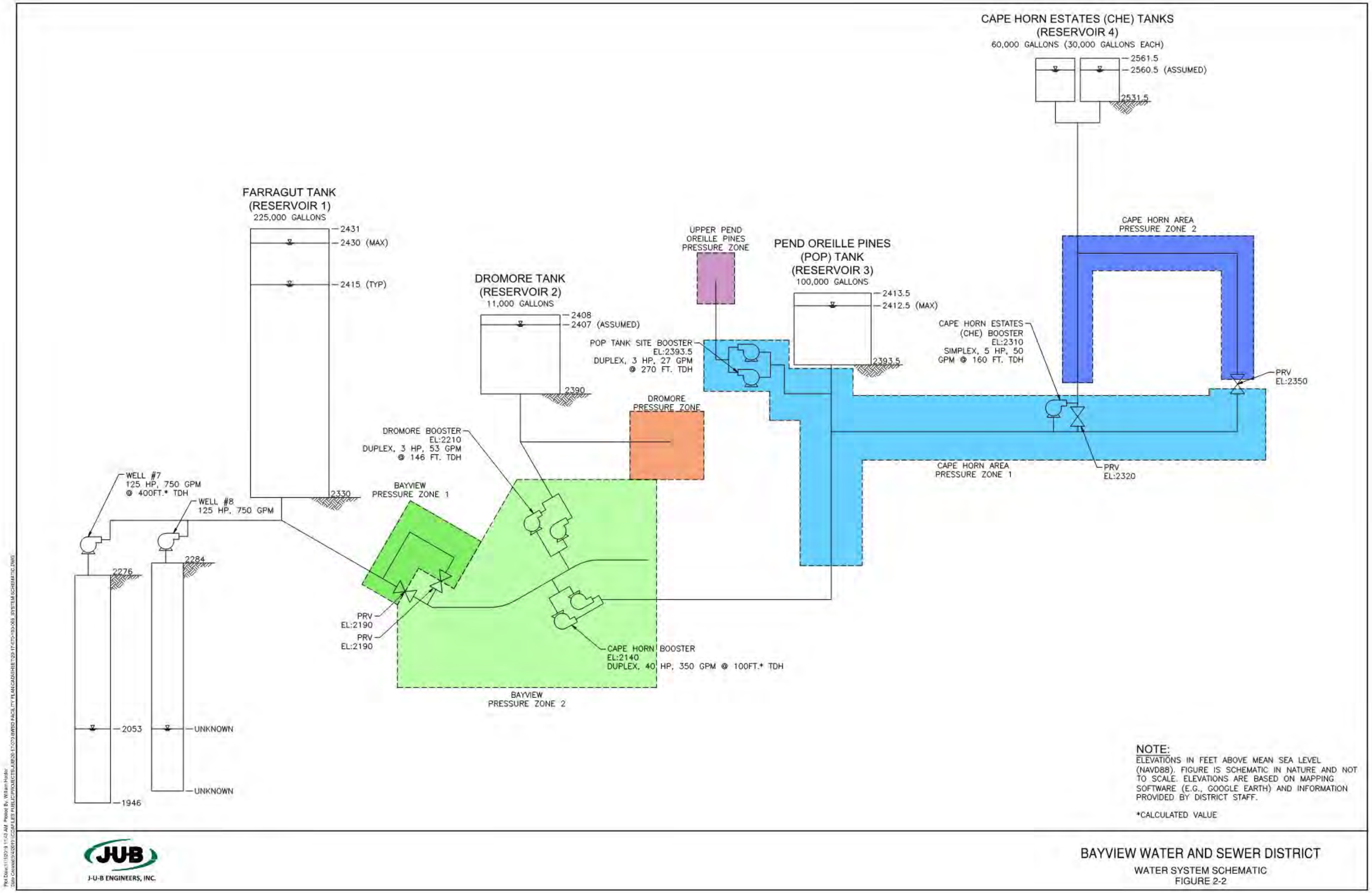
(*) *Contained erroneous zeros in the data. Hand calculated to re-average without erroneous data.*

Review of the fire flow data presented above indicates that there are several residential areas of the District that do not appear to meet the 1,000 gpm fire flow target. The areas of specifically low fire flow appear to be sections of Hudson Bay Road, areas around 5th Street and Pine/Fir, upper areas of Dromore, and near the Post Office. On the other hand, fire flows along Main Street and all throughout the Cape Horn Area appear to be adequate.

2.5 Existing Water System

A schematic representation of the current system is provided in **Figure 2-2.**

Figure 2-2 – Schematic of Current System



Subsequent sections discuss the physical components of the District's existing water system. The existing maps of the water system that are in the District's files are included **Appendix 2-A**.

As part of this water system planning effort, a web-based GIS of the water system (based on the available maps) was developed. Currently, the web-based GIS map is only available to District board members and staff, however, a hard copy map of the District GIS mapping is presented at the beginning of **Appendix 2-A**.

A copy of the latest sanitary survey conducted in April 2019 by the Idaho Department of Environmental Quality (IDEQ) is included in **Appendix 2-B**.

2.5.1 Supply

2.5.1.1 Current Operations

The District has two wells - a main and backup groundwater source. Both of these wells are nearly identical as they were constructed in the early 1940s as part of the former Farragut Naval Base. Both of these wells draw water from the Rathdrum Prairie Aquifer and are located south of the District boundary as shown on **Figure 2-1**.

While each of these wells were originally constructed for the Naval facility, the District acquired these wells in slightly different ways. Well 7 was acquired by the District in the late 1970s by the US Navy, along with the transmission line and Farragut Tank. Well 7 is controlled by the District under a 50-year lease that is due to expire in November 2027. Discussions with the local Navy personnel has indicated that they anticipate the lease would be extended as they have no desire to utilize the well other than receiving potable water from the District. They did caution that it could be a lengthy process and the District may want to start that process at least a year early to ensure that they can extend the lease without a lapse.

Well 8 was later acquired sometime in the 1990s through a permit/lease with the State of Idaho, who had acquired the remainder of the original land and Farragut Naval infrastructure in the 1950s from the Federal government. Well 8 is controlled by the District under a 10-year permit that requires renewal in December 2024.

It should be noted that the District does not chlorinate these well sources on full-time basis, but it does have liquid chlorination facilities that are occasionally utilized on an as-needed basis.

Each of the District's well sources have a licensed water right from the Idaho Department of Water Resources (IDWR). After reviewing each water right, it is recommended that the District convert its water right on Well 7 to a municipal water right designation instead of a right with separate irrigation, commercial, domestic, and fire protection diversion rates and annual volume caps. The designation for Well 8 has already been changed to municipal.

The benefit of changing to a municipal designation allows the District to tie the place of use to its official boundary (and any future boundary changes). In addition, it also allows for a much greater flexibility to serve the various needs and demands of the District as they may change over the years. **Table 2-11** summarizes the District's water right information for each source. Water right and other well information for the well sources is included in **Appendix 2-E**.

Table 2-11 – District Water Rights

Parameter	Well 7	Well 8
IDWR ID Number	95-9880	95-9880
IDWR Type	Water Right	Water Right
Priority Date	07/17/1981	08/27/1998
Beneficial Use		
Irrigation	Yes	N/A
Commercial	Yes	N/A
Domestic	Yes	N/A
Fire Protection	Yes	Yes
Municipal	N/A	Yes
Use Dates		
Irrigation	3/15 – 11/15	N/A
Commercial	1/01 – 12/31	
Domestic	1/01 – 12/31	N/A
Fire Protection	1/01 – 12/31	1/01 – 12/31
Municipal	N/A	1/01 – 12/31
Diversion Rate		
Irrigation	1.67 cfs (749 gpm) [a]	N/A
Commercial	0.5 cfs (224 gpm) [a]	N/A
Domestic	0.54 cfs (242 gpm) [a]	N/A
Fire Protection	1.67 cfs (749 gpm) [a]	1.7 cfs (763 gpm) [a]
Municipal	N/A	1.7 cfs (763 gpm) [a]
Annual Volume Cap		
Irrigation	504 AFA (164.2 MG) [b]	N/A
Commercial	103.7 AFA (33.8 MG) [b]	N/A
Domestic	229.2 AFA (74.7 MG) [b]	N/A
Fire Protection	N/A	N/A
Municipal	N/A	731.4 AFA (238.3 MG) [b]

(a) *Cubic Feet per Second (equivalent to 448.8 gpm)*

(b) *Acre-Feet Annually (equivalent to 325,829 gallons per year)*

Well 7

Based on record information, Well 7 appears to have been drilled with "extra heavy wall oil well casing" that has a 18.625-inch outside diameter and a 17.75-inch inside diameter (0.875-inch wall thickness). It was originally constructed in the early 1940's and is approximately 330-feet deep (record elevation of 2270.5). The as-built information reports that the bottom 67 feet of the casing was perforated. The static water level (SWL) in 1943 was reported as 223-feet below ground surface (BGS) with the top of the bowls of the pump around 270-feet BGS. The surrounding formation below the SWL is a mixture of sands and gravels of various sizes.

The 125-hp motor is believed to have been re-built within the last 10 years and is reported to function very reliably. In conjunction with 8-inch column piping and pump, this vertical turbine system has an operator-observed capacity of 750 gpm. There is a backup generator at this well site, however it only functions in manual mode as there is no automatic transfer switch.

Well 8

Well 8 is believed to have been constructed around the same time as Well 7. While it appears to have been constructed in a very similar manner, there are no known record drawings or information for this well that have been found to date. As with Well 7, the motor on Well 8 is also believed to have been rebuilt recently. This site does not have a source of backup power in the event of a power outage.

Well Source Summary and Analysis

Well and pump information for both sites are summarized in **Table 2-12**.

Table 2-12 – Well and Pump Summary

				Well Information		
Well	Pump Type	Horsepower (HP)	Estimated Capacity (gpm)	Well Depth	Original SWL	Pump Depth
Well 7 (primary)	Vertical Turbine	125	750	330 feet	223 bgs	270 bgs
Well 8 (backup)	Vertical Turbine	125	750	unknown	unknown	unknown

Historically, Well 7 has been utilized as the primary source used by the District to meet their demands. From 2015 through 2017, Well 8 accounted for less than one percent of the total production of the District. Well 7 responds to all "calls-to-run" while Well 8 is only activated if there is a low tank situation or an emergency when Well 7 is out of service. The District is currently considering utilizing these wells in an alternating lead-lag control, rather than having Well 7 always be the lead.

These wells are located about 1,900-feet from each other and at approximately the same ground level elevation. Groundwater that is produced by both of these wells is measured at each of the well houses using newer 4-inch propeller-style flow meters, then pumped through a transmission line to the Farragut Tank. The shared 10-inch portion of the transmission line is capable of adequately handling the combined flow of both of these wells.

IDEQ has noted that the discharge piping of both wells has torpedo casings used for surge suppression which should be replaced with pump control valves and the capability to pump to waste. In addition, current design standards require pressure relief valves on the pump discharge which neither well pump currently has. System controls are dated and pump run status can only be confirmed by going to the well house (no remote access is available.)

Since these wells have similar capacities, the production capacity with the largest unit out of service (i.e., firm capacity) is 750 gpm. Therefore, the firm capacity of the District's supply is about 40 percent greater than the estimated existing peak hour demand of 530 gpm shown in **Table 2-6**.

The District’s supply system also has ample ability to provide for the peak hour demand (or the maximum day demand plus equalization storage) under normal operation conditions with any source out of service per the redundancy requirements of the Idaho Administrative Procedures Act (IDAPA) 58.01.08.501.17.

Emergency Interconnection with Farragut State Park
Although technically not a supply for the District, the intertie with Farragut State Park (FSP) is mentioned here as an emergency source. Portions of the District and FSP systems were at one time part of the same water system that served the Farragut Naval installation in the 1940s. Until about 2000, these systems were only separated by a single gate valve. With cooperation between the District and FSP, the District installed a valve vault with an electrically actuated solenoid (normally closed) valve to be able to remotely open this interconnection from inside the wellhouse at Well 8. There is also a hand-operated gate valve inside of this vault to more effectively maintain the separation of the two water systems.

This interconnection can be utilized by the District (in coordination with FSP) in the event of an emergency to supply the District’s water system on a temporary basis.

Conversely, the District’s wells can supply the FSP water system, albeit at a reduced pressure that is inadequate to meet FSP demands during summer months when FSP is fully operational. The District’s wells do not have adequate head to fill the FSP main reservoir and can only provide “on-demand” supply. FSP recently (winter 2018/2019) utilized the interconnection with the District to supply water to the FSP headquarters while FSP conducted repairs on the water system for the headquarters building. Use of the interconnection was necessary since the FSP main reservoir was dewatered and offline for the winter.

2.5.1.2 Identified Deficiencies

- Well 7 (primary) does not have an automatic transfer switch to engage the existing generator during an emergency (manual operation only).
- Well 8 (backup) does not have a dedicated backup/standby power source (generator).
- Controls system (SCADA) that dictates when pumps are called to run needs updating for reliability and remote review.
- Well 7 and Well 8 utilize torpedo casings on the discharge piping as “surge tanks” to control transience (e.g., water hammer) in the pipelines.
- Well 7 and Well 8 do not have a “pump to waste” cycle.

2.5.2 Storage

2.5.2.1 Current Operations

The storage component of the District's water system is comprised of 4 tanks. Refer to the system map shown in **Figure 2-1** for their locations**.**

Reservoir 1 – Farragut Tank

The District's primary storage is a 225,000-gallon concrete storage tank, originally constructed in the early 1940s. It is located southeast of the District's boundary in a portion of what is now Farragut State Park. Although it appears to be a standpipe, the tank actually has an elevated floor that is about 2/3 of the way up the 101-feet of height with an internal overflow (record drawings indicate a max water surface of 2430.0, working surface of 2415). Currently the tank appears to be operated with a maximum water depth of around 20-feet, based on a temporary pressure sensing probe placed in the tank for several weeks in March 2018. The base of the tank is at an approximate elevation of 2,330-feet and has a diameter of 38-feet. The original roof was replaced with a welded steel roof in the late 1980s and it has a screened vent and a single 2-foot square access hatch. Access to the tank lot is from a gated road within Farragut State Park. The road is generally well-maintained and can be plowed for year-round access.

This tank is controlled by the District under the same 50-year lease as Well 7 that is due to expire in November 2027. Discussions with the local Navy personnel have indicated that they anticipate the lease would be extended as they have no desire to utilize the well/tank/piping facilities and are content to continue receiving potable water from the District. They did caution that it could be a lengthy process and the District may want to start that process at least a year early to ensure that they can extend the lease without a lapse.

In November 2017, the District had this tank cleaned and inspected via remote operated vehicles (ROV) and an underwater drone. This inspection revealed widespread and significant areas of failure in the coating on the walls, floor, and interior supports.

This tank was also reviewed by a structural engineer in December 2017 to determine any deficiencies and to establish an approximate remaining life of the aging structure. In summary, the report noted numerous cracks that were leaking (and most likely causing further damage to the reinforcing steel), potential safety concerns with the doors and access ways, and a likely remaining functional life of about 25 years (with rehabilitation). The main concern with this tank is that due to its age and the way it was likely designed and constructed, it may not meet current building code requirements for earthquake resistance. The full report can be found in **Appendix 2-F.** In addition, the access to the tank including stairs and landings are in poor condition and may present a safety concern. IDEQ noted the absence of watertight gaskets on the access hatch and that the overflow outlet needed to be exposed and protected. The system operators have completed both tasks.

This tank serves as the main source of storage for all the District. The wells feed this tank directly and all other storage facilities within the District are fed out of this tank by booster pump stations in the distribution systems. Therefore, for the purpose of this report, this tank will be analyzed as the main source of finished water storage for the District. Other storage facilities of the District are also described below.

As the District's main storage reservoir, the Farragut Tank can only be taken offline for service or maintenance upon agreement from FSP to provide storage and service to the entire District for a distinct period of time during FSP's offseason in the winter months. FSP's main storage reservoir is normally taken offline and dewatered during the winter when demands at the Park are significantly reduced; the FSP headquarters building is served by a small, independent pressure tank system during this time.

During periods when the FSP tank is not in use, the District could potentially take the Farragut Tank offline and serve their system using only Well 7 and Well 8 in an "on-demand" mode, but this option is likely impractical since none of the well pumps have VFDs and are "hard on/hard off." Operation of the wells without storage would be difficult to control and result in additional strain on the pumps and associated controls and piping. Similar to the pump controls, the tank level controls are dated and unable to be monitored remotely.

Reservoir 2 – Dromore Tank

This tank is a small welded-steel tank that was installed sometime in the late 1970s or early 1980s as the Dromore area on the north side of Bayview was developed. It has a reported capacity of 11,000 gallons (11-feet diameter, 18-feet height) at a record base elevation of 2386. It serves about 20 homes in the northeast portion of Bayview and is fed by a small duplex 3-hp booster station. The pumps are controlled by floats in the tank that call the pumps to run in an alternating lead/lag configuration.

This tank is undersized for any fire suppression capabilities. It also has an above-grade discharge pipe that is covered with insulation, but is susceptible to freezing. The exterior does not appear to have been painted or maintained in the last decade or perhaps longer. There are also several taste complaints in this area with reports of black flakes in the water.

Reservoir 3 – Pend Oreille Pines Tank

This 100,000-gallon at-grade welded steel tank was installed in 2002 with the project that extended the District's water service to the Cape Horn area. It has a base elevation of 2393.5 and has a 30-foot diameter and a height of 20-feet. It is fed by the main Cape Horn Booster, which is a duplex 40 hp system (each pump rated at approximately 350 gpm).

A radio telemetry system monitors the transducer in this tank and calls on the duplex booster to pump in an alternating lead/lag fashion.

This tank supplies water to the majority of the residents of the Cape Horn area and can meet the target fire flow of 1,000 gpm for one hour.

There are no reported or observed deficiencies for this storage facility.

A 3 Hp, 27gpm booster pump draws water from the thank station and feeds the small upper Pend Orielle Pines pressure zone.

Reservoir 4 – Cape Horn Estates Tanks

There are two identical 30,000-gallon at-grade welded steel tanks that are side-by side at this location (total storage of 60,000-gallons). They were originally installed in the early 1970s with the development of the Cape Horn Estates subdivision. During the 2002 construction project that extended the District's water service to the Cape Horn area, these tanks were refurbished, and the interiors were re-coated. The base elevation is 2531.5 with an estimated diameter of 13 feet.

These tanks serve fewer than 20 homes in the northeast corner of the District. In the event of an emergency, pressure-reducing valves (PRV's) would allow water from these tanks to drain into the lower pressure zone that serves the majority of the Cape Horn area. These tanks are fed by the small Cape Horn Estates simplex 5-hp (50 gpm) booster and controlled by the level in the tanks (via a buried wire and transducer in the tanks. Note that historically the District has maintained a replacement pump in the District inventory for this booster (it is unknown if a replacement is currently in the District's inventory).

There are no reported or observed major deficiencies for this storage facility. However, there appears to be some minor flaking of exterior paint near the top of these tanks that should be addressed as a maintenance project. These tanks are unable to meet the target fire storage of 1,000 gpm for one hour.

System Storage Analysis

Components of finished water storage, as defined by IDAPA 58.01.08.003.16, for the District are summarized below.

1. Dead Storage – Storage that is either not available for use in the system or can provide only substandard flows and pressures.

- All of the District's storage is available for use in the system to provide adequate flows and pressures. Therefore, the District does not need to account for any Dead Storage.

2. Effective Storage – All storage other than dead storage, including operational, equalization, fire suppression, and standby.
3. Operational Storage – Storage that supplies water when, under normal operating conditions, the sources are off. This component is the larger of 1) the volume required to prevent excess pump cycling and to ensure that the equalization, fire suppression, and standby storage components are full and ready for use when needed or 2) the volume needed to compensate for the sensitivity of the water level sensors.
    - The "dead-band" volume between the level sensors in the main storage tank should be accounted for since this volume is required for the District to fully supply the Equalization Storage, Fire Suppression Storage, and Standby Storage components. For example, the level sensors in the District's control system allow the level in the main tank to drop approximately 1.5-feet, which represents a volume of approximately 12,800 gallons.
4. Equalization Storage – Storage required to compensate for the difference between a water system's maximum firm supply capacity and peak hour demand.
    - Peak hour demand is estimated at 160 percent of maximum day production based on available diurnal information from nearby systems (reference **Section 2.4.1**). The District's firm supply capacity (i.e., capacity with the largest pump out of service) is 750 gpm. Since the estimated existing peak hour demand is 530 gpm (**Table 2-6**), there is no need for equalization storage in the Farragut tank. Future equalization storage, based on 20-year future demand presented in **Section 2.4.3**, is approximately 9 gpm (difference between 759 gpm demand and 750 gpm supply) or approximately 590 gallons for the small period of time where the future demand exceeds the firm capacity.
5. Fire Suppression Storage – Storage needed to support fire flow in systems that provide it.
    - The following list summarizes fire flow storage recommendations based on fire flow and duration information presented in **Section 2.4.4**.
        i. 60,000 gallons (500 gpm for two hours) – previously approved for the Cape Horn Estates area.
        ii. 60,000 gallons (1,000 gpm for one hour) – target for residential areas of the District (one- and two-family dwellings).
        iii. 180,000 gallons (1,500 gpm for two hours) – target for commercial and multi-family structures in Bayview
    - Additional storage may be considered to accommodate commercial and multi-family structures without independent fire suppression systems as well as to provide broader benefits for the entire community, including emergency wildland firefighting needs.
6. Standby Storage – Storage that provides a measure of reliability should sources fail or when unusual conditions impose higher than anticipated demands. Normally used for emergency operation to provide water for eight hours of operation at average day demand, if standby power is not provided.

- The District does provide standby power for its primary supply source (Well 7). However, it is not automatically engaged with a transfer switch (manual only). Therefore, the required existing Standby Storage is 8 hours at average day demand or approximately 77,800 gallons for the Farragut tank. Future standby storage (without automatic back-up power), based on 20-year future demand presented in **Section 2.3.3**, is approximately 111,400 gallons.

Having a source of automatic backup power at the District's sources could reduce both the existing and future projected required storage volumes. Per IDAPA 58.01.081, emergency storage could be adjusted by adding standby power, sharing reliability in an alternative way, or through a decision by the Board or public that reduced reliability is acceptable to consumers. A summary of existing storage information is presented in **Table 2-13**, while future storage information is summarized in **Table 2-14**. Both tables assume existing production capacity.

Table 2-13 – Existing Storage Summary (2017)

Tank	Size	Operational Storage	Standby Storage	Equalization Storage	Fire Storage (gallons)	Total (gallons)	Deficiency (gallons)
Farragut	225,000	12,700[(a)]	77,800	0	180,000[(d)]	270,500	45,500
Dromore	11,000	1,400[(b)]	2,300	0	60,000[(e)]	63,700	52,700
Pend Orielle Pines	100,000	10,600[(b)]	0[(c)]	0	60,000[(e)]	70,600	0
Cape Horn Estates	60,000	2,000[(b)]	0[(c)]	0	60,000[(e)]	62,000	2,000

(a) *1.5' operating depth*

(b) *2' operating depth (each tank)*

(c) *Standby power provided*

(d) *1,500 gpm for 2 hours*

(e) *1,000 gpm for 1 hour*

Table 2-14 – Future (2037) Storage Summary

Tank	Size	Operational Storage	Standby Storage	Equalization Storage	Fire Storage (gallons)	Total (gallons)	Deficiency (gallons)
Farragut	225,000	12,700[(a)]	111,400	540	180,000[(d)]	304,640	79,640
Dromore	11,000	1,400[(b)]	3,300	0	60,000[(e)]	64,700	53,700
Pend Orielle Pines	100,000	10,600[(b)]	0[(c)]	0	60,000[(e)]	70,600	0
Cape Horn Estates	60,000	2,000[(b)]	0[(c)]	0	60,000[(e)]	62,000	2,000

(f) *1.5' operating depth*

(g) *2' operating depth (each tank)*

(h) *Standby power provided*

(i) *1,500 gpm for 2 hours*

(j) *1,000 gpm for 1 hour*

2.5.2.2 Observed Deficiencies

- Farragut Tank has visible leaks and notable deterioration (spalling) of the interior and exterior coating system.
- Access stairs, ladders, railings, etc. for Farragut or Dromore tanks do not meet current Occupational Safety and Health Administration (OSHA) standards.
- Farragut Tank has an estimated remaining functional life of 25 years (with rehabilitation of coating system), and may not meet current building code requirements for earthquake resistance.
- Farragut Tank does not meet target fire storage without standby power at water supply wells.
- Dromore Tank needs cleaning and re-painting and is undersized at 11,000 gallons.
- The control system (SCADA) should be upgraded to include reliability during power outages, provide more data to the District office, as well as remote access by the system operators.
- Finished water storage volume at both Farragut and Dromore tanks is not adequate to meet current or desired future storage requirements plus desired fire suppression storage goals (based on the target of 1,500 gpm for two hours for commercial areas).

2.5.3 Transmission and Distribution

2.5.3.1 Current Operations

Refer to **Appendix 2-A** for a hard-copy map of the District's web-based GIS map.

Transmission
With the main storage facility and both wells located in Farragut State Park, the District has a substantial amount of transmission line that connects the wells to the tank and the tank to the distribution system. The transmission line is comprised of:

- 720 LF of 12-inch cast iron (connecting Well 7 to shared transmission line to tank)
- 1,600 LF of 8-inch PVC (connecting Well 8 to shared transmission line to tank)
- 3,200 LF of 10-inch cast iron (shared transmission line to tank)
- 1,000 LF of 8-inch cast iron (connecting shared transmission line to distribution system)

Note that the 50-year lease (expiring in November 2027) associated with the Farragut Tank and Well 7 also applies to all of the transmission lines, except the 8-inch PVC portion of line from Well 8 to the shared transmission line. That portion is controlled by the District under a continuing 10-year lease/permit from the State of Idaho that will expire in December 2026.

Distribution
The distribution system is comprised mainly of 6-inch diameter polyvinyl chloride (PVC) pipelines, with some portions of 2-inch, 4-inch, and 8-inch diameter PVC or polyethylene pipelines. The distribution system does have some sections of 8-inch cast iron (near Navy facility) and some 5-steel line in the Cape Horn Estates portion of the District. The composition of the existing distribution system piping is summarized in **Table 2-15**. The District's service area is generally fairly well looped. However, there are a

number of areas where the “dead end” lines are reduced to 2-inch lines to serve the remaining 2-4 connections.

Table 2-15 – Summary of Existing Distribution System Piping Network

Pipe Material	Length (ft) by Pipe Size						Total Length (ft)
	2 in	4 in	5 in	6 in	8 in	Unknown	
PVC	5,100	16,100	---	36,000	7,300	---	64,500
Steel	---	---	4,200	---	---	---	4,200
Polyethylene	---	---	---	---	5,300	---	5,300
Cast/Ductile Iron	---	---	---	---	1,500	---	1,500
Subtotals:	5,100	16,100	4,200	36,000	14,100	0	75,500

The District’s distribution system is classified as a Class I system by the Idaho Department of Environmental Quality (IDEQ). The current contract operator is licensed by IBOL as a Class II Operator for Water Distribution and Water Treatment, which exceeds IDEQ’s requirements for the District.

Hydraulic Analysis

A hydraulic model was developed for the System using Bentley Water.

Model data consisted of pipeline sizes from the District’s new GIS model, pressure reducing valves operating points provided by the District operators, and elevation data from Google Earth.

The model was calibrated using historical pressure and fire flow data provided by the Timberlake Fire District. Pressure data was used to confirm ground elevations. Pressure data was within 15% which is reasonable given the lack of accurate ground elevations and operating data. Fire flow data was used to verify system calibration by applying the historical fire flow to the model node representing the test hydrants and conforming residual pressure. All tests were within 25% of reported conditions which also appears reasonable with the available information.

A summary of the model development is included in **Appendix 2-C**. It should be noted that the model results are adequate for system evaluation and determination of system improvement but should not be used as the basis for design.

Pressure Zone Analysis

The District’s water distribution system has three pressure zones in the Bayview area and two major pressure zones in the Cape Horn area as shown on **Figure 2-2**. In addition, there is a small booster pump station at the main tank in the Cape Horn area that supplies water for the few existing homes that are above the tank. As part of the water system modelling analysis, the focus was placed on the available pressures and flows at the end points of the distribution system by evaluating elevation and friction losses in the system. A summary of system pressures as calculated by the hydraulic model output for maximum day demand conditions is presented in **Figure 2-3** and included in **Appendix 2-C**.

Figure 2-3 – Maximum Day Pressures

Gravity Pressure Zone – Bayview Zone 1
The gravity pressure zone (Bayview Zone 1) is in the southwest residential portion of the Bayview area and is served directly from the main tank (Farragut). It is located south of the mid-block of 4th Street and 3rd Street and west of Highway 54. This area currently serves about 40 connections and is mainly comprised of 6-inch and 4-inch mains, with some small sections of 2-inch lines serving 2-4 connections. The length of the 2-inch lines are generally less than 200-feet. The pressures in this zone range from about 70 psi to 100 psi.

Reduced Passive Zone – Bayview Zone 2
The majority of the rest of Bayview is served by the lower pressure zone (Bayview Zone 2). It is separated from the gravity zone by two pressure reducing valves (PRVs). The PRVs reportedly reduce the pressure by around 60 psi, so most of the lower zone has a resultant pressure range of 45 psi to 90 psi. A few areas in the Northwest corner of this zone, including the intersection of Cherokee/Lyrel and the higher elevations on Waller Road have pressures below 40psi during maximum day demand. This zone is made up of some 8-inch mains, with the majority comprised of 6-inch and 4-inch mains. As with the upper gravity zone, there are some portions of 2-inch lines that feed small sections of the District's residential type connections (generally less than 300-feet in length). There are a few areas of the north side of this.

Dromore Area – Bayview Zone 3
The Dromore area (Bayview Zone 3) is served by a small duplex 3-hp booster that pumps from the lower Bayview pressure zone and into the Dromore tank on the north side of Bayview. It provides service to about 20 existing homes. This Dromore portion of the District's distribution system is not connected back to the lower zone via any PRVs. It is made up of 6-inch, 4-inch and 2 or 3-inch lines. Pressures range from about 25 psi to around 70 psi. The existing Dromore pump station is in fair condition according to the system operator but may need a new pump in the near future. No backup power is provided.

Cape Horn Area – Cape Zone 1
The main pressure zone in Cape Horn area serves the majority of the residents (Cape Zone 1). It is fed by 40-hp booster pump station (each pump at 350 gpm) built in 2002 with standby power. The booster feeds the Pend Oreille Pines Tank. The majority of this section of the District has 8-inch and 6-inch PVC mains that were installed in 2002 to provide service and fire flow to the connections and fire hydrants. There are portions of 5-inch steel (in the Cape Horn Estates area) and some smaller 4-inch and 2-inch lines that serve a small number of residential connections. Pressures in this zone range from 45 psi to 120 psi. Connections near the lake require individual PRVs on the service lines due to the higher pressures (120 psi).

This zone includes a small duplex 3-hp booster pump station (variable speed motors, 27 gpm each pump) that serves the few homes that are above this tank. This small booster station also has standby power.

Upper Cape Horn Estates – Cape Zone 2
The upper portion of the far northeast end of the District is served by a small pressure zone (Cape Zone 2) for less than 20 lots (approximately 13 homes currently). The pipes are existing 6-inch from the original 1973 construction of the Cape Horn Estates subdivision. The pressures range from about 50 psi to 70 psi. This zone is fed by a small simplex 5-hp booster (50 gpm)

from the main Cape Horn pressure zone to the Cape Horn Estates tanks (60,000 gallons). This booster station has standby power available. This zone is separated from the lower Cape Horn zone by two PRVs. Normally, these PRVs should be closed, but would open in the event of an emergency that would drain the main Pend Oreille Pines Tank.

Fire Flow Analysis

Fire flow was evaluated for the system using the hydraulic model under maximum demand conditions and requiring a minimum zone pressure of 20 psi. The resulting range of modelled fire flows are presented in **Figure 2-4**.

Figure 2-4 – Maximum Day Available Fire Flow

Comparing fire flow results to actual Fire District readings revealed significant differences. Upon further investigation, these discrepancies were a result of maintaining the 20 psi minimum zone pressure at higher elevations in each zone. **Table 2-16** indicates the limiting location for each pressure zone.

Table 2-16 – Location for Pressure Zones

Zone	Limiting Node(s)	Location
Bayview Zone 1	J80	Near 1st/Pine
Bayview Zone 2	J67	E. end of E. Hudson Bay Road
Dromore	J114	E. End of E. Duwamish
Cape Horn Zone 1	J60, J107, K155	N. Terrace Drive, E. end of Cape Horn Drive
Cape Horn Zone 2	J62, J190	E. end of Glacier Loop, W. end of Glacier Loop

As a result of these limiting locations, fire flow is less than 500 gpm at the end of Hudson Bay Road, the North part of Bayview Zone 2, the eastern part of Dromore, and the eastern part of Cape Horn Zone 1.

2.5.3.2 Further Review of Non-Revenue Water

During the analysis of production and consumption data for the District, it quickly became evident that there was a continuing pattern of consistently large discrepancies between the data sets. To further understand this large amount of non-revenue water, potential sources were identified:

- Many of the meters in the Bayview area are about 40 years old and past their useful life. As meters age, their accuracy is impacted and the registered volume is reduced (read less than actual use).
- The US Navy Detachment facility is a large connection that is not metered (has at least two 6-inch or 8-inch connections).
- There have historically been significant leaks in the aging transmission lines in the Farragut area.

To further identify a potential source of the non-revenue water, a level probe was placed in Reservoir #1 (Farragut Tank) in March 2018 for about two weeks. During portions of this time, the pumps were shut off some of the evenings and the system was supplied only by the tank until the morning hours. The goal was to see if there was a steady state decrease in the level of the tank that would be indicative of leak. Time periods where there should be essentially no use/demand on the system were closely studied (e.g., midnight to 4 am).

This data did indeed show a steady and consistent reduction of the level of the tank during these periods of at least 40 gpm (almost 60,000 gallons per day). This kind of steady decline would be indicative of leak within the system. After multiple discussions with Navy personnel, it was understood that they were most likely not the source of steady usage. While their use is still unknown due to a lack of meters, their onsite water distribution system is probably not the source of a leak, as it has been completely replaced over the last decade.

The current operators discovered in 2019 that the pre-lube for one of the supply wells was running constantly at 35 gpm or as much as 18 million gallons per year. This has been corrected to operate only when the well pump starts, thereby eliminating a significant percentage of the observed night time leakage. Subtracting this from 2017 production yields 56 MG versus 35 MG of consumption or 21 MG of nonrevenue water (37%). While this volume of non-revenue water is still significant, it represents a marked improvement.

With that information, the aging transmission mains from the original 1940s construction are the suspected location of remaining system leaks due to the following reasons:

- J-U-B has occasionally assisted the District over the past 20 years or so with small projects to repair leaks in this line multiple times.
- The contractor that was used to repair most if not all these joints was consulted and indicated that this area has always been a problem area for the District.
- American Leak Detection assisted the District in 2016 and indicated a number of potential leaks in this area. It is unknown if any of these leaks were addressed by the prior system operators.
- Idaho Rural Water assisted the District in December 2017 with some leak detection in this area. While the results were not definite due to depth of pipe, distance between valves, etc., their preliminary testing indicated that this area did appear to have some more potential leaks.

2.5.3.3 Identified Deficiencies

- There are a number of sections of 2-inch and 4-inch diameter lines that may be a bottleneck during periods of high demand, even though they only serve a small number of residential connections.
- The hydraulic analysis and review of the existing elevation of portions of the District shows that certain points in the system cannot meet maximum day demand at the required minimum pressure of 40 psi (Post Office area, Dromore area).
- The fire hydrant testing results indicate the system cannot provide the desired fire flow of 1,000 gpm in most of the residential areas of Bayview. Fire flows are significantly less if a minimum zone pressure of 20 psi is maintained.
- Some fire hydrants have not been fire flow tested since 2010.
- A significant amount of non-revenue water indicates the high likelihood of significant leaks in the system, believed to be in the transmission line for the Farragut area (refer to **Section 2.5.3.2** for more detail). A substantial reduction of the significant amount of non-revenue water (2016-2017 data) should be a high priority of the District.
- Most of the water meters in the Bayview area are 40 years old and are well past their useful life (generally 20 years). The District reports an increasing number of failing meters that are needing to be replaced.
- The condition of the existing system PRVs is unknown and should be serviced.
- The Dromore Booster Pump Station does not have standby power.
- Current design standards require pressure relief valves and flow meters on all booster pump stations. None of the District stations currently have pressure relief valves.

2.5.4 Current Water Rates

The current water rate structure was adopted by the District in 2016. The District charges a flat fee for a monthly allotment of 5,000 gallons. Subsequent use is charged at a uniform rate per thousand gallons used. **Table 2-17** summarized the District's rate structure.

Table 2-17 – Water Rate Structure

Base Monthly Rate	Overage Charge
$24/5,000 gallons	$1.75/1,000 gallons

The District also charges a one-time hookup fee when new connections are made to the system. Commercial accounts (i.e., restaurants and marinas) are currently charged the same monthly fee based as residential connections. **Table 2-18** summarizes the additional charges associated with the District's water system.

Table 2-18 – Additional Water System Charges

Item	Charge
Multi-family Service	$24/month x No. of units
Late Fee(s)	10% of total owed to District
Hydrant connection	$50 + $3/1,000 gal
Connection Fees	
Residential	$2,700
Commercial	$3,000
Capitalization Fees	
Bayview Area	$2,080
Cape Horn Area	$9,975

2.6 Regulatory Considerations

2.6.1 Current Drinking Water Regulations

All Public Water Systems (PWSs) are subject to the rules contained in the Environmental Protection Agency's (EPA's) *Code of Federal Regulations* (CFR). Through primacy, some states are given the authority to regulate drinking water systems under the CFR. IDEQ is given primacy by EPA, meaning that IDEQ has been given authority by the EPA to enforce the regulations contained in the CFR. While IDEQ is the primacy agency, the EPA still has the authority to implement and enforce Federal drinking water rules.

The District is generally in compliance with current regulations, but IDEQ's 2019 Sanitary Survey identified several deficiencies:

Deficiencies and Requirements:

- Recent studies reported in the 2018 Facility Plan indicate a high probability of significant leakage within aging 10-inch transmission main between wells and Farragut tank and is evaluated as significant deficiency as per IDAPA 58.01.08.542.10.
- The location of the Farragut tank overflow outlet is not known and is evaluated as a significant deficiency. The overflow is required to be located and if necessary modified to allow for the outlet to discharge to day light and be equipped with a 4-mesh expandable mesh screen with weighted flapper or 24-mesh screen as per IDAPA 58.01.08.546.03.
- The Farragut tank access hatch is not equipped with a water tight gasket as per IDAPA 58.01.08.544.03.

Other follow-up items and recommendations by IDEQ are provided in the cover letter of the Sanitary Survey included in **Appendix 2-B.**

2.6.2 Cross-Connection Control

The District currently has a cross-connection control resolution (Resolution 03-3) that addresses the District's policy on protecting the water system from connections that could backflow or back-siphon contaminants or pollutants into their system.

A copy of this resolution is provided in **Appendix 2-G**.

2.6.3 Water Quality Reporting

As required, the District annually tests their drinking water for certain contaminates. The water quality report for 2017 is posted on the District's website and indicates that they have no violations, except for a monitoring violation. This monitoring violation occurred as a result of the unfamiliarity of the new operator taking a sample from an area that he believed was part of the Cape Horn Area but was not.

A copy of this 2017 Water Quality Report is available in **Appendix 2-H**.

Appendices

Appendix 2-A – System Maps
Appendix 2-B – IDEQ Sanitary Surveys
Appendix 2-C – Hydraulic Calculations
Appendix 2-D – Fire Hydrant Testing Reports
Appendix 2-E – Groundwater Water Right Information
Appendix 2-F – Initial Structural Assessment – Farragut Reservoir
Appendix 2-G – Cross-Connection Control Resolution
Appendix 2-H – 2017 Water Quality Report

Appendix 2-A

System Maps

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Bayview Water & Sewer District - Water System Map

1/17/2019 2:32:19 PM

Pump Station
Tanks
6"
Valves
Pipes
8"
PRVs
Wells
2"
10"
BWSD Boundary
4"
12"
Kootenai County Parcels

1:21,000

0 0.15 0.3 0.6 mi

0 0.28 0.55 1.1 km

Esri, HERE, Garmin, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

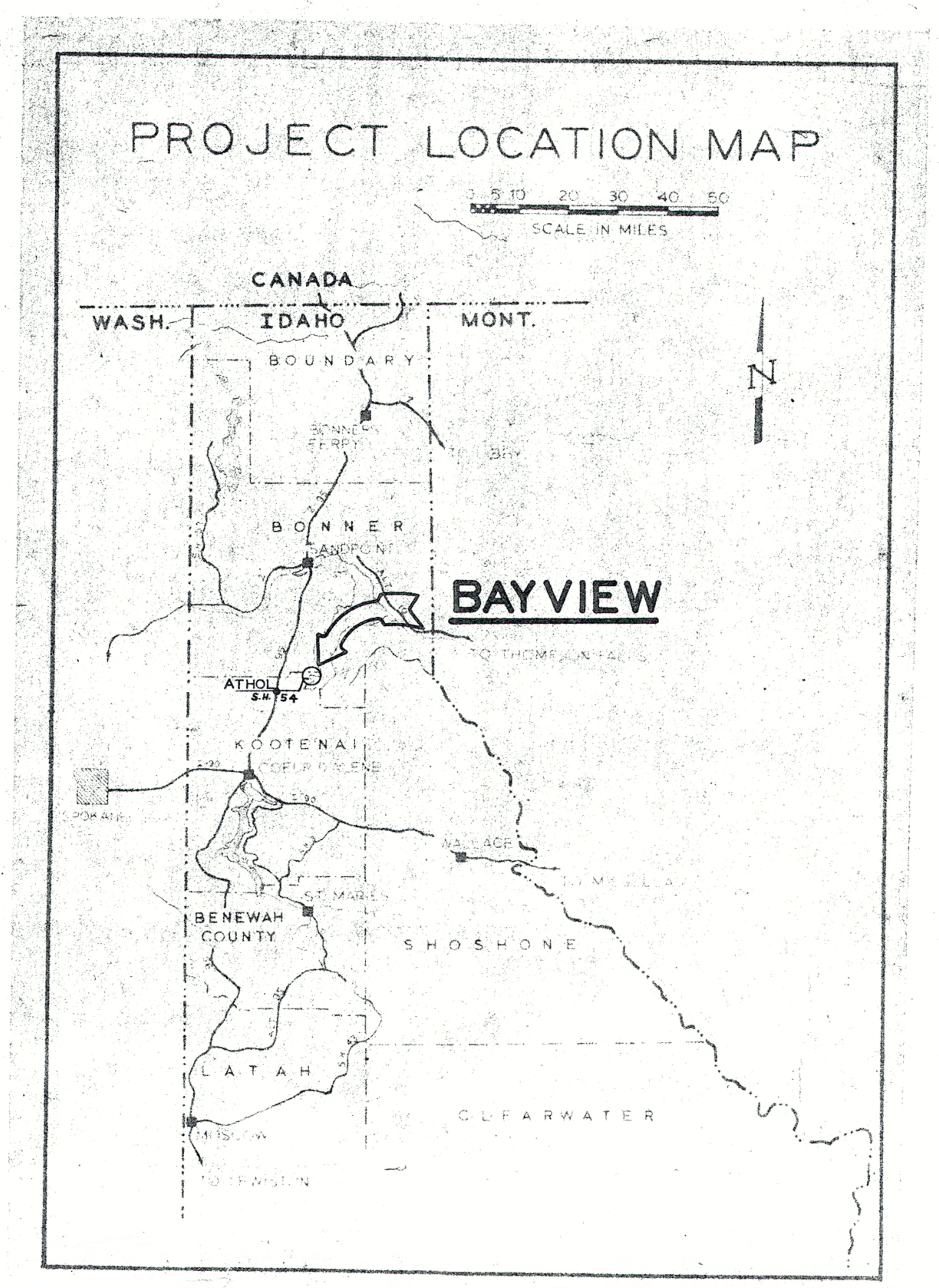
USDA FSA, DigitalGlobe, GeoEye, CNES/Airbus DS | Esri, HERE, iPC |

DOMESTIC WATER SYSTEM

FOR

BAYVIEW WATER AND SEWER DISTRICT

1 NOVEMBER 1977



K.A. DU
& ASS
ENGINEER


DOMESTIC WATER SYSTEM
BAYVIEW WATER & SEWER DISTRICT
SCALE: 1" = 200'
NOVEMBER 1 1977
N
DISTRICT BOUNDARY
BOOSTER STATION
DISTRICT BOUNDARY
Air Vac
Cape Horn Road
County Hwy.
Schaeffer St.
5th St.
6th St.
4th St.
3rd St.
HWY. 54
Main St.
Match Line
Scenic Bay Resort
John's Landing
Bayshore Resort
Boileau's Resort
Bayview Resort
Existing 1 1/2" Galv. Line Used Across Main St.
Existing 8" C.I.
SCENIC BAY
PEND OREILLE LAKE
Ref: 7.0' East to flag on tree
19.5' South to flag on corner post
Ref: 18.5' S.W. to flag on tree
12.0' S.E. to flag on tree
Ref: 32.0' N. to Power Pole
49.5' E. to Name Post
Ref: 45.0' N.E. to flag on tree
21.0 S. to flag on tree
Ref: 84.0' S.E. to Power Pole
102.0' E. to Edge of Well
Ref: 48.0' W. to Power Pole
71.5' S.W. to Hydrant
Ref: 25.0' N.W. to Power Pole
21.0' S.E. to Dead End Sign
Ref: 62.5' N.W. to Power Pole
25.0' N.E. to Power Pole
Ref: 12.0' N.E. to Edge of Hydrant
53.5' S.W. to Edge of 8" Pine tree
Ref: 39.5' W to S.E. Corner of Cabin
52.5' S.E. to 2" Pipe (Antenna Mast)
Ref: 52.0' S.E. to sign
74.0' N.W. to Stop sign
Ref: 31.5' S. to Power Pole
13.5' N.W. to Edge of Hydrant
Ref: 13.0' N to 1 1/2" Service Box
Ref: 46.5' N.E. to flag on tree
76.5 N. to Power Pole
Ref: 22.5' N. To S.W. Corner of Trailer
22.5' S.E. To Fence Corner
Ref: 42.5' S. to Power Pole
72.0 S.E. to Power Pole
Ref: 37.5' S.W. to Power Pole
68.0' N.E. to Power Pole
Ref: 41.0' S. to tele. Pole
43.0' N.W. to house corner
Ref: 71.0' S.W. to Power Pole
73.0 to 8th fence Post Nat. Power Pole
Ref: 41.0' N.W. to Power Pole
28.5' N.E. to S.W. Corner of Cabin
Ref: 16.5' N.E. to Power Pole
37.0' S.W. to 3" pipe sign Post
Ref: 37.0' S. to Stop Sign
44.5' E. to Power Pole
Ref: 15.0' N.W. to Fence Corner
33.0' S.W. to Fence Corner
Ref: 55.0' S.W. To Power Pole
40.0' S.E. to Edge of hydrant
Ref: 44.5' E. to Power Pole
56.5' W. to Power Pole
Ref: 32.0' S.W. to Power Pole
40.0' N.W. to Power Pole
Ref: 13.5' S. to corner post of Cyclone Fence
24.5' S.E. to second intermediate Post of Cyclone Fence
Ref: 19.6' N. to Power Pole
38.5' S. to Stop Sign
45 PSI
110 PSI
LEGEND
WATER LINE (SIZE)
VALVE
FIRE HYDRANT
DETAIL NO. (SHEET 3)
WET SERVICE
DRY SERVICE
COMMERCIAL SERVICE
Note: All services are 3/4" unless shown otherwise
AS BUILT
DOMESTIC WATER SYSTEM
PARTIAL PLAN
DRAWN BY R. L. Maddox
CHECKED BY E.E.S.
REVISIONS 8/9/78 R.M.
FOR BAYVIEW WATER & SEWER DISTRICT
K.A. DURTSCHI & ASSOCIATES
ENGINEERING—SURVEYING
COEUR D ALENE, IDAHO
DATE 11/1/77
SCALE 1"=200
JOB No. 163

SCENIC BAY
LAKE PEND OREILLE
N
Match Line
Summer Elevation 2062.5
Hudson Bay Resort
Vista Bay Resort
Naval Research Center
Existing 8" C.I.
Third
Second
First
Street
Fir
Pine
95 PSI
85 PSI
Ref: 58.5' E. to Power Pole 50.0' S.W. to Nail in tree
Ref: 30.5' S.W. to Nail in tree 39.0' N. to Power Pole
Ref: 50.0' N. to Power Pole 71.5' E. to Edge of Hydrant
Ref: 18.0' SE. to Nail in tree 20.0' S.W. to Nail in tree
DISTRICT BOUNDARY
HUDSON BAY ROAD
Existing Pressure Reducer - 60 Psi Reduction
Ref: 12.0' N. to SW. Corner of Pressure Reducer Bldg. 25.5' W. to Nail in tree
Concrete Valve Box
State Highway 54
FARRAGUT STATE PARK
6" PVC Cl. 160 PVC
40'-6" D&W Steel Pipe
6" Dresser Coupling
5' min.
WATER LINE XING STATE HWY 54
on 20° SKEW
Existing 10" C.I.
Existing 12" C.I.
EXISTING 225,000 GALLON
ELEVATED STORAGE RESERVOIR
Water Surface; Max. 2430.0, Working Surface 2415.0
EXISTING WELL
Pumphouse No. 7
750 GPM
Road to Athol
DOMESTIC WATER SYSTEM
BAYVIEW WATER & SEWER DISTRICT
SCALE: 1" = 200'
SEPTEMBER 13, 1977
LEGEND
WATER LINE (SIZE)
VALVE
FIRE HYDRANT
DETAIL NO. (SHEET 3)
WET SERVICE
DRY SERVICE
COMMERCIAL SERVICE
Note: Services are 3/4 unless noted otherwise.
AS BUILT
DOMESTIC WATER SYSTE
PARTIAL PLAN
DRAWN BY R. Maddox
FOR BAYVIEW WATER & SEWER DISTRICT
CHECKED BY E.E.S.
REVISIONS 2/22/78 R.R. 8/9/78 R.M.
K.A. DURTSCH & ASSOCIATE
ENGINEERING-SURV
COEUR D ALENE, I

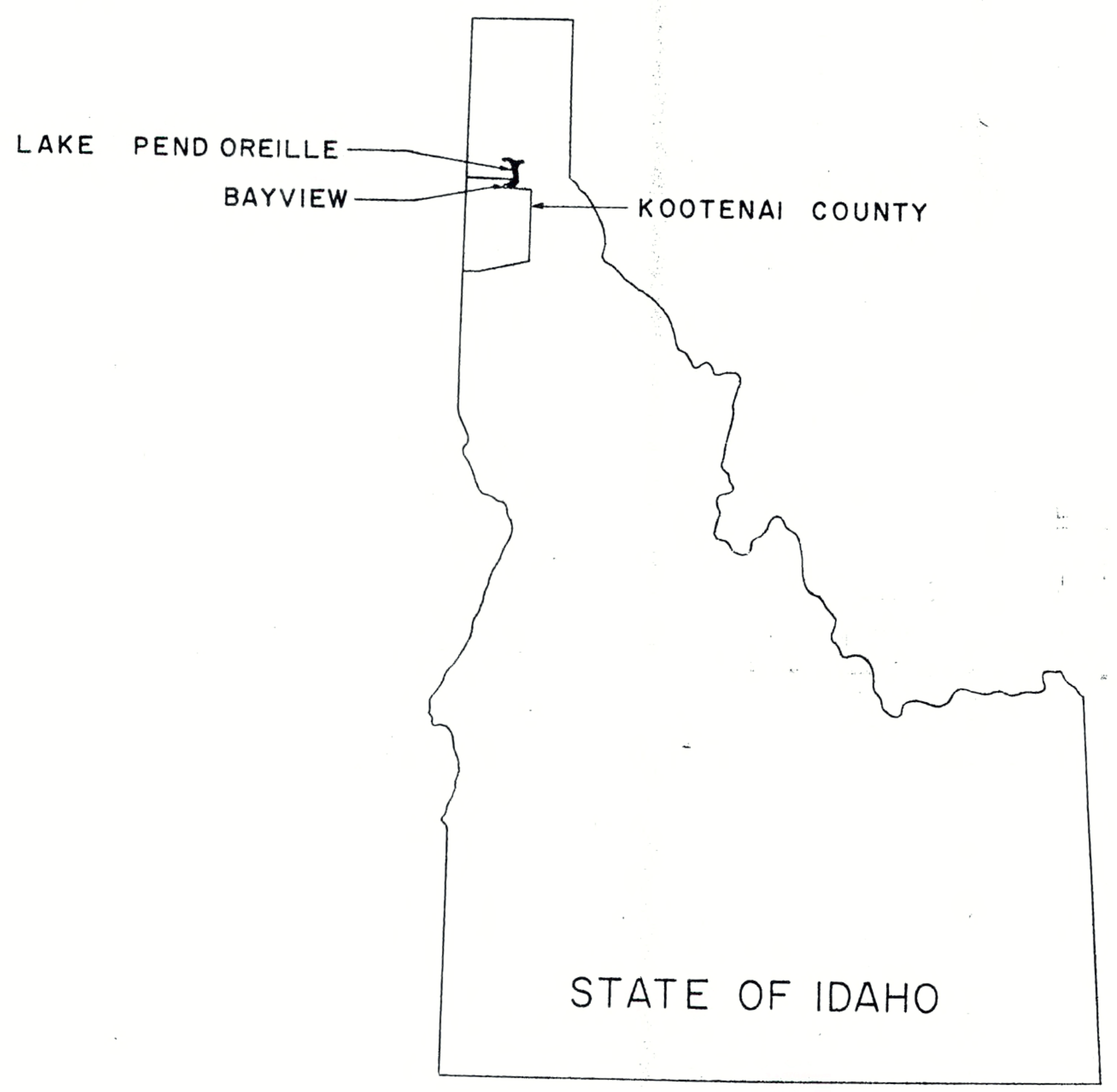

A 1 ea.
8"x8"x6"x6" HxHxFxF C.I. Cross
2" PVC "O" Ring Cpl.
2"x12" Galv. Nip. thd. x bevel
2"x11" C.I. Red. Flg.
6" H x F Gate Valve
2"x6" Galv. thd. Nipple
2" C.I. thd. Gate Valve
B 3 ea.
6"x6"x4" C.I. Red Tee HxHxF
4" HxF Gate Valve
C 4 ea.
4"x4" C.I. 90° ELL HxH
D 1 ea.
8" C.I. 45° ELL HxH
TT 6 ea.
6" C.I. 45° Hub ELL
E 1 ea.
4" HxF Gate Valve
6"x6"x4" HxHxF Tee
G 5 ea.
4" C.I. Hub Tee
4" PVC Cap (Glue)
H 10 ea.
4" PVC Cap (Glue)
Conc. Blocking 1½ sq.
I 12 ea.
2" PVC. Cap (Glue)
UU 1 ea.
2" Brass Gate Valve (No Valve Box)
8" PVC x 2" IPT Saddle
J 2 ea.
6"x6" C.I. 90° ELL HxH
K 1 ea.
6"x6"x6" C.I. Flg. Tee
6" HxF Gate Valve
6" C.I. HxF Adapt.
L 1 ea.
6" C.I. Flanged Cross
4" HxF Gate Valve
6"x4" C.I. Flg. Red.
6" C.I. HxF Adpt.
6" HxF Gate Valve
M 1 ea.
4" HxF Gate Valve
6" HxF Gate Valve
4"x4"x6" C.I. Flg. Tee
N 1 ea.
2"x9" C.I. Red. Flg.
2" Thd. Plug
4" HxF Gate Valve
8"x8"x4"x4" HxHxFxF C.I. Cross
O 1 ea.
8"x6"x8" C.I. Flanged Red. Tee
6" HxF Gate Valve
8" HxF Gate Valve
8" C.I. HxF Adpt.
P 1 ea.
2" PVC "O" Ring Cpl.
2"x12" Galv. Nipple thd x bevel
2" C.I. thd. Gate Valve
2"x6" Galv. Nipple
2"x11" C.I. Red. Flg.
4" C.I. Gate Valve FxH
6"x6"x4"x4" C.I. Flg. Cross
6" C.I. FxH Adapt.
Q 2 ea.
6" P.V.C. Cap (Glue)
6" C.I. Hub Tee
Conc. Block
R 15 ea.
To Fire Hyd. (See Appendix "I")
6" C.I. Tee HxHxH
S 1 ea.
4"x6"x6" C.I. Flanged Red Tee
6" C.I. HxF Adpt.
4" C.I. HxF Adpt.
6" HxF Gate Valve
T 3 ea.
8"x8"x6" C.I. Reducing Tee HxHxF
To Fire Hydrant (See Appendix I)
U 1 ea.
4" C.I. Tee HxHxF
4" C.I. Flg. 45° El
4" HxF Gate Valve
V 1 ea.
8"x8"x6" C.I. Red Tee HxHxF
6" HxF Gate Valve
6" C.I. 45° El HxH
8" P.V.C. Cap (GLUE)
W 1 ea.
6" C.I. Tap. Cpl. -2" IPT
2"x6" Galv. thd. Nipple
2" C.I. thd Gate Valve
2" PVC "O" Ring Cpl.
2"x12" Galv. Nip. thd x bevel
X 1 ea.
8" Compression Coupling 8" C.I. x 8" Steel
Existing 8" C.I.
Existing 8" C.I.
8"x8"x6" Epoxy Coated Steel Tee PExPExF
To Fire Hydrant (See App. I)
Y 1 ea.
6" HxF Gate Valve
6" C.I. HxF Adaptor
6" HxF Gate Valve
6" C.I. Flanged Tee
ZZ 1 ea.
8" C.I. 90° Hub ELL
AA 3 ea.
2"x6" thd. Galv. Nipple
2" C.I. thd. Gate Valve
2"x12" Galv. Nip. thd. x bevel
2" PVC "O" Ring Cpl.
4" C.I. Tap. Cpl. -2" IPT
BB 1 ea.
4"x6" C.I. Flanged Reducer
6" C.I. FxH Adaptor
4" C.I. Tee HxHxF
CC 5 ea.
6" To Fire Hydrant (See Appendix I)
6" C.I. Tee HxHxH
6"x4" C.I. Reducer Spigot x Hub
DD 2 ea.
8"x8"x6" Epoxy Coated Steel Tee PExPExF
6" FxH Gate Valve
Existing 8" C.I.
Existing 8" C.I.
8" Compression Coupling 8" C.I. x 8" Steel
EE 1 ea.
4" C.I. Hub Tee
2"x4" PVC. Reducer
FF 2 ea.
2" PVC "O" Ring Cpl.
2"x12" Galv. Nip. thd. x bevel
2"x6" Galv. thd. Nipple
4" C.I. Plug tapped 2" IPT w/ Ret. Ring
4" C.I. Hub Tee
2" C.I. Thd. Gate Valve
YY 2 ea.
8" C.I. 22½° Hub ELL
GG 4 ea.
6" FxH Gate Valve
6" C.I. Tee HxHxF
HH 1 ea.
6" PVC. Cap (Glue)
6"x6"x4" C.I. Hub Tee
6" C.I. HxF Gate Valve
6"x4"x6" C.I. Flg Tee
6" HxF Adaptor
VV 1 ea.
JJ 2 ea.
2" Dresser Coupling
2" Brass Gate Valve (No Valve Box)
6" PVC. x 2" IPT Saddle
XX 3 ea.
2" PVC. O-ring 90° ELL
KK 3 ea.
4" C.I. Hub 45° El.
LL 1 ea.
4" HxF Gate Valve
6" HxF C.I. Adapt.
6" HxF Gate Valve
6"x4"x6" C.I. Flg Tee
MM 1 ea.
6" PVC Cap (Glue)
6" C.I. Tee HxHxF
6" HxF Gate Valve
NN 1 ea.
8" Compression Coupling 8" C.I. x 8" Steel
8" Epoxy Coated Steel Tee PExPExF
Exist 8" C.I.
Exist 8" C.I.
8" FxH Gate Valve
QQ 2 ea.
6"x6"x4" C.I. Tee All Hub
RR 1 ea.
6"x6"x4"x4" HxHxFxF C.I. Cross
4" Blind Flange
4" HxF Gate Valves
SS 3 ea.
4" C.I. Hub Tee
WW 1 ea.
6" PVC. Cap (Glue)
AS BUILT
DOMESTIC WATER SYSTEM
PIPING DETAILS
DRAWN BY J.W.S.
CHECKED BY E.E.S.
REVISIONS 8/1/78 R.M.
FOR BAYVIEW WATER & SEWER DISTRICT
K.A. DURTSCHI & ASSOCIATES
ENGINEERING—SURVEYING
COEUR D ALENE, IDAHO

DROMORE ADDITION

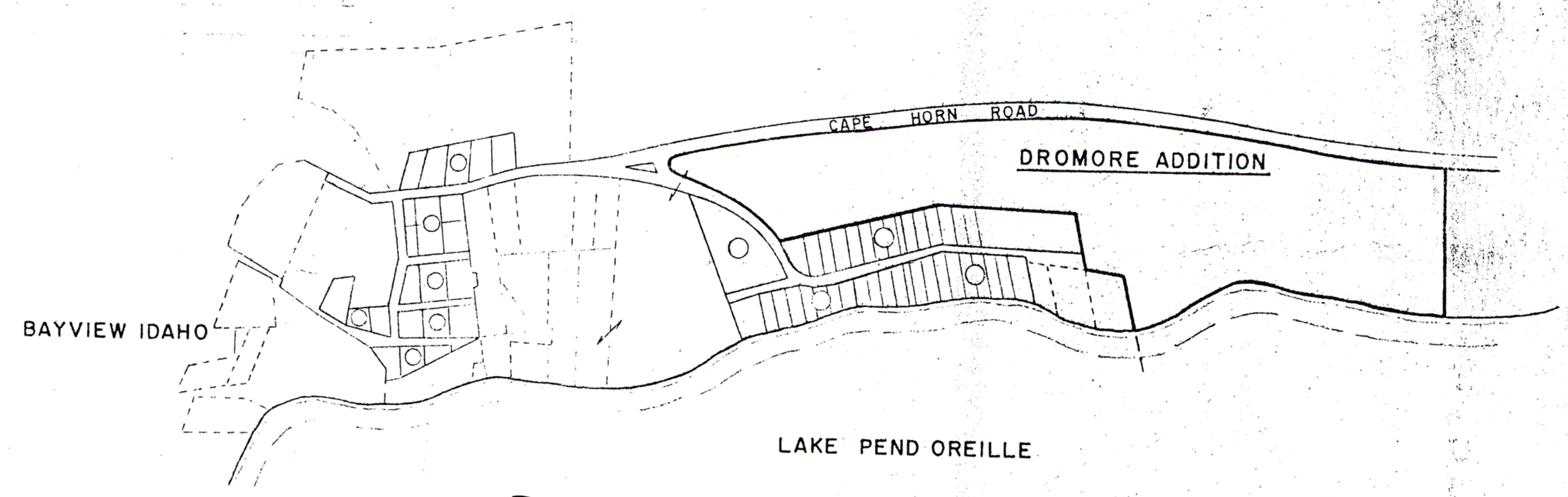
BAYVIEW, IDAHO

1978

K



LOCATION MAP
NOT TO SCALE



VICINITY MAP
1" = 400'

PARTIAL
As-Built* does not include drainfield as-builts.

PLANS & SPECIFICATIONS REVIEW

By: Gary Gaffney
Environmental Engineer

These plans and/or specifications have been reviewed for compliance with **Idaho Dept. of Health and Welfare** regulations. This review does not relieve the owner, engineer, or the contractor of the responsibility to design or construct these facilities in compliance with all current applicable federal, state and local laws, rules, regulations, or ordinances.

Date: 11/18/81

Plans and/or specifications must be resubmitted for review if construction is not initiated on or before: N/A

Refer to letter of 11/18/81 to Richard Hansen

* with conditions

PLANS & SPECIFICATIONS REVIEW

By: Gary Gaffney
Environmental Engineer

These plans and/or specifications have been reviewed for compliance with **Idaho Dept. of Health and Welfare** regulations. This review does not relieve the owner, engineer, or the contractor of the responsibility to design or construct these facilities in compliance with all current applicable federal, state and local laws, rules, regulations, or ordinances.

Date: November 29, 1979

Plans and/or specifications must be resubmitted for review if construction is not initiated on or before: November 29, 1980

Refer to letter of 11-29-79 to B. Meckel

Contingencies
① O & M agreements for water and sewer
② O/M manual for sewer with as-builts

AS-BUILT
11/16/81
Brian D. Meckel, PE
2441

PROFESSIONAL ENGINEER · LAND SURVEYOR · REGISTERED · 2441 · 11/16/81 · STATE OF IDAHO · BRIAN D. MECKEL

RECEIVED
OCT 22 1979
DIVISION OF ENVIRONMENT
COEUR D'ALENE OFFICE

APPROVED
FOR CONSTRUCTION
BY BDM DATE 10/22/79

REGISTERED PROFESSIONAL ENGINEER · 2441 · 7/16/79 · STATE OF IDAHO · BRIAN D. MECKEL

#945
RECEIVED
NOV 16 1981
DIVISION OF ENVIRONMENT
COEUR D'ALENE OFFICE

SHEET INDEX

SHT. NO	TITLE	SHT. NO	TITLE	SHT. NO	TITLE
1	COVER SHEET	9	PLAN & PROFILE WATER LINES A&B	13	SEWER SYSTEM PLAN LAYOUT
2	STANDARD ABBREVIATIONS				
3	SPECIFICATIONS - WATER	10	PLAN & PROFILE WATER LINES C&D	14	SEWER SYSTEM DETAIL & NOTES
4	TOPOGRAPHIC MAP			15	SEWAGE TREATMENT PLAN
5	PLAN LAYOUT OF WATER SYSTEM	11	TANK SITE PLAN	16	DETAILS - SEWAGE
6	STANDARD WATER DETAILS				
7	STANDARD WATER DETAILS	12	TANK AND PUMP STATION DETAILS		
8	PLAN & PROFILE WATER LINE E				

NO.	DATE	REVISIONS	BY	APPR
△				
△				
△				
△				
△				

DES.	DR.	CHK.	APPD.	DATE
	C.E.P.		BDM	6/14/78

DROMORE ADDITION
BAYVIEW IDAHO

COVER SHEET

WK
WINZLER & KELLY
CONSULTING ENGINEERS
Brian D. Meckel 2441

JOB NO. 77-505
SHEET 1 OF 16

Dromore O-12
Allen. Bayview - O-12

NOTE:
SHADED LOTS MAY REQUIRE INDIVIDUAL PRESSURE REDUCERS.
DEPENDING ON ELEVATION OF THE HOUSE IN THE LOT

THIS PLAN REPRESENTS THE AS-BUILT WATER SYSTEM
Brian D. Meckel 11/16/81
AIR VAC VALVE MOVED
X BLOW OFF VALVES NOT INSTALLED

PROFESSIONAL ENGINEER REGISTERED SURVEYOR 2441 11/16/81 STATE OF IDAHO BRIAN D. MECKEL

REGISTERED PROFESSIONAL ENGINEER 2441 7/3/78 STATE OF IDAHO BRIAN D. MECKEL

APPROVED FOR CONSTRUCTION
BY ________ DATE OCT 22 1979

DROMORE ADDITION

BAYVIEW IDAHO

WATER SYSTEM PLAN LAYOUT

NO.	DATE	REVISIONS	BY	APPR
△				
△				
△				
△				
△				

SCALE	DR.	CHK.	APPD.	DATE
1" = 100'	C.E.P	KBS	BLM	10/15/79

WINZLER & KELLY
CONSULTING ENGINEERS
Brian D. Meckel 2441

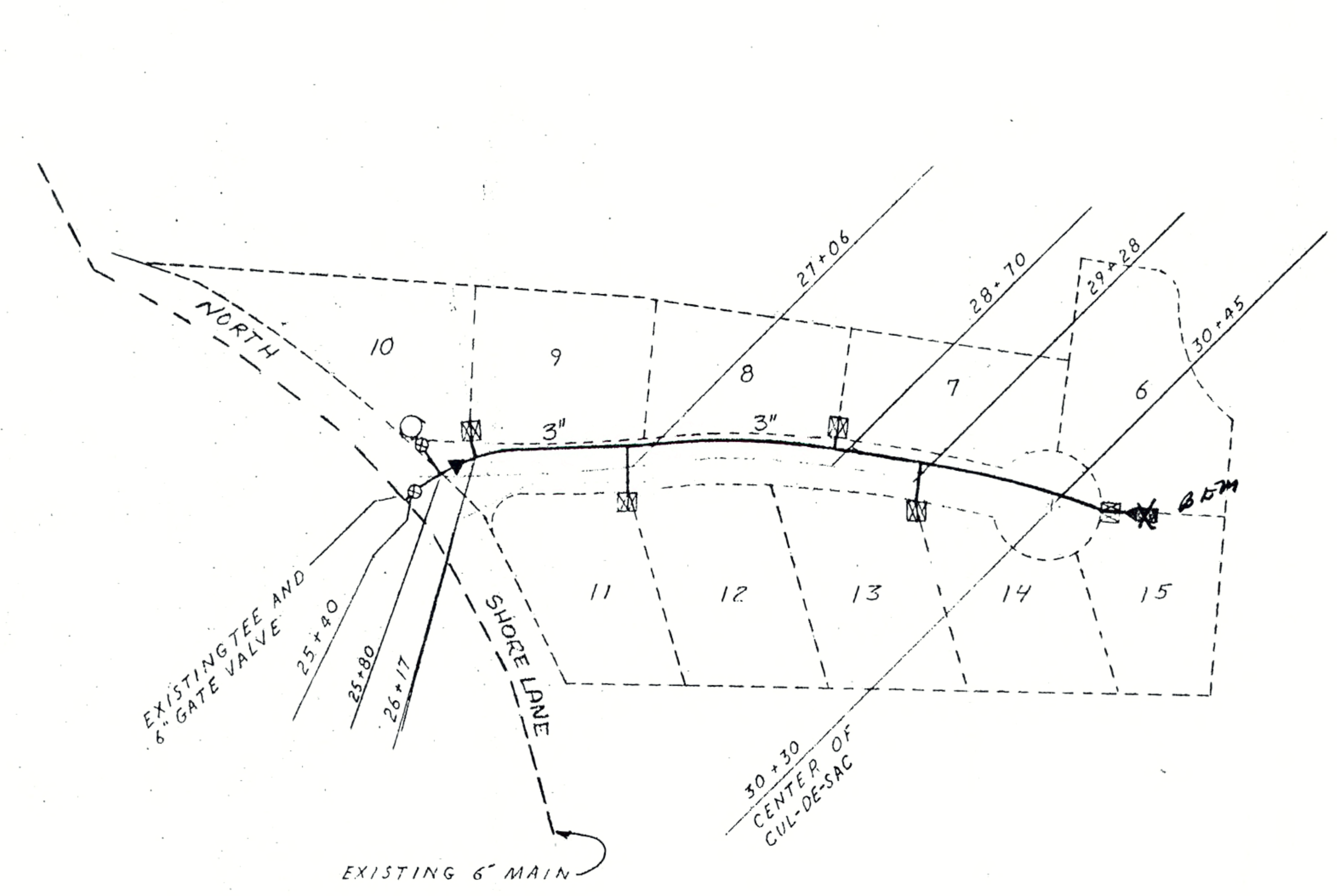
JOB NO. 77-505
SHEET 5 OF 16

CAMPBELL COPY CO., PORTLAND, OR.

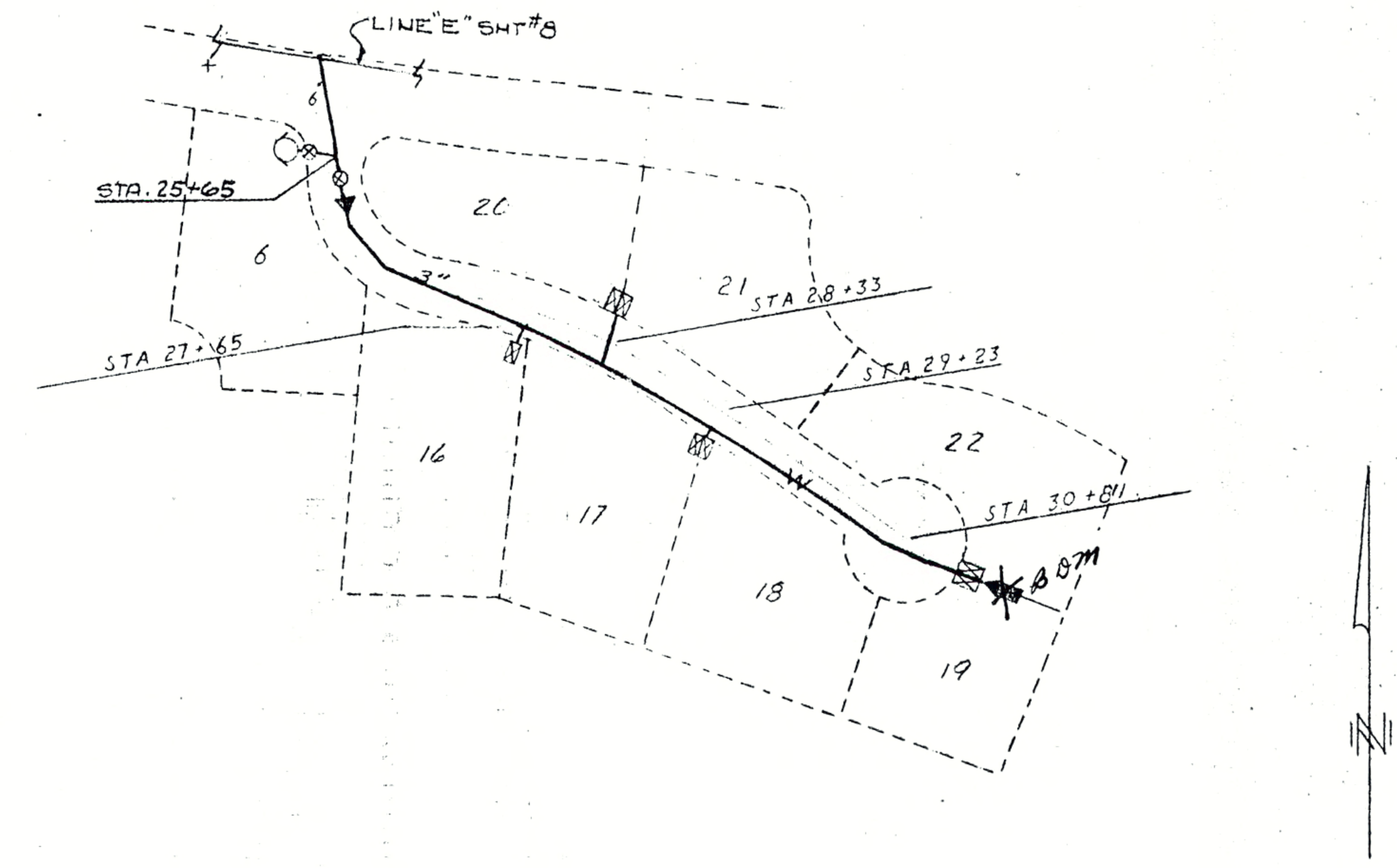
Existing Pump House
PROPERTY LINE
STA 10+00
STA 12+00
STA 16+49
STA 20+30
STA 23+38
STA 25+87
STA 34+38 APPROX
4"
W
CAPE
HORN
ROAD
600' To Water Tank
INSTALL AIR/VAC VALVE AT HIGH POINT MOVED TO HIGH POINT IN LINE D. BDM
LINE "E"
LINE "D"
B PAGE 9
C PAGE 10
D PG. 10
NOTES
1. ALL MEASUREMENTS ARE APPROXIMATE ACTUAL LOCATIONS TO BE MADE IN FIELD
2. WATER SYSTEM REFERENCED TO CENTER OF ROAD STATIONING
3. MIN BEND RADIUS
2½" AT 200'
6" AT 1000'
CAPE HORN ROAD LINE E
SCALE : 1" = 100'
PLAN
NOTE BOOK
No.
SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
BY
DATE
PROFILE
GRADES CHECKED
B. M.'s NOTED
STRUCTURE NOTATIONS CHECKED
2335
2315
2295
2275
2255
2235
2215
2195
2175
STA 10+00 INSTALL 90° ELBOW TO PUMP HOUSE
STA 12+00 INSTALL 45° ELBOW
STA 20+30 INSTALL DOUBLE SERVICE
STA 23+38 INSTALL 6"x6"x6" TEE WITH VALVE CLUSTER AND INCREASE PIPE TO 6" INSTALL REDUCING DEVICE
STA 25+87 INSTALL 6"x4" TEE
STA 34+38 INSTALL AIR/VAC VALVE
LINE "E" LINE "D" PAGE 10
6"
4"
THIS PLAN REPRESENTS THE AS-BUILT WATER SYSTEM
Brian D. Meckel 11/16/81
AIR VAC VALVE RELOCATED.
APPROVED FOR CONSTRUCTION
BY. DATE OCT 22 1979
REGISTERED PROFESSIONAL ENGINEER
2441
11/16/81
STATE OF IDAHO
BRIAN D. MECKEL
35+00
10+00
15+00
20+00
25+00
30+00
DROMORE ADDITION
WATER SYSTEM
LINE E
NO.
DATE
REVISIONS
BY
APPR.
DES.
DR.
CHK.
APPD.
DATE
C.E.F.
B.D.M.
10/15/79
WINZLER & KELLY
CONSULTING ENGINEERS
JOB NO. 77-505
SHEET 8 OF 16

NOTES:

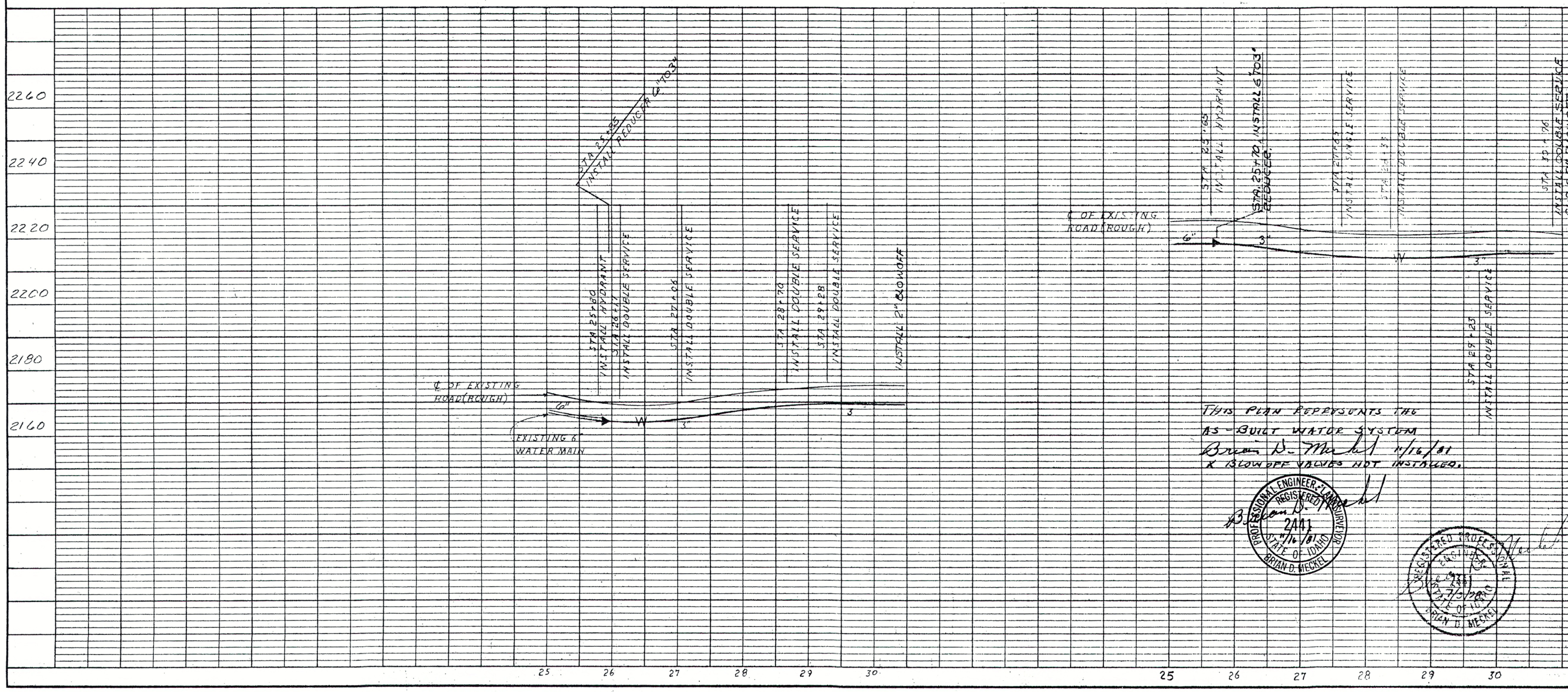
1. ALL MEASUREMENTS ARE APPROXIMATE ACTUAL LOCATIONS TO BE MADE IN FIELD
2. WATER SYSTEM REFERENCED TO CENTER OF ROAD STATIONING
3. MIN. BEND RADIUS:
   3" AT 200'
   2½ AT 200'



LINE "A"
SCALE: 1"=100'



LINE "B"
SCALE: 1"=100'



THIS PLAN REPRESENTS THE AS-BUILT WATER SYSTEM
Brian D. Meckel 11/16/81
X BLOWOFF VALVES NOT INSTALLED.

PROFESSIONAL ENGINEER & LAND SURVEYOR REGISTERED 2441 11/16/81 STATE OF IDAHO BRIAN D. MECKEL

REGISTERED PROFESSIONAL ENGINEER 2441 STATE OF IDAHO BRIAN D. MECKEL

APPROVED FOR CONSTRUCTION
BY ________ DATE OCT 22 1979

PLAN — NOTE BOOK — No. — SURVEYED — PLOTTED — ALIGNMENT CHECKED — RT. OF WAY CHECKED — BY — DATE

PROFILE — NOTE BOOK — No. — SURVEYED — PLOTTED — GRADES CHECKED — B. M.'S NOTED — STRUCTURE NOTATIONS CHECKED — BY — DATE

DROMORE ADDITION
BAYVIEW IDAHO

WATER SYSTEM
LINE "A" & LINE "B"

NO.	DATE	REVISIONS	BY	APPR
△				
△				
△				
△				
△				

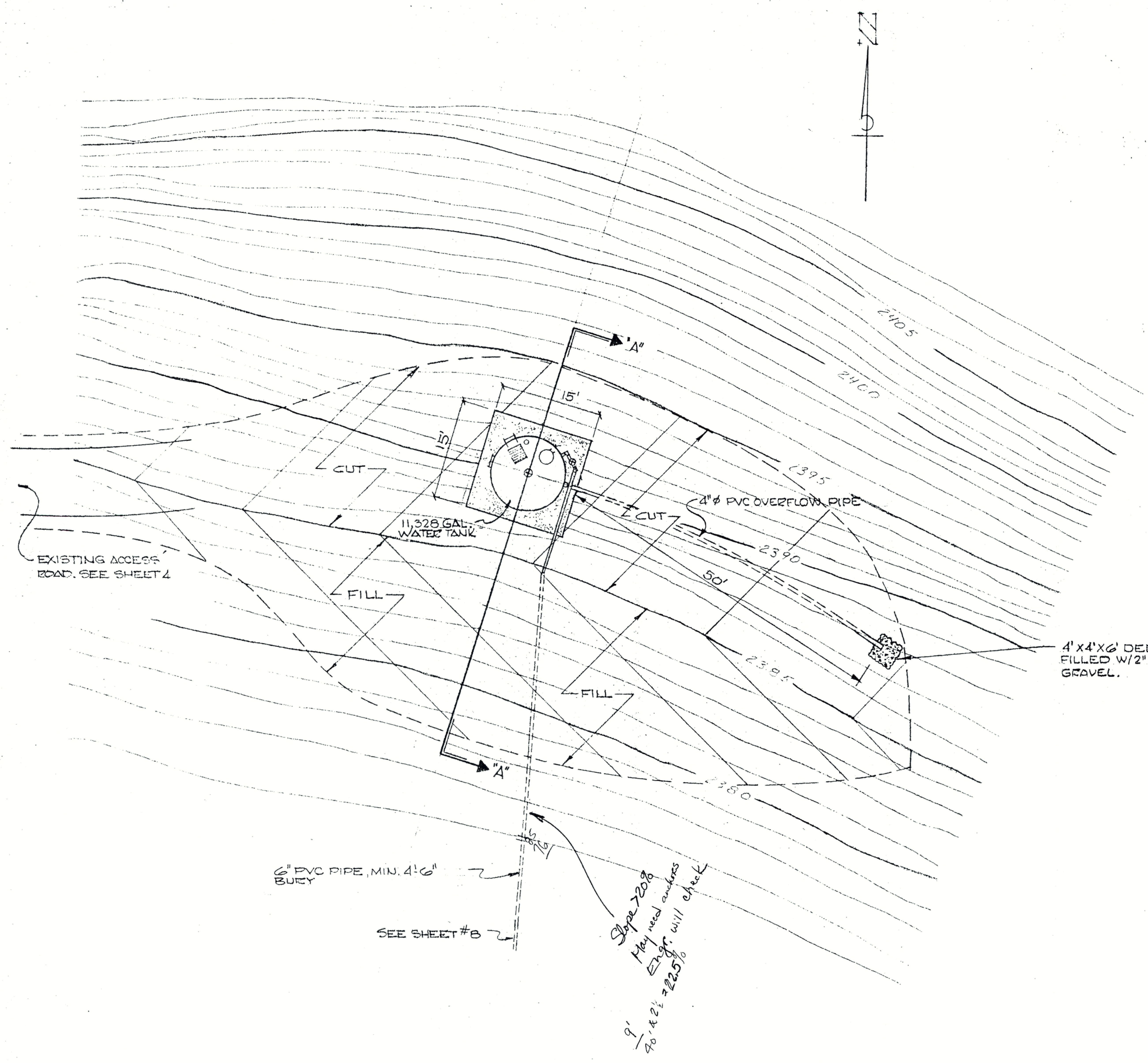
DES.	DR.	CHK.	APPD.	DATE
GWL	C.E.P.		BDM	10/15/79

WINZLER & KELLY
CONSULTING ENGINEERS
Brian D. Meckel 2441
2201 GOVERNMENT WAY COEUR D'ALENE, ID (208) 667-9687

JOB NO. 77-505
SHEET 9 OF 16

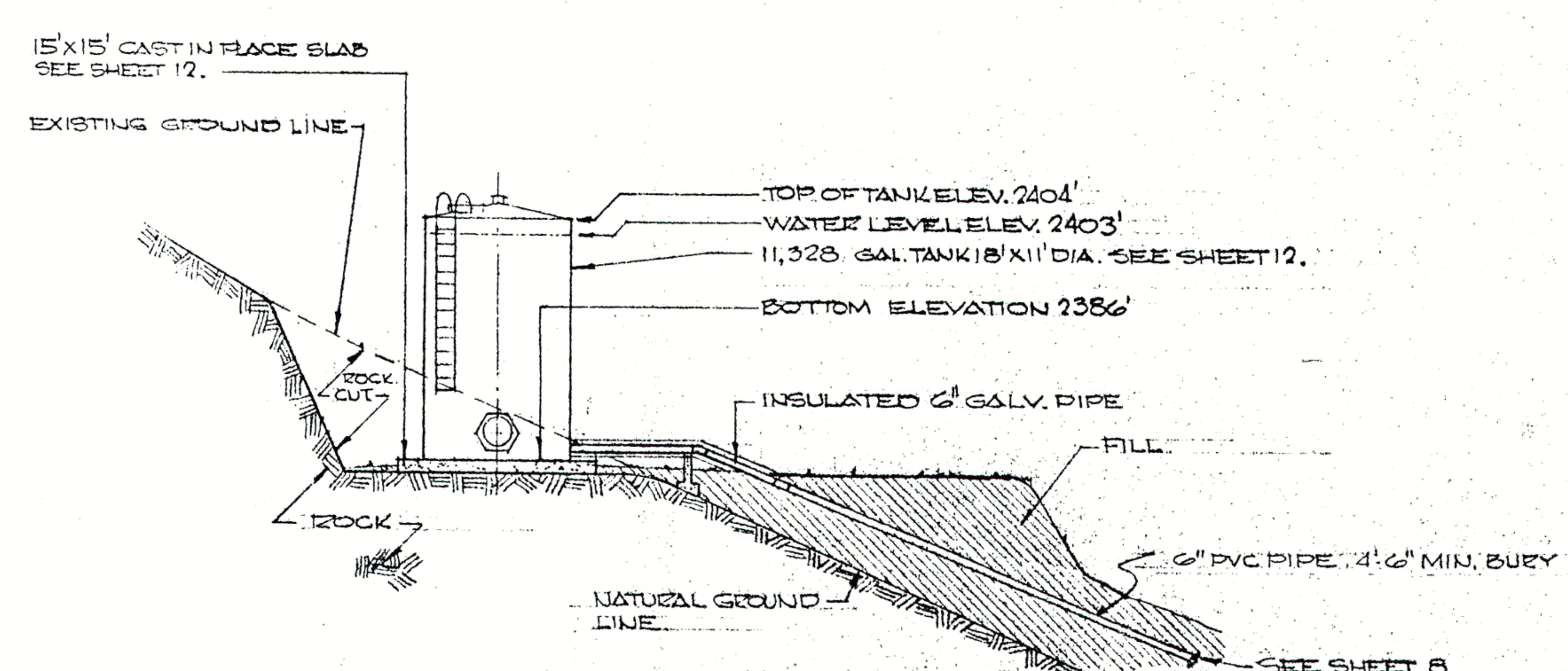
K+E PLATE 1, PLAN-PROFILE KEUFFEL & ESSER CO.
48 7008 MADE IN U.S.A.

NOTES:
1. ALL MEASUREMENTS ARE APPROXIMATE ACTUAL LOCATIONS TO BE MADE IN FIELD
2. WATER SYSTEM REFERENCED TO CENTER OF ROAD STATIONING
3. MIN. BEND RADIUS: 3" AT 200' 2 1/2" AT 200'
LINE "C"
SCALE: 1"=100'
LINE "D"
SCALE: 1"=100'
STA 25+37
STA 25+85
STA 28+16
STA 28+90
STA 29+70
STA 29+90
STA 30+10 CENTER OF CUL-DE-SAC
ELBOW AS REQUIRE
LINE "E"
LINE "D"
STA 19+45
STA 22+87
STA 25+05
STA 25+95
STA 29+27
STA 30+55 CENTER OF CUL DE SAC
CAPE HORN ROAD
AIR VAC VALVE RELOCATED TO HIGH POINT IN LINE "D" BDM
STA 25+37 INSTALL DOUBLE SERVICE & 2" BLOWOFF VALVE
STA 25+85 INSTALL DOUBLE SERVICE
STA 28+16 INSTALL 3"x3"x3" TEE AND LAY PIPE WITH APPURTENANCES AS INDICATED TO D LINE
STA 29+70 INSTALL SINGLE SERVICE
STA 28+90 INSTALL A DOUBLE SERVICE CONNECTION
STA 29+70 INSTALL DOUBLE SERVICE AND 2" BLOWOFF VALVE
STA 19+45 INSTALL 6"x3" TEE AND LAY PIPE WITH APPURTENANCES AS INDICATED TO C LINE
STA 22+87 INSTALL DOUBLE SERVICE CONNECTION
AT HIGH POINT INSTALL AIRVAC ASSEMBLY AND 6"x3" REDUCER
STA 25+95 INSTALL DOUBLE SERVICE
STA 26+95 INSTALL SINGLE SERVICE
STA 29+27 INSTALL DOUBLE SERVICE & 2" BLOWOFF VALVE
LINE "E" LINE "D"
THIS PLAN REPRESENTS THE AS BUILT WATER SYSTEM. AIR VAC VALVE RELOCATED BLOW OFF VALVES NOT INSTALLED.
Brian D. Meckel 11/16/81
APPROVED FOR CONSTRUCTION
BY DATE OCT 22 1979
REGISTERED PROFESSIONAL ENGINEER 2441 STATE OF IDAHO BRIAN D. MECKEL
DROMORE ADDITION
BAYVIEW, IDAHO
WATER SYSTEM
LINE "C" & LINE "D"
NO. DATE REVISIONS BY APPR
DES. DR. CHK. APPD. DATE
CEP BDM 10/15/79
WINZLER & KELLY
CONSULTING ENGINEERS
2201 GOVERNMENT WAY COEUR D'ALENE, ID.
JOB NO. 77-505
SHEET 10 OF 16
PLAN
NOTE BOOK
PROFILE
K+E PLATE 1, PLAN-PROFILE KEUFFEL & ESSER CO.
48 7008 MADE IN U.S.A.



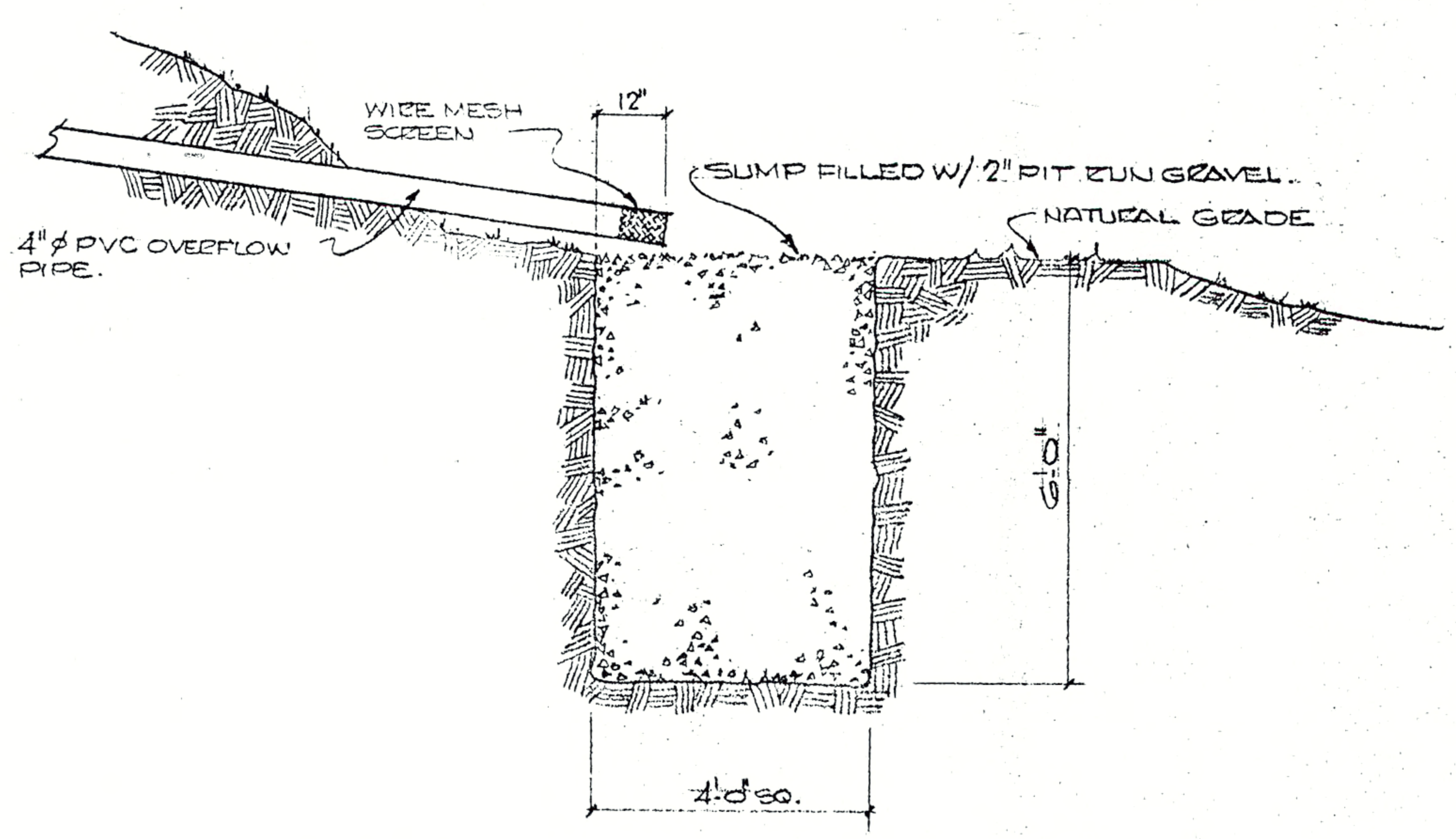
TANK SITE TOPOGRAPHY

1" = 10'-0" 1' CONTOUR INTERVAL



A/11 SECTION "A-A" (SEE DETAILED DRAWINGS ON SHEET 12)

SCALE: 1" = 10'



SUMP FOR OVERFLOW DRAIN

(1/2" = 1'-0")

THIS PLAN REPRESENTS THE AS-BUILT WATER SYSTEM.
Brian D. Meckel 11/16/81

APPROVED FOR CONSTRUCTION
BY________ DATE OCT 22 1979

PROFESSIONAL ENGINEER - LAND SURVEYOR REGISTERED 2441 11/16/81 STATE OF IDAHO BRIAN D. MECKEL

REGISTERED PROFESSIONAL ENGINEER 2441 11/16/81 STATE OF IDAHO BRIAN D. MECKEL

NO.	DATE	REVISIONS	BY	APPR
△				
△				
△				
△				
△				

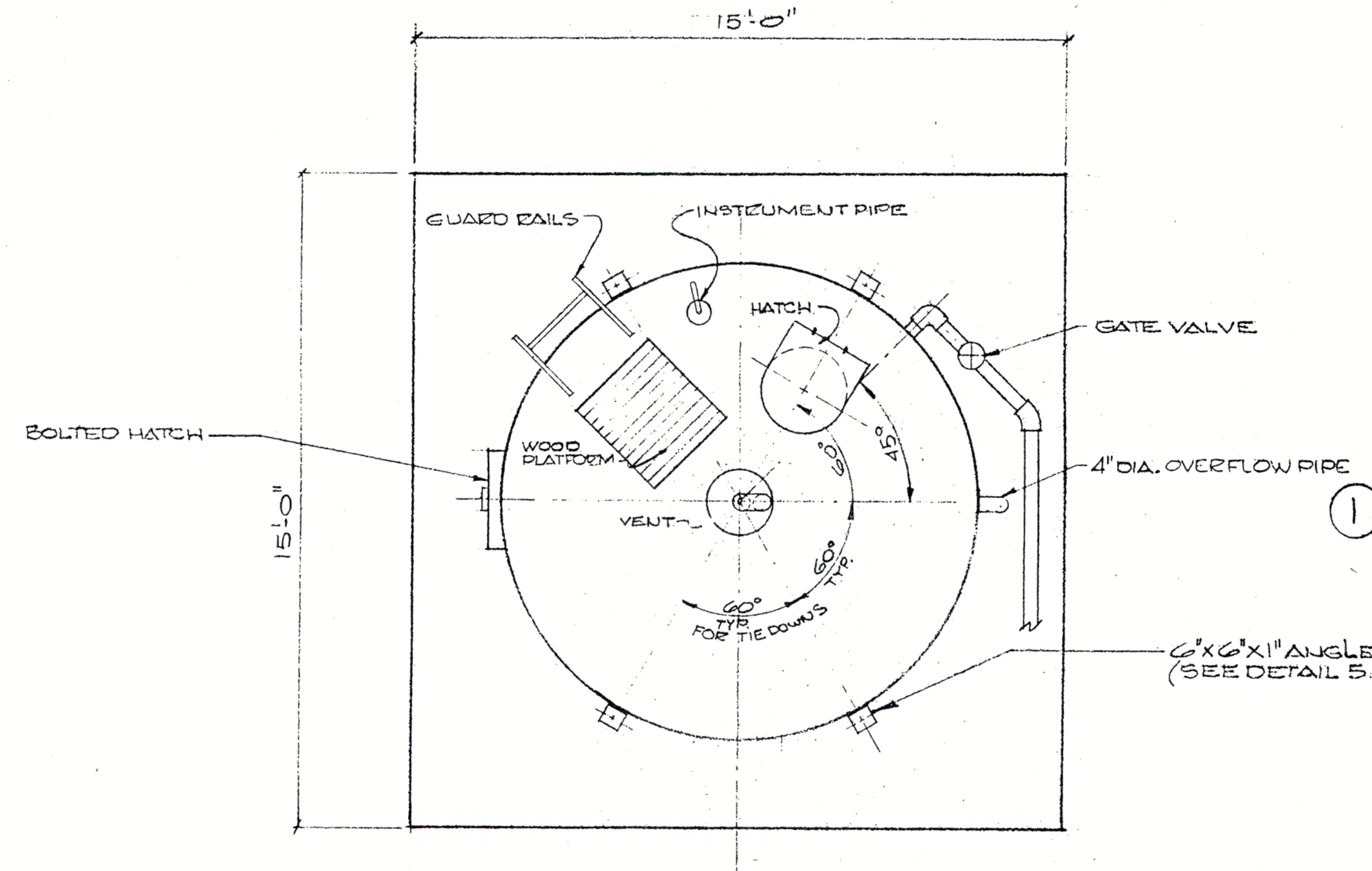
DES.	DR.	CHK.	APPD.	DATE
JAS	KAFOL	KBS	[illegible]	10/15/79

DROMORE ADDITION
BAYVIEW IDAHO

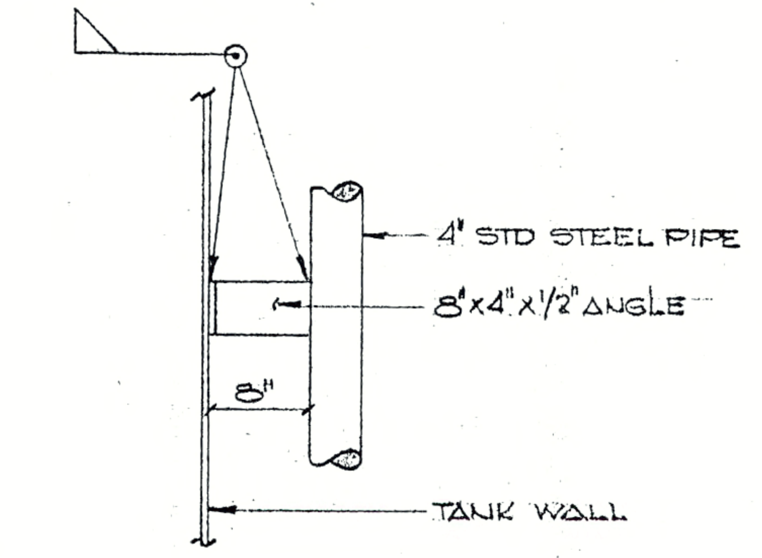
TANK SITE PLAN

WINZLER & KELLY
CONSULTING ENGINEERS
Brian D. Meckel 2441
2201 GOVERNMENT WAY, COEUR D'ALENE, IDAHO

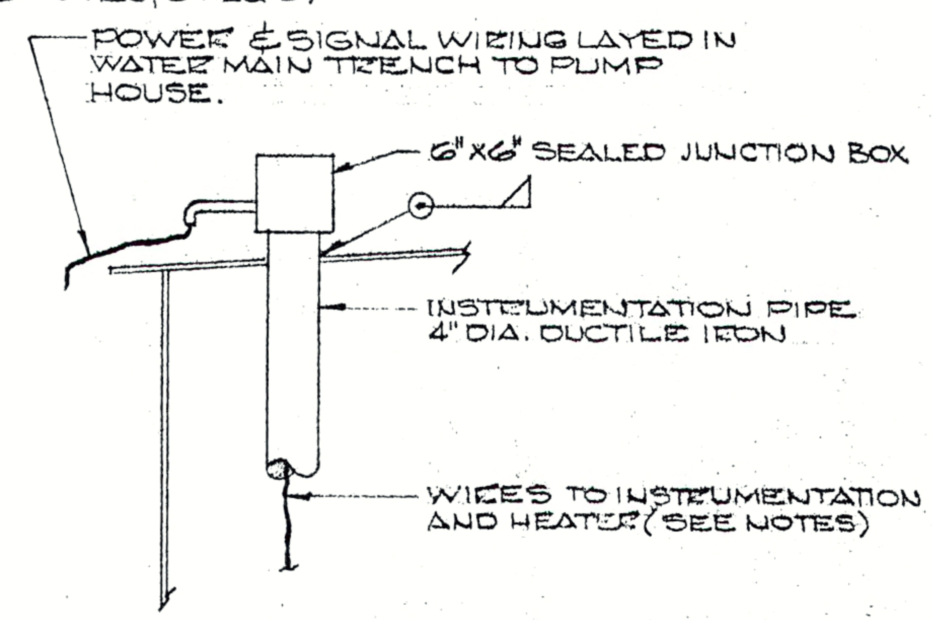
JOB NO. 77-505
SHEET 11 OF 16



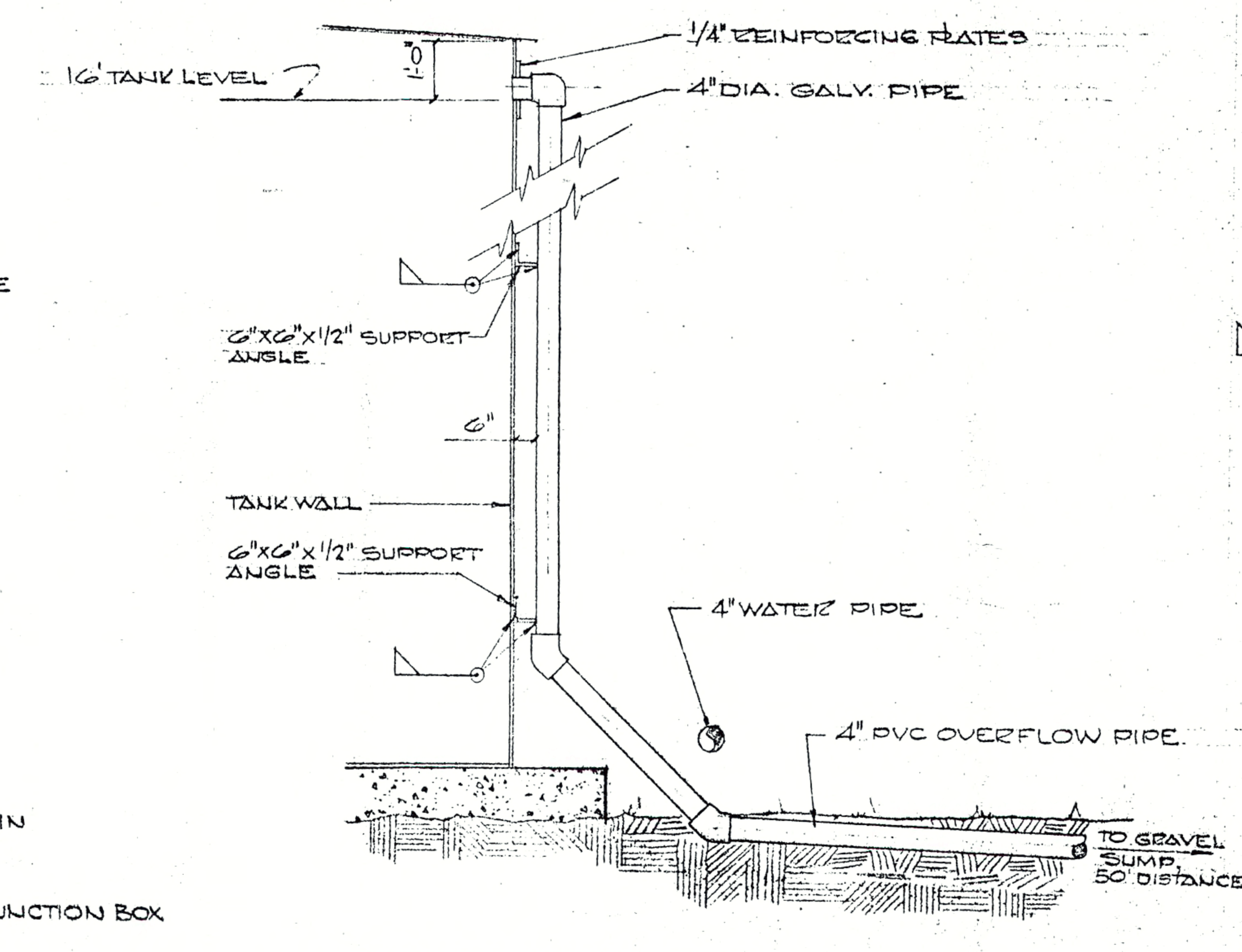
PLAN VIEW OF WATER TANK
(3/8"=1'-0")



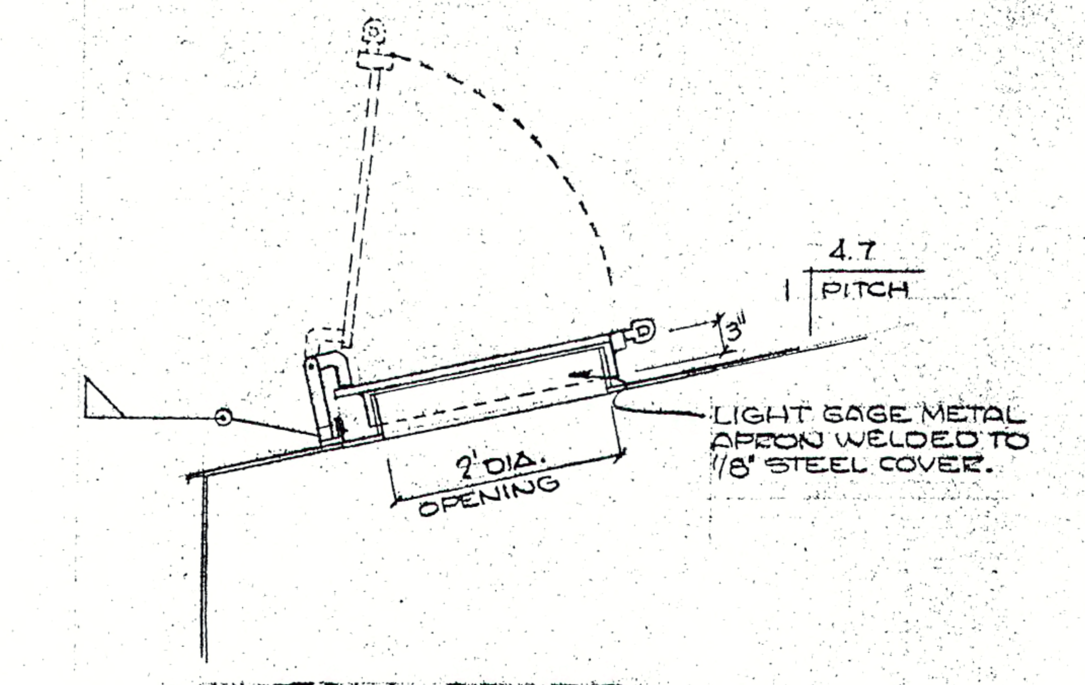
① TYPICAL INSTRUMENT PIPE BRACING DETAIL
(1"=1'-0")



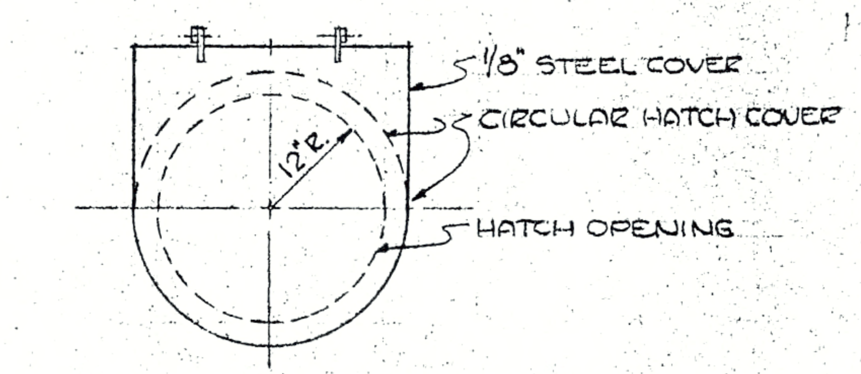
④ INSTRUMENTATION SET-UP
(1"=1'-0")



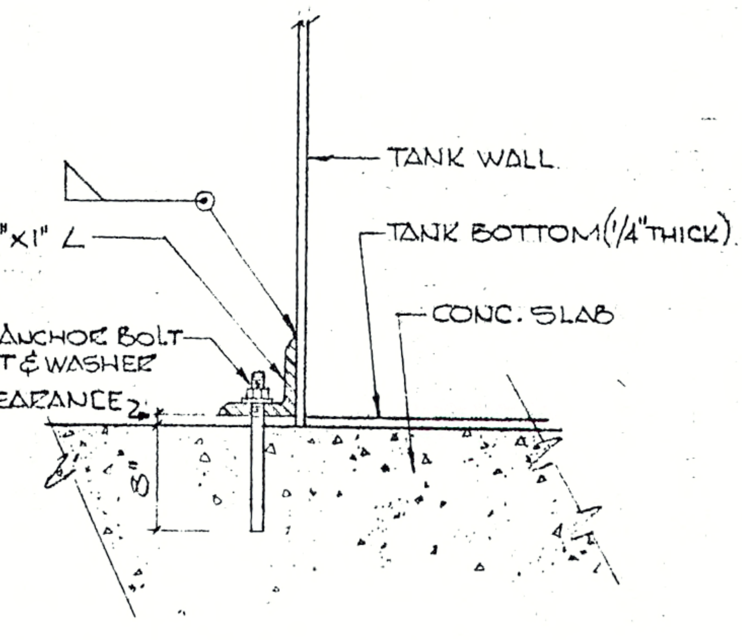
② DRAIN PIPE DETAIL
(3/8"=1'-0")



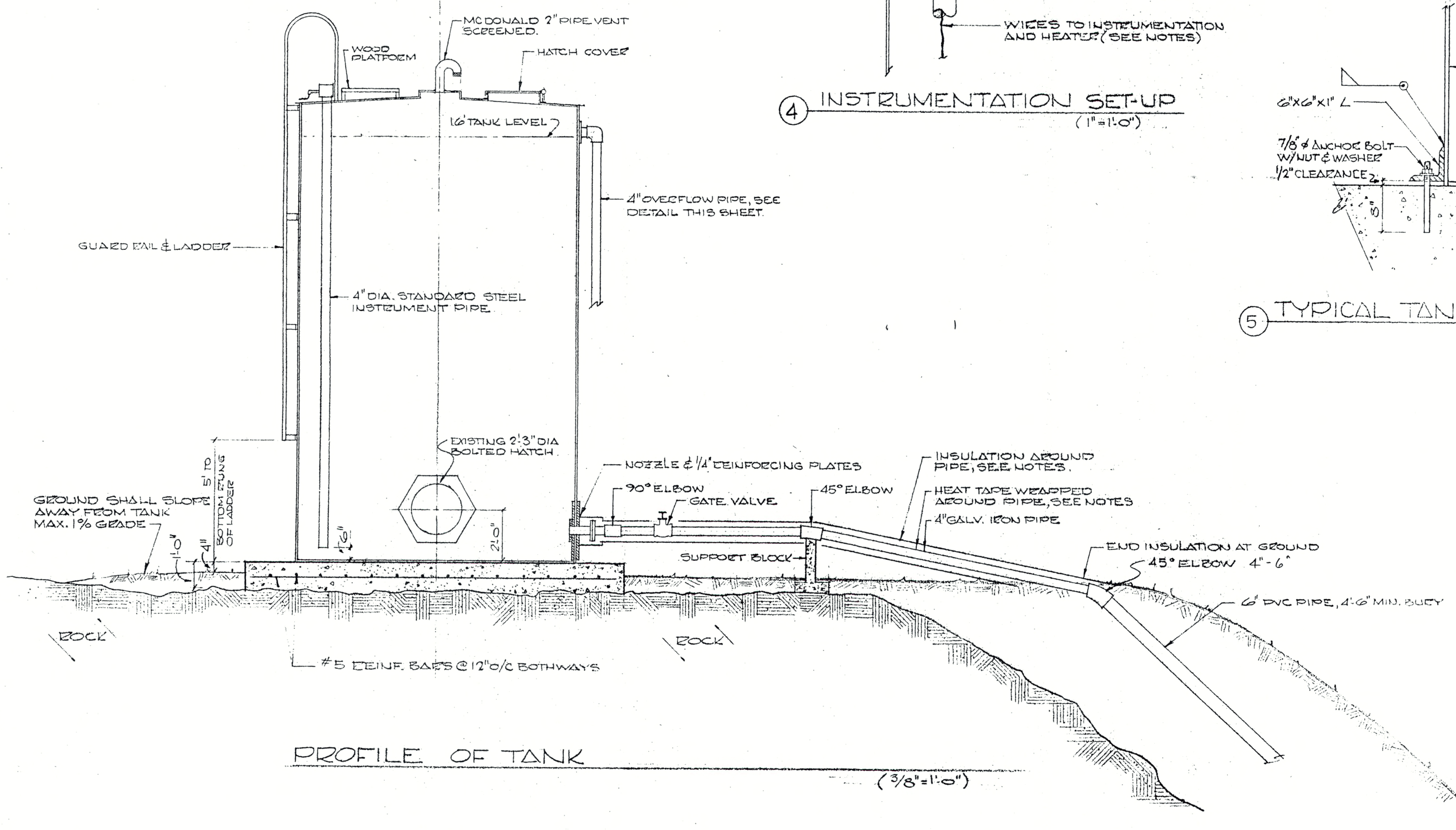
③ HATCH COVER
(3/4"=1'-0")



TOP VIEW OF COVER
(3/4"=1'-0")



⑤ TYPICAL TANK TIE DOWN
(1"=1'-0")



PROFILE OF TANK
(3/8"=1'-0")

NOTES:

1. ALL PIPE EXPOSED TO WEATHER SHALL BE GALVANIZED IRON WRAPPED IN INSULATION WITH SEALED ALUMINUM JACKET.
2. ALUMINUM JACKET SHALL BE 28 GA. MINIMUM.
3. CONCRETE SLAB SHALL BE CAST IN PLACE AGAINST ROCK FACE. 28 DAY CONCRETE STRENGTH SHALL BE 3000PSI.
4. TANK SHALL BE A 11 FT. DIA. X 18 FT. HIGH USED STEEL TANK W/A MAX. STORAGE CAPACITY OF 11,328 GALLONS.
5. TANK INSIDE SHALL BE SANDBLASTED AND PAINTED W/AN AWWA APPROVED PAINT.
6. PROVIDE 2" PIT RUN GRAVEL SUMP AT END OF OVERFLOW PIPE TO PREVENT EROSION. SEE DETAIL.
7. ANCHOR BOLTS AND TIE DOWN ANGLES SHALL BE ASTM A-36 STEEL. TANK TIE DOWNS SHALL BE EQUALLY SPACED. 6 REQ'D. AROUND PERIMETER OF TANK.
8. CONCRETE SLAB REINFORCEMENT SHALL BE ASTM A-615, GRADE 40 DEFORMED BARS.
9. TANK INSTRUMENTATION SHALL BE STAINLESS STEEL PROBES. PUMP TO SWITCH ON AT 11' LEVEL & TO SWITCH OFF AT 16' LEVEL OF WATER ABOVE THE TANK FLOOR.
10. A HEATER SHALL BE INSTALLED IN THE INSTRUMENTATION PIPE TO PREVENT WATER FROM FREEZING. HEATER SHALL BE 350 WATTS MINIMUM.
11. INSTRUMENTATION PIPE SHALL BE SUPPORTED AT ITS QUARTER POINTS.
12. INSULATION SHALL HAVE A "K" VALUE OF .36 BTU/HR. PER DEG. F PER 1" THICKNESS.
13. POWER FOR HEAT TAPE SHALL BE #12 UTILITY ON-OFF SWITCH SHALL BE A FILLED BULB CONTROL INSERTED IN THE WATER LINE, SET POINT AT 40°F. CHEMELEX OR EQUAL.
14. HEAT TRACER TAPE SHALL BE WRAPPED AROUND GALV. IRON PIPE & BE CAPABLE OF 4 WATTS PER FOOT.

$\Delta V = 7.48(5')(10')^2 \frac{\pi}{4}$ = 2937 gallons

THIS PLAN REPRESENTS THE AS-BUILT WATER SYSTEM
Brian D. Meckel 11/16/81

PROFESSIONAL ENGINEER · LAND SURVEYOR REGISTERED 2441 STATE OF IDAHO BRIAN D. MECKEL

APPROVED FOR CONSTRUCTION
BY ________ DATE OCT 22 1979

DROMORE ADDITION
BAYVIEW, IDAHO

STORAGE TANK

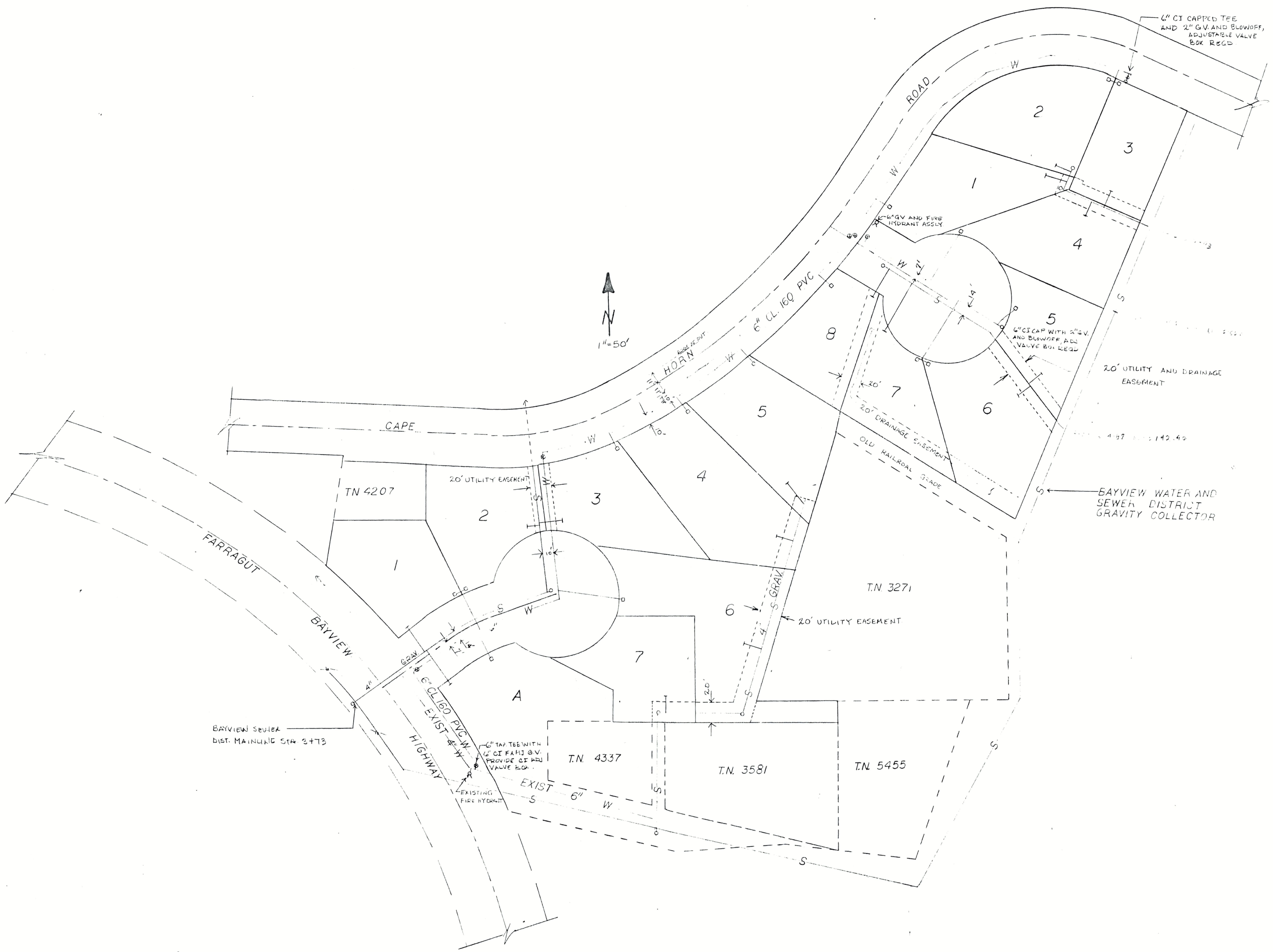
NO.	DATE	REVISIONS	BY	APPR
△				
△				
△				
△				
△				

DES.	DR.	CHK.	APPD.	DATE
JAS	CRKAROL	KBS	BDM	10/15/79

WINZLER & KELLY
CONSULTING ENGINEERS
Brian D. Meckel 2441
2201 GOVERNMENT WAY, COEUR D'ALENE, IDAHO

JOB NO. 77-505
SHEET 12 OF 16

SUMMER COVE – UTILITIES PLAN



Summer Cove

KEY

—S—	Sanitary Sewer
—W—	Water
○	Sanitary Sewer Cleanout
⊗	Gate Valve
Fire Hydrant	
□	Water Service Meter Box
⊢	Sanitary Sewer Service Stub
○○	Drywell/Catch Basin
○	2" Blowoff
Traffic Signage	

REGISTERED PROFESSIONAL ENGINEER 5234 9/28/90 STATE OF IDAHO STEVEN J. SEITZ

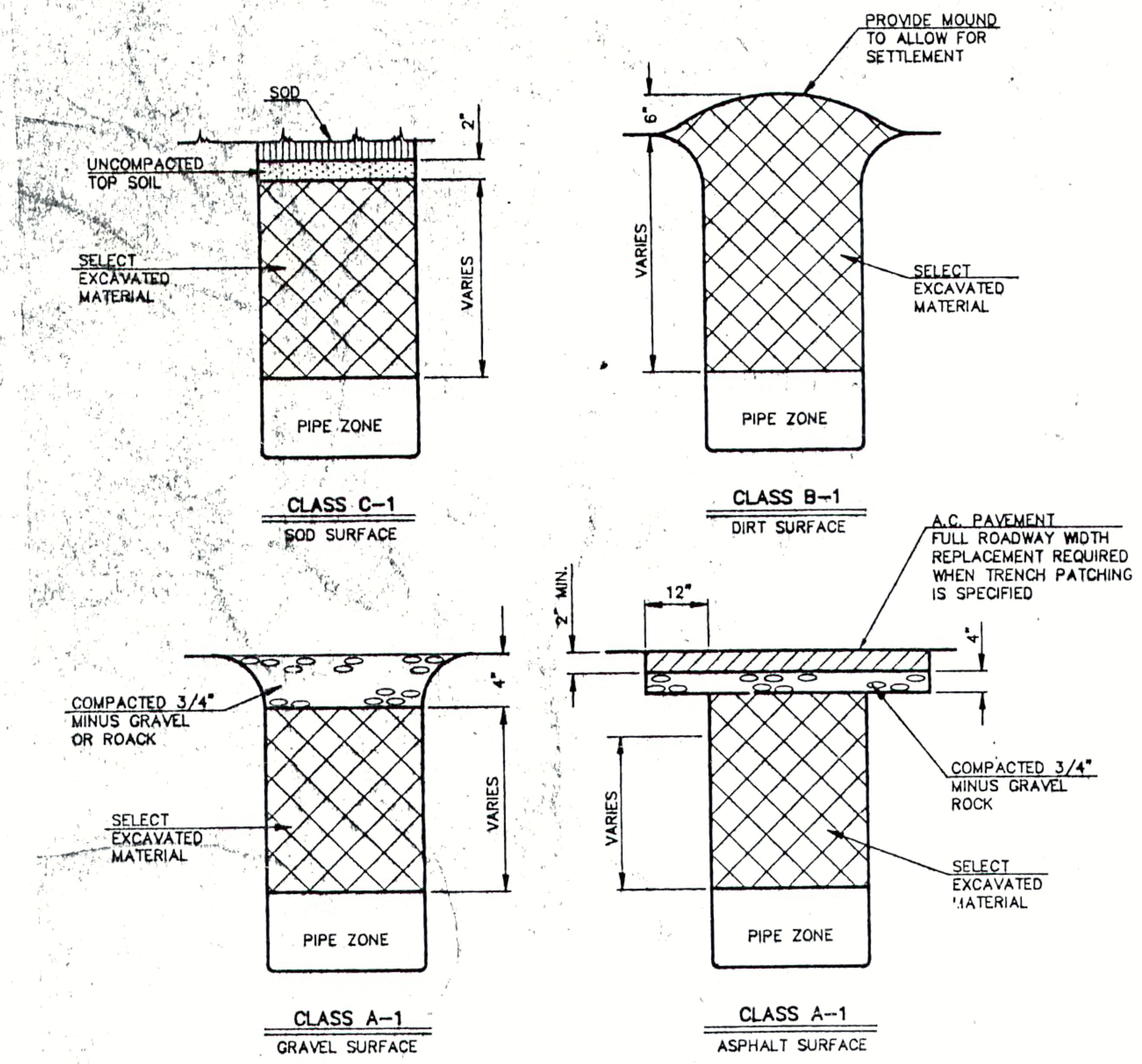
PRELIMINARY PLAT OF SUMMER COVE

UTILITIES PLAN

SLH DEVELOPERS

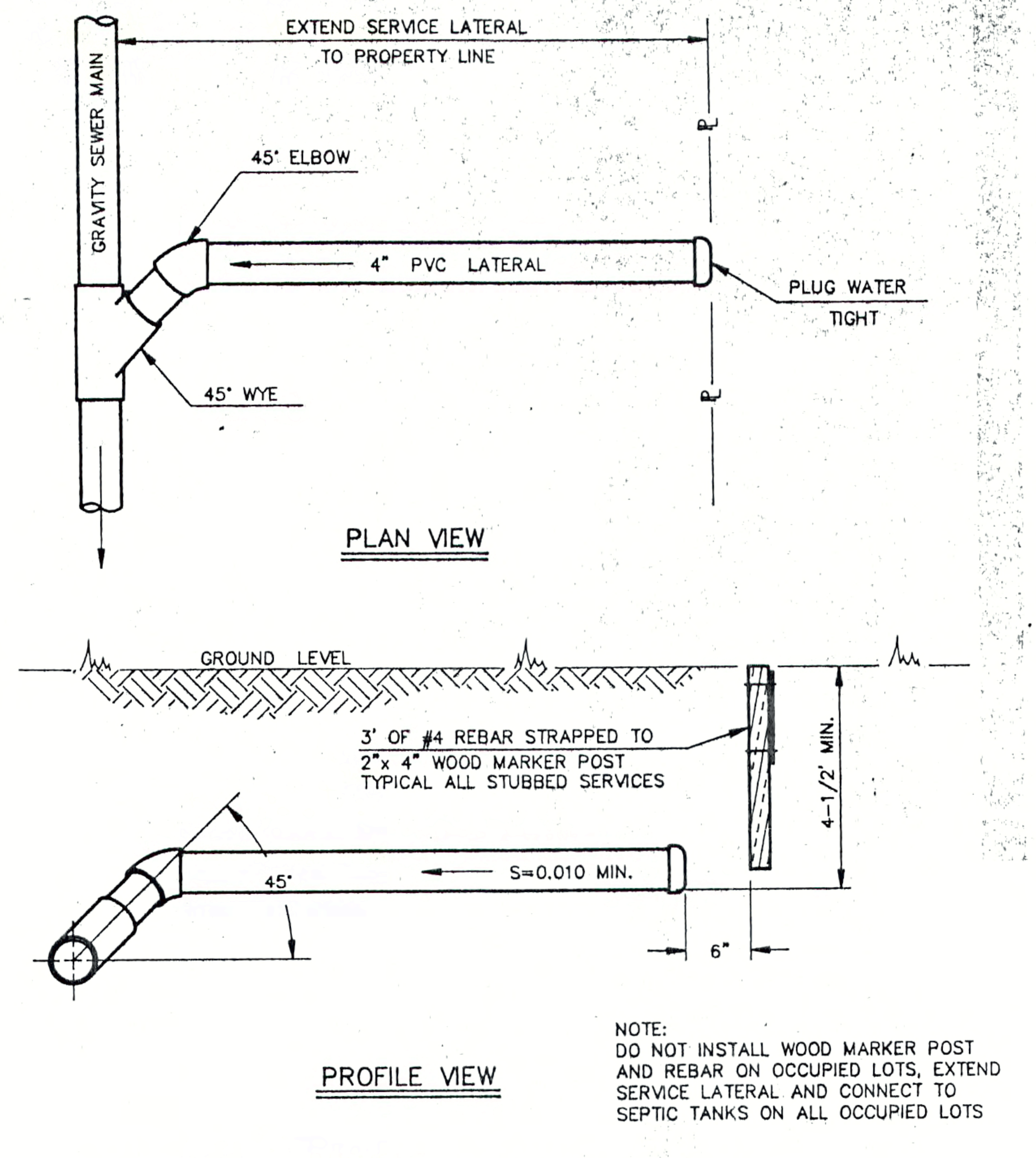
SEITZ ENGINEERING
6175 N. 17th
Coeur d'Alene, ID 83814


SUMMER COVE ROADWAY PLANS
ELMA'S COURT
COTTONWOOD COURT
FARRAGUT BAYVIEW HIGHWAY
CAPE HORN ROAD
20' UTILITY EASEMENT
LOT ACCESS IS FROM CAPE HORN ROAD
SAWCUT 2 FEET INTO EXISTING PAVEMENT TO CONSTRUCT MATCH JOINT
INSTALL STOP-STREET NAME SIGN (R1-1 MUTCD)
30' ROADWAY SLOPE EASEMENT LOTS 3 & 6
INSTALL DEAD END SIGN (W14-1)
INSTALL 18" x 18" END OF ROAD DIAMOND SIGN WITH 9-3" RED REFLECTORS
STA 0+50 INSTALL 600 GAL CATCH BASIN / DRYWELL LEFT AND RIGHT. SEE HIGHWAY DISTRICT STANDARDS
STA 0+20 INSTALL 60 L.F. OF 12"-12GA CMP
A (COMMERCIAL)
RETAINING WALL REQ'D FOR LOT ACCESS
STA 0+70 INSTALL 65 LF OF 12" 12GA CMP
20' UTILITY EASEMENT
DRAINAGE EASEMENT
ROADWAY SLOPE EASEMENT
2 SHOT ASPHALT CHIP SURFACE (AS PER HIGHWAY DISTRICT STDS)
4" OF 3/4" MINUS CRUSHED ROCK
12" OF 4" MINUS PIT RUN BALLAST, MIN.
TYPICAL ROAD SECTION
1"=20'
STA 0+00 BEGIN ELMA'S COURT INT. & FARRAGUT BAYVIEW HIGHWAY
STA 0+00 BEGIN COTTONWOOD COURT INT. & CAPE HORN ROAD
24' VC
100' VC
6" CL 160 PVC WATER LINE
4" SDR 3034 GRAV SEWER LINE
4" SDR 3034 GRAV SEWER LINE
12" CMP
GROUND
EXIST
REGISTERED PROFESSIONAL ENGINEER 5234 STATE OF IDAHO STEVEN J. SEITZ
SEITZ ENGINEERING 6175 N. 17th Coeur d'Alene, ID. 83814
PLAN
PROFILE
Keuffel & Esser Company PLATE 1, PLAN-PROFILE
46 7008 Made in U.S.A.



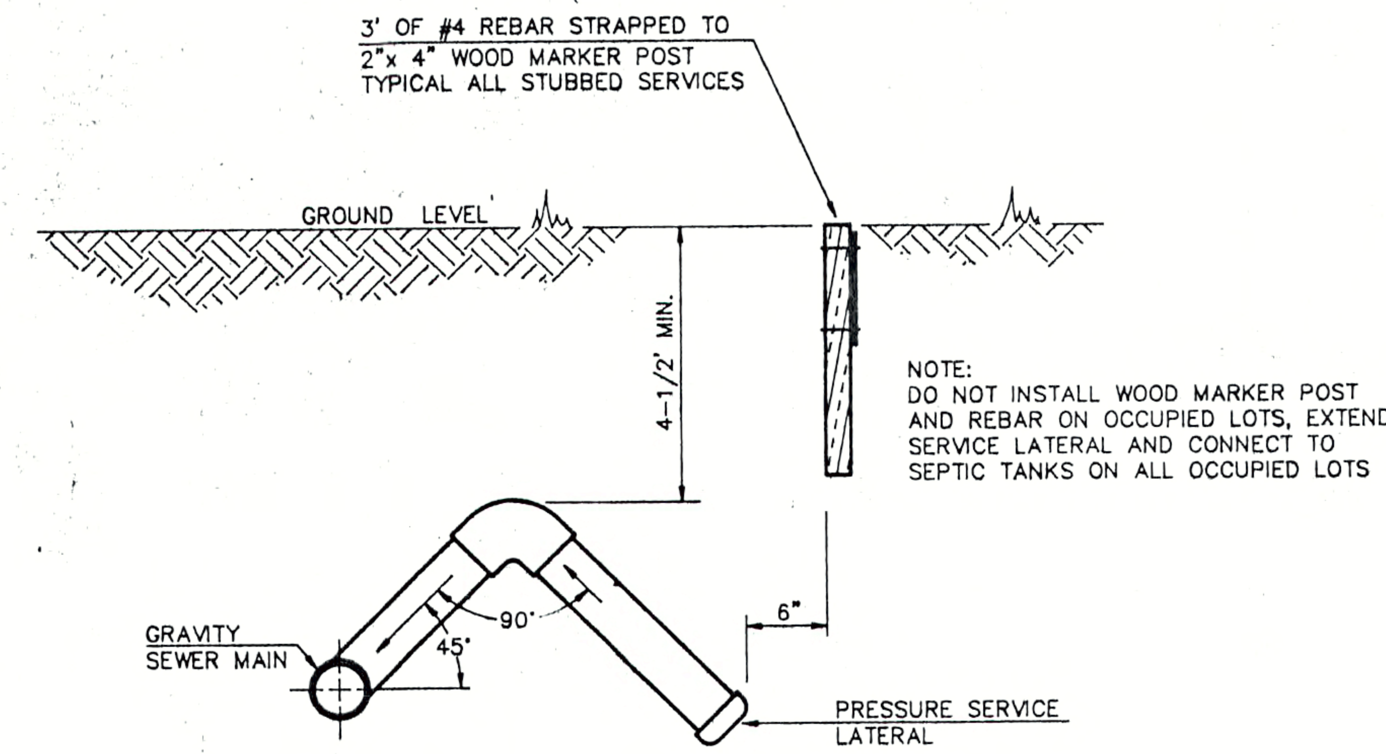
TRENCH AND BACKFILL DETAIL

NO SCALE



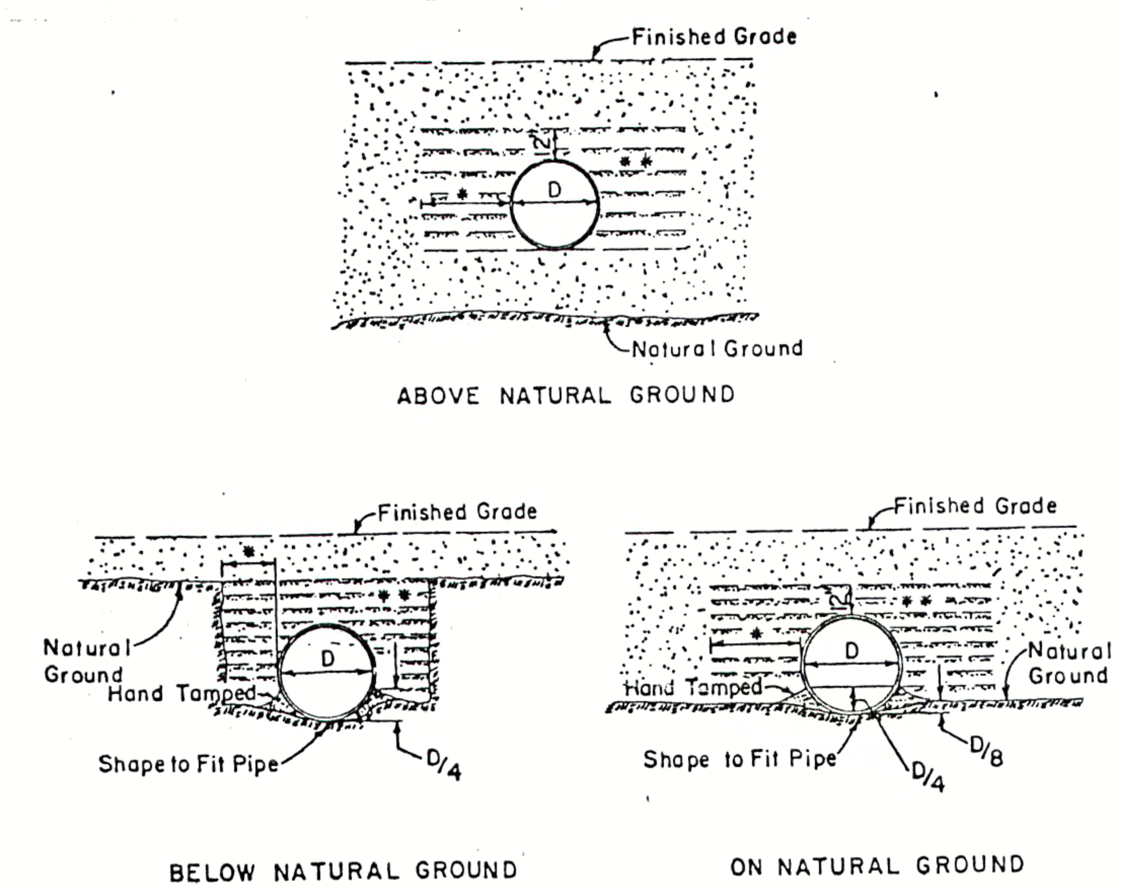
GRAVITY SERVICE LATERAL DETAIL

NO SCALE



PRESSURE TO GRAVITY SERVICE LATERAL

NO SCALE



NOTE: * D or 12" whichever is greater.
** Mechanical compacted backfill. Place in 6" layers.

TYPICAL CULVERT INSTALLATION

N.T.S.

NOTES

It is required that an Engineer be retained for inspection activities during project construction so that Certified Record drawings can be prepared in accordance with Sec. 39-118 of Idaho Code. Plans must be resubmitted for review and approval if construction is not initiated within one year of the date of approval.

The Bayview Water and Sewer District will own and maintain sanitary sewer utilities within the right of way.

Bayview Water and Sewer District will own and maintain water supply facilities within the right of way.

All road construction shall be in accordance with the latest edition of the Highway Standards for the Associated Highway Districts of Kootenai County, Idaho. Contractor to verify location of existing utilities, and shall secure appropriate permit from Lakes Highway District prior to construction.

All materials, installation, and workmanship shall meet the requirements set forth in the 1984 Edition of the Idaho Standards for Public Works Construction (ISPWC) unless revised by any of the follwing articles.

(A) Mainline water piping shall be 6" class 160 pressure rated O-Ring PVC SDR-26 with a minimum burial of 4'-6" to top of pipe.

(B) Water service lines shall be: Double service - 1 1/4 IPS HD-Polyethelyne SDR-9, single service - 3/4 IPS HD - Polyethelyne SDR-9.

(C) Utility trench bedding shall be Type 1. See ISPWC Sec. 303.1 Type 1 pipe bedding.

(D) Backfull/compaction where pipline crosses existing road shall be Type A-1, and the Asphalt cut into the existing road must be made with a neat cut, repaired with plant mix pavement one foot wider than the trench width on each side. A minimum 2-inch patch depth is required over full depth 3/4 inch crushed aggregate backfill. All other backfilling shall meet the requirements of the ISPWC, see detail sheet 3 of 3.

(E) Disinfection shall be by the tablet method. See ISPWC Sec. 407.7.3.

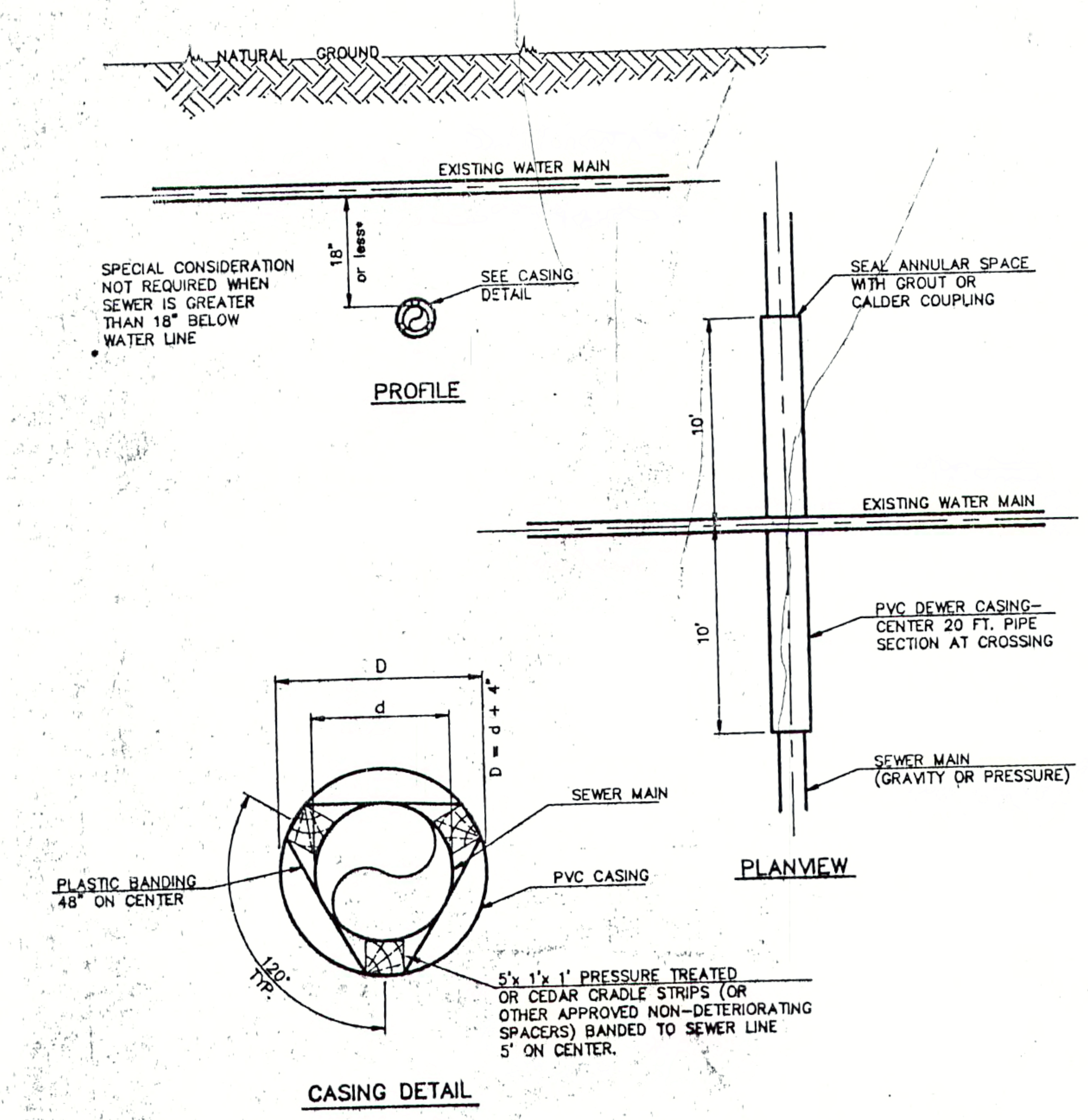
(F) Testing shall conform to Sec. 406 ISPWC Hydrostatic testing and shall be at a pressure of not less than 1.5 times the static pressure at the point of test.

(G) Fire Hydrants shall be as specified in ISPWC Standard Drawing No. SD-401.

(H) Concrete blocking shall be in conformance with ISPWC Standard drawing No. SC-403.

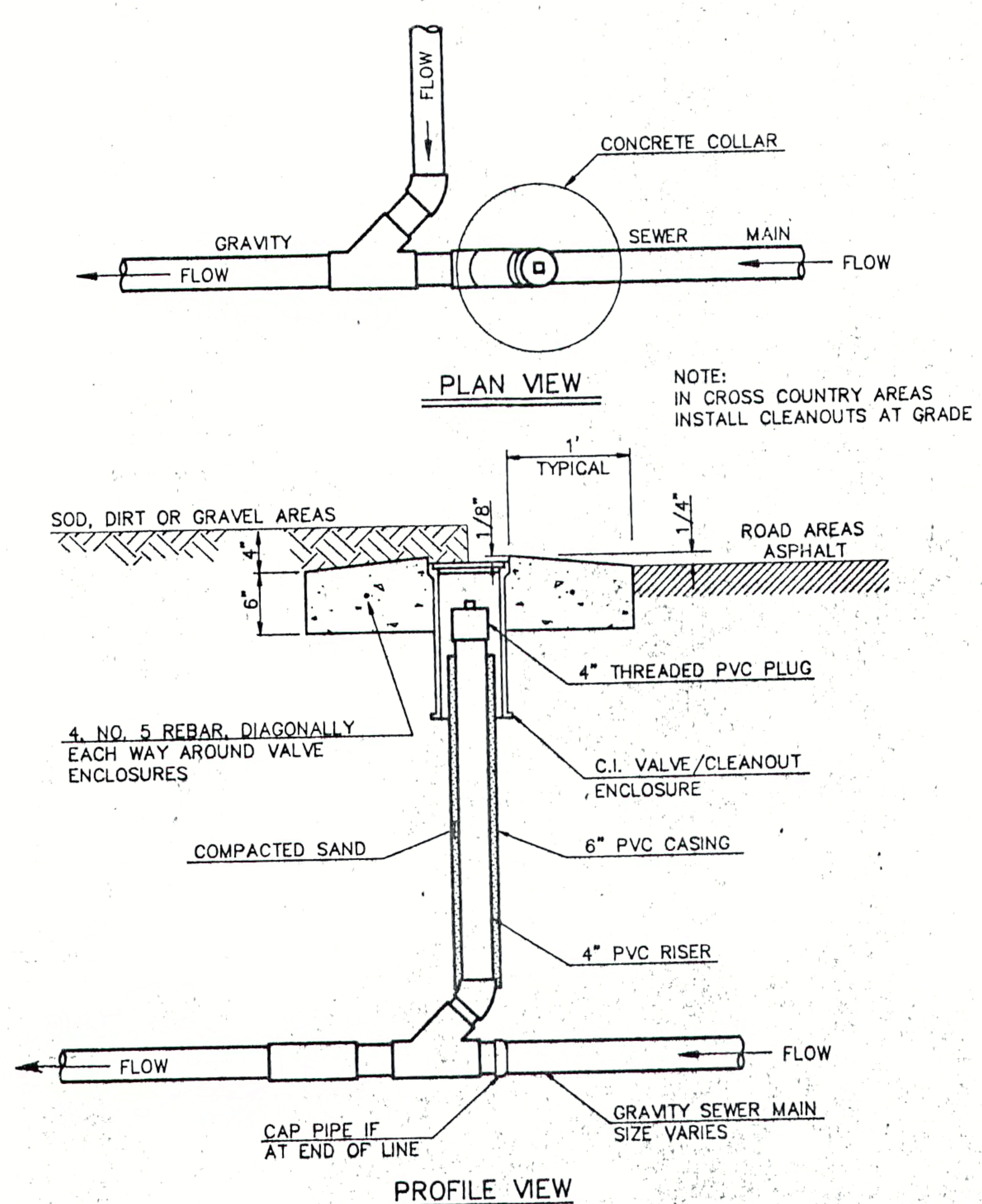
(I) The contractor is required to guarantee the material and installation for a period of one year following date of acceptance.

(J) Magnetic location tape shall be buried with mainline sewer pipe.



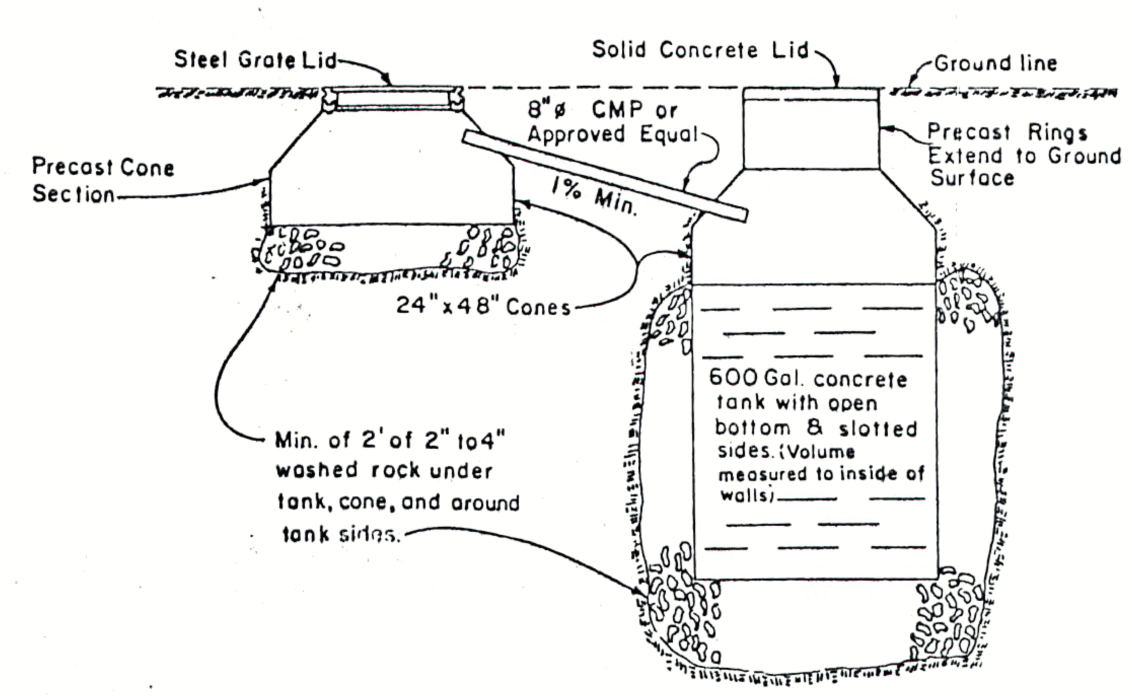
CASED PIPE DETAIL

NO SCALE



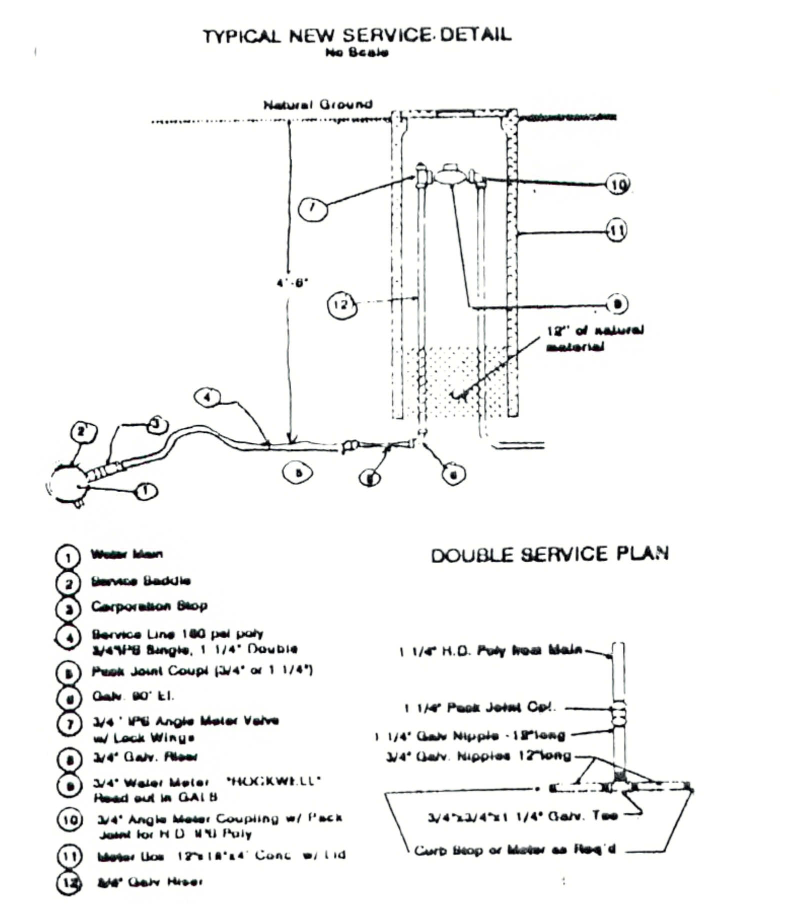
GRAVITY CLEANOUT WITH CONCRETE COLLAR

NO SCALE



CATCH BASIN & DRYWELL INSTALLATION

N.T.S.



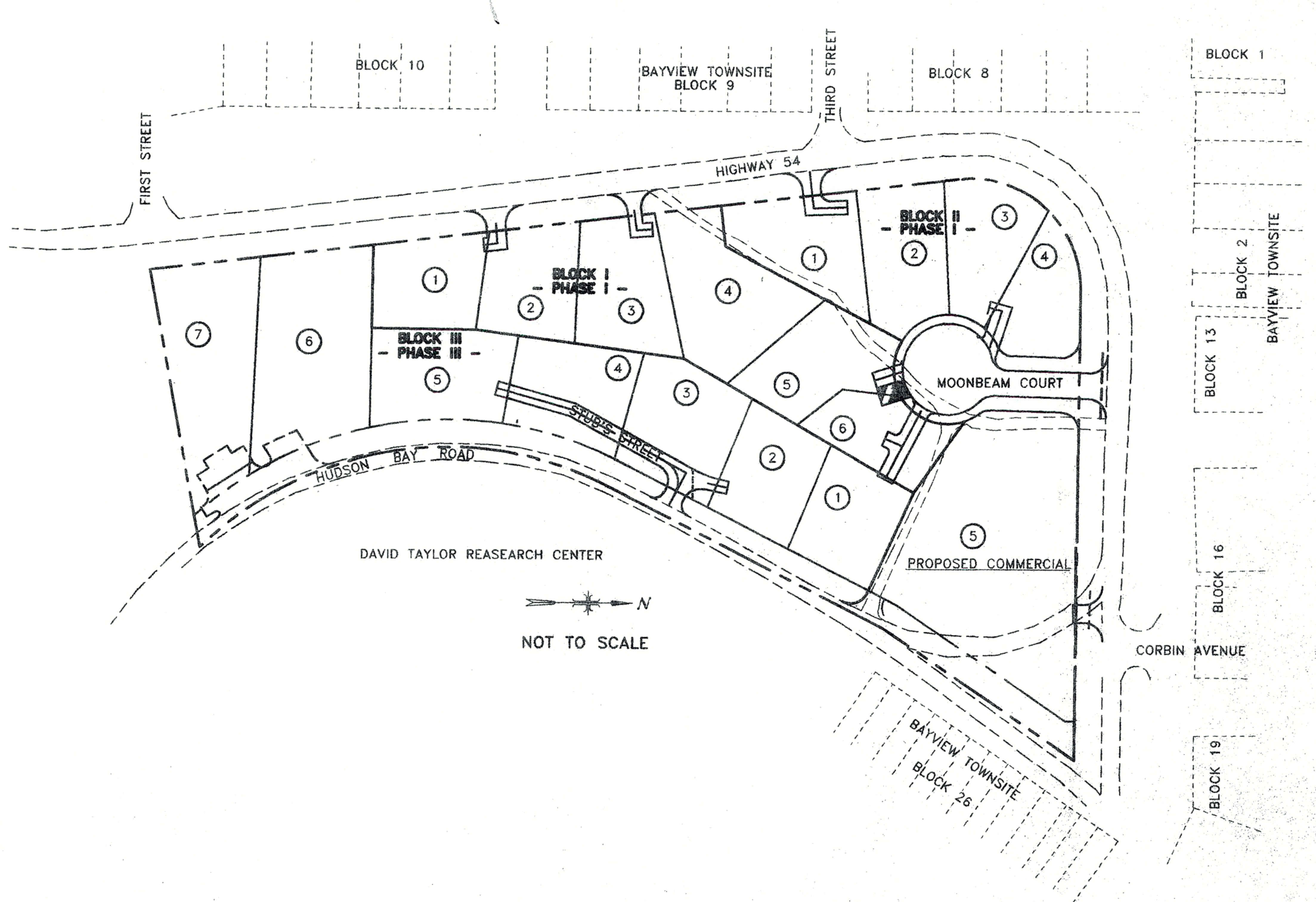
WATER SERVICE

PRELIMINARY PLAT OF
SUMMER COVE

DETAILS AND NOTES FOR CONSTRUCTION

SEITZ ENGINEERING
6175 N. 17th
Coeur d'Alene, ID 83814

REFLECTION RIDGE SUBDIVISION
CONSTRUCTION PLANS
BAYVIEW
KOOTENAI COUNTY, IDAHO

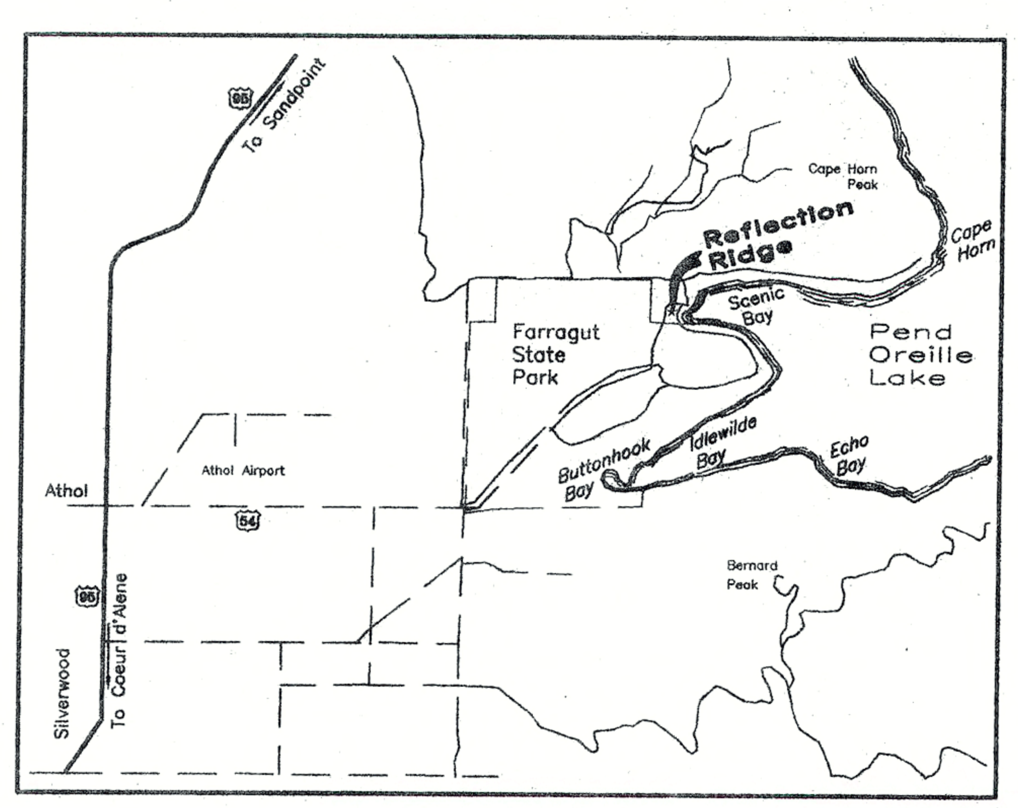


OWNER

BULL'S - EYE DEVELOPMENT
Doug and Lorraine Landwehr
P.O. Box 1748
Hayden Lake, Idaho 83835
(208) 683-2963

ENGINEER

J-U-B ENGINEERS, INC.
2005 Ironwood Parkway, Suite 201 . Coeur d'Alene, Idaho 83814
Telephone (208) 667-1574
Fax (208) 667-2176



VICINITY MAP
NOT TO SCALE

INDEX OF SHE

SHEET NO.	DESCRIPTION
1	COVER SHE
2	CONTOUR
3	MOON BEAM
4	HUDSON BAY
5	STUB'S
6	ACCESS
7	STREET DET
8	UTILITY PLA
9	SEWER PRO
10	SEWER PRO
11	SEWER PRO
12	CONSTRUCT

RECORD DR

DATE: FEBRUARY 5, 1993

LEGEND

- LOT LINE
- SUBDIVISION BOUNDARY LINE
- EDGE OF (EXISTING) ROAD
- CENTER LINE
- EXISTING DITCH
- PROPOSED 6" SEWER LINE
- WATER LINE
- EASEMENT LINE
- 2120 CONTOUR (PRIMARY)
- CONTOUR (SECONDARY)
- ROAD WAY (NEW)
- FIRE HYDRANT (NEW)
- W WATER SERVICE
- WATER VALVE
- SEWER STUB
- WATERMAN HOLE (NEW)
- MANHOLE DRYWELL
- C.O. SEWER CLEANOUT (NEW)
- SEWER CLEANOUT (See Details Sheet 12 of 12)
- WATER LINE CASING
- EXISTING FENCE
- EXISTING OVERHEAD UTILITY
- PROPOSED OVERHEAD UTILITY
- 208 SWALE AREA
- PROPOSED DITCH ALIGNMENT
- BLOCK BOUNDARIES
- EXISTING SIGN
- DRAINAGE BOUNDARY
- DRAINAGE AREA

GENERAL NOTES

1. All water, sewer, storm sewer and road construction shall be in accordance with the 1990 Idaho Standards for Public Works Construction and/or the 1988 Highway Standards for the Associated Highway Districts, Kootenai County, Idaho.
2. Utility locations are plotted from the best available information. Actual field location may vay from the plans. It is the contractors responsibility to contact utility companies for actual locations. Ask operator for Zenith 9162.

COMPACTION TESTING REQUIREMENTS

1. Roadways – a minimum of 1 compaction test per 100 feet of each travel lane shall be taken on subgrade and each aggregate gravel course.
2. Trenches – a minmum of 3 compaction tests shall be taken within a maximum distance of 300 feet of trench for Type "A" and Type "B" trenches. Tests shall be taken at various depths as directed by the Engineer.

NOTE:
ACCESS DRIVEWAYS ARE SHOWN AS CONSTRUCTED AT THIS TIME. FOR FUTURE ACCESS CONSTRUCTION SEE DESIGN CONSTRUCTION DRAWING.

RECORD DRAWINGS
Joel W. Petty 2-5-93
Joel W. Petty P.E.

RECORD DRAWING CERTIFICATIONS

These Record Drawings represent the locations of improvements based on field observations made during construction.

REFLECTION ... SUBDIVISION
BAYVI...
CONTOUR...
JUB ENGINEERS SURVEYORS PLANNERS
SCALE: 1"=40'

BLOCK II - PHASE I -
BLOCK I - PHASE I -
Paved Driveway Approaches
3' x 3' concrete with grate inlet
12 CMP
New sewer cleanout
Access (B) Rad. Pt. Sta. 2+89.3
11+89 Rad. Pt.
Access (A)
MOONBEAM COURT
2+00.8
Proposed Edge of Asphalt
Snow Storage Easement
12 CMP 60LF
8% (Max.)
COMMERCIAL AREA
60' Right of Way
Varies
13'
Gravel Shoulder
6" Min.
Slope Varies
Ditch may be Deepened to Facilitate Drainage
2" Asphalt
4" - 3/4" Minus Base
12" - Pit Run Subbase
Subgrade (compacted)
* 2' Gravel shoulder on road and Culdesac
TYPICAL MOONBEAM COURT SECTION
NOT TO SCALE
ACAD FILE: BAYTYP.DWG
PLOT SCALE: 1=20
RECORD DRAWING CERTIFICATIONS
These Record Drawings represent the locations of improvements based on field observations made during construction.
NOTE:
ACCESS DRIVEWAYS ARE SHOWN AS CONSTRUCTED AT THIS TIME. FOR FUTURE ACCESS CONSTRUCTION SEE DESIGN CONSTRUCTION DRAWING.
THIS DRAWING, INFORMATION AND SUBJECT MATTER ARE THE CONFIDENTIAL AND EXCLUSIVE PROPERTY OF J-U-B ENGINEERS, INC. AND ARE NOT TO BE COPIED, REPRODUCED, USED IN ANY MATTER WHATSOEVER, OR SUBMITTED TO OUTSIDE PARTIES WITHOUT THE WRITTEN CONSENT OF J-U-B ENGINEERS, INC.
NOT CONSTRUCTED
LOT 5 BLOCK 2, LOT 6 BLOCK1 AND LOT 1 BLOCK 3 ACCESS ROAD
MOONBEAM COURT
LOTS 3 & 4 BLOCK 2 ACCESS ROAD
LOT 5 BLOCK 1 ACCESS ROAD
FINISH GRADE AT ℄
EXISTING GROUND AT ℄
EXISTING GRADE AT ℄
TYPICAL SECTION FOR ACCESS ROADS
NOT TO SCALE
COMPACTION TESTING REQUIREMENTS
1. Roadways - a minimum of 1 compaction test per 100 feet of each travel lane shall be taken on subgrade and each aggregate gravel course.
2. Trenches - a minimum of 3 compaction tests shall be taken within a maximum distance of 300 feet of trench for Type "A" and Type "B" trenches. Tests shall be taken at various depths as directed by the Engineer.
RECORD DRAWINGS
Joel W. Petty, P.E.
2-5-93
REFLECTION RIDGE SUBDIVISION
BAYVIEW, IDAHO
PLAN AND PROFILE - RECORD DWG
MOONBEAM COURT
J-U-B ENGINEERS, INC.
Engineers Surveyors Planners
Coeur d'Alene, Idaho
SCALE: 1"=20'
SHEET 3 OF 12

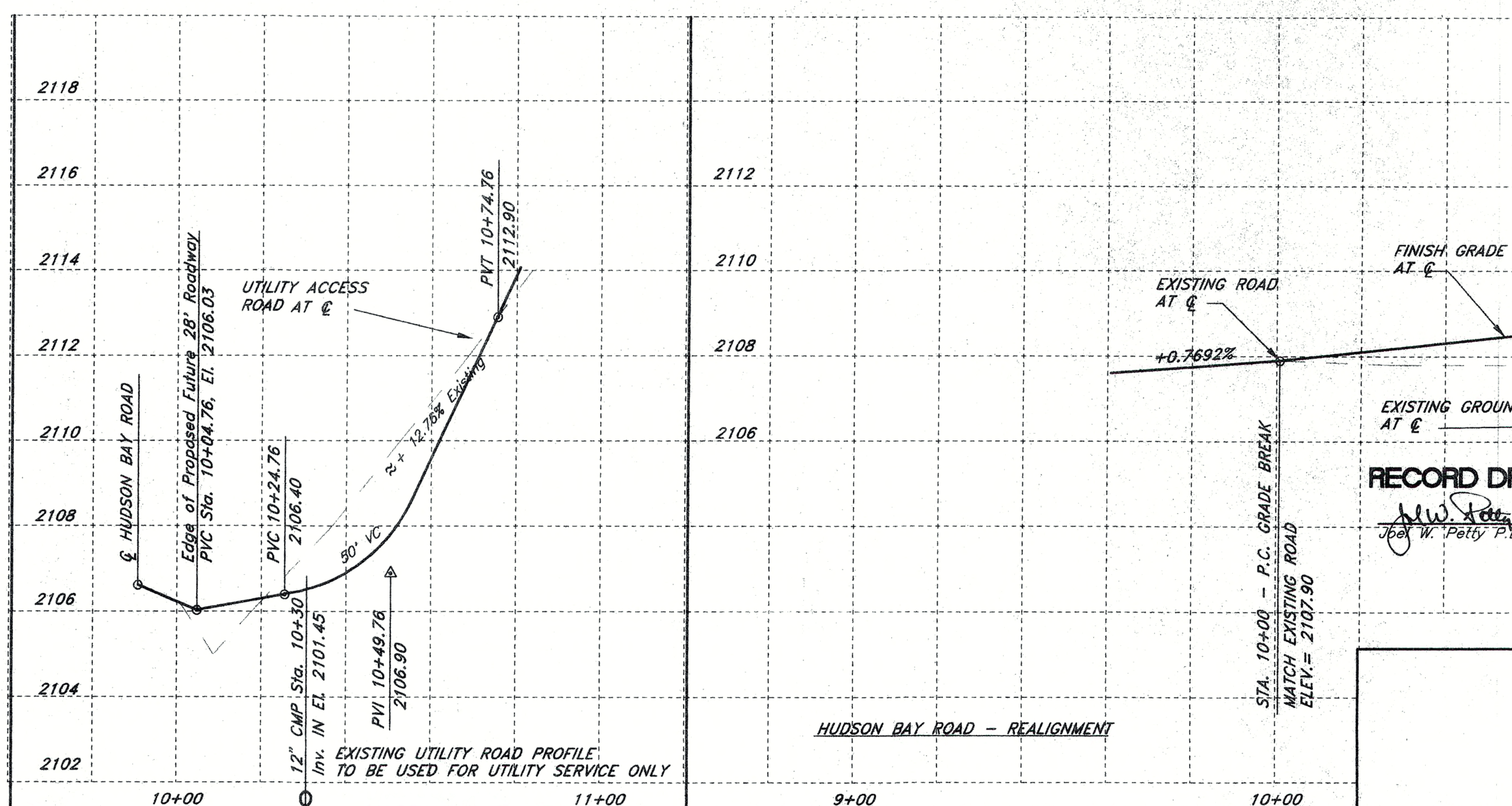
COMPACTION TESTING REQUIREMENTS

1. Roadways – a minimum of 1 compaction test per 100 feet of each travel lane shall be taken on subgrade and each aggregate gravel course.
2. Trenches – a minimum of 3 compaction tests shall be taken within a maximum distance of 300 feet of trench for Type "A" and Type "B" trenches. Tests shall be taken at various depths as directed by the Engineer.

NOTE:
ACCESS DRIVEWAYS ARE SHOWN AS CONSTRUCTED AT THIS TIME. FOR FUTURE ACCESS CONSTRUCTION SEE DESIGN CONSTRUCTION DRAWING.

RECORD DRAWING CERTIFICATIONS

These Record Drawings represent the locations of improvements based on field observations made during construction.



REFLECTION RIDGE SUBDIVISION
BAYVIEW, IDAHO

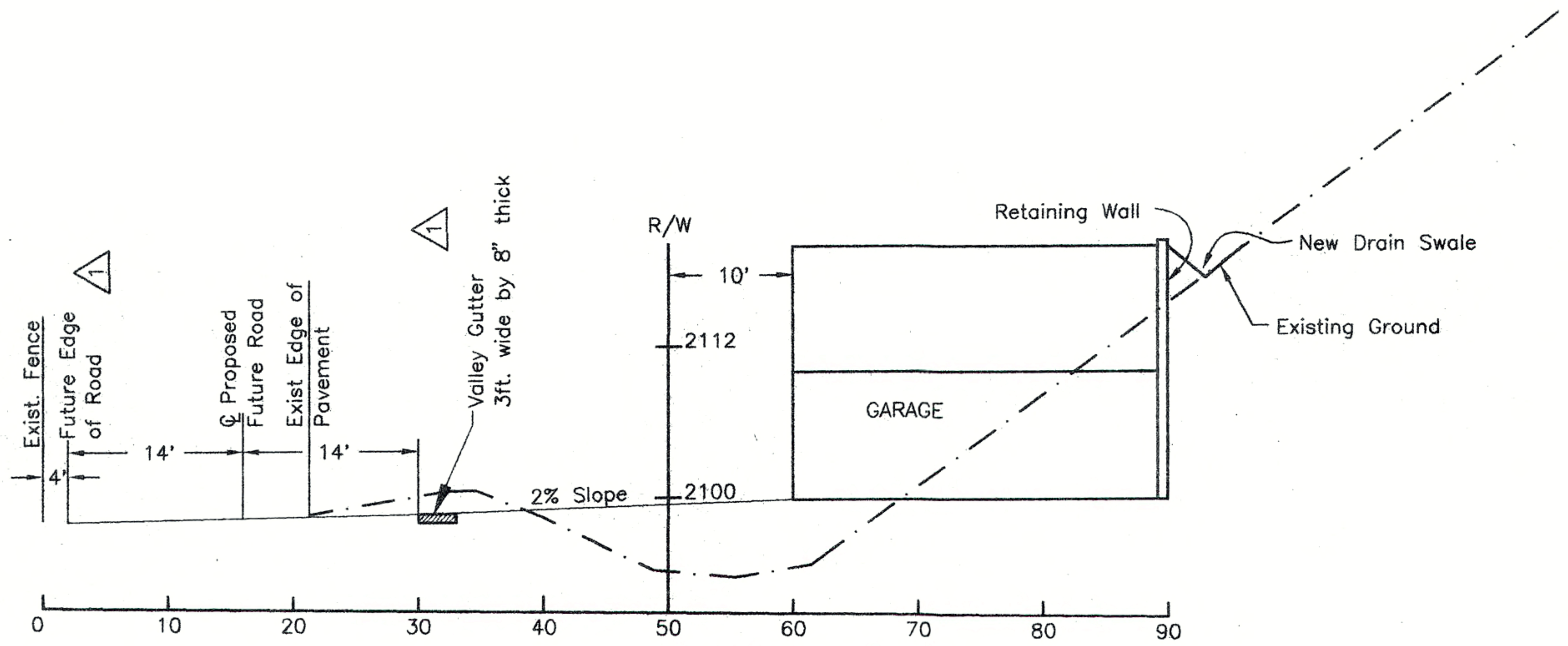
PLAN AND PROFILE – RECORD DWG
HUDSON BAY ROAD AT HWY. 54

J-U-B ENGINEERS, INC.
Engineers Surveyors Planners
Coeur d'Alene, Idaho

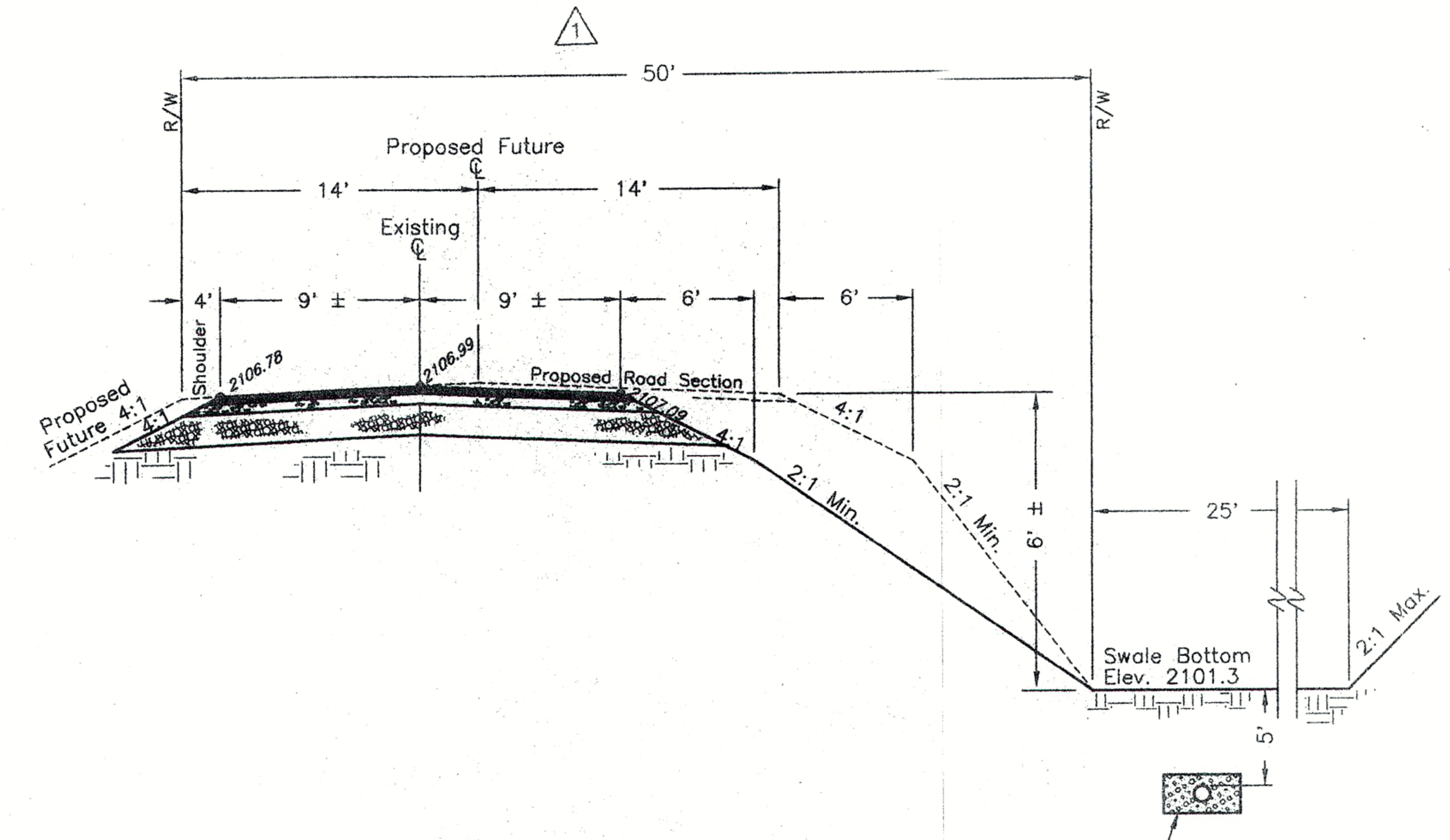
ACAD.DWG FILE 212B-REC.DWGPLT.SC.(1=20)			
DES. EMW	DR. DpS	CH. JP	SHEET 4 OF 12
SCALE: 1"=20'	DATE: FEBRUARY,1991	DWG.NO. C910212-4	

BLOCK III
- Phase II -
BLOCK I
- Phase I -
10' WIDE UTILITY EASEMENT
Overflow Catch Basin to be installed See Detail 1 Sheet 12 of 12
10' WIDE UTILITY EASEMENT
1-1/2" Service
Proposed Right of Way Hudson Bay Road
Ecology Block Wall
Fire Hydrant
6" Water Main
Proposed Edge of 2.5' Swale Bottom
Edge of Proposed 28' Roadway
1% Slope Swale Bottom
8"W (EXIST)
Sewer Cleanout
Paved Turn Around
20' Wide Utility Easement
1-1/2" W 60 LF
Swale Bottom Elev. 2099.68
Parking Garage
Exist. 12" CMP Pluged and Buried
New 8" x 6" Connection
Effluent Sewer Main (By Sewer District)
Sewer Connection Sta. 21+30, Bayview Sewer Plans Inv. 2094.00
1" = 20'
Effluent Sewer Main (By Sewer District)
Ecology Block wall
Sewer Cleanout (under wall)
4" San
6 x 2 Reducer
Ecology Block wall
15" PVC Drain Pipe
℄ 28' New Roadway
Sewer Connection Sta. 16+90, Bayview Sewer Plans Inv. 2094.00
HUDSON BAY ROAD
DAVID TAYLOR REASEARCH CENTER
New Right-of-Way
Paved Turn Around
8"W (EXIST)
Effluent Sewer Main (By Sewer District)
COMPACTION TESTING REQUIREMENTS
1. Roadways – a minimum of 1 compaction test per 100 feet of each travel lane shall be taken on subgrade and each aggregate gravel course.
2. Trenches – a minimum of 3 compaction tests shall be taken within a maximum distance of 300 feet of trench for Type "A" and Type "B" trenches. Tests shall be taken at various depths as directed by the Engineer.
RECORD DRAWING CERTIFICATIONS
These Record Drawings represent the locations of improvements based on field observations made during construction.
NOTE:
ACCESS DRIVEWAYS ARE SHOWN AS CONSTRUCTED AT THIS TIME. FOR FUTURE ACCESS CONSTRUCTION SEE DESIGN CONSTRUCTION DRAWING.
THIS DRAWING, INFORMATION AND SUBJECT MATTER ARE THE CONFIDENTIAL AND EXCLUSIVE PROPERTY OF J-U-B ENGINEERS, INC. AND ARE NOT TO BE COPIED, REPRODUCED, USED IN ANY MATTER WHATSOEVER, OR SUBMITTED TO OUTSIDE PARTIES WITHOUT THE WRITTEN CONSENT OF J-U-B ENGINEERS, INC.
EXISTING GROUND AT ℄
Access Road Lot 4, 7, & 9
PVC 10+34 2105.18
PVI 10+59 2105.68
50' VC
PVC 10+84 2108.18
PVT 10+84 2108.18
+10%
PVI 11+09 2110.68
PVT 11+34 2111.18
+2%
LOTS 2 ACCESS ROAD
10+00
11+00
STA. 10+00 MATCH EXIST. ROAD ELEV. = 2105.0
Sta. 10+14, Shoulder of Proposed Future Road Elev. 2104.78
PVC 10+27 2105.23
12" CMP Sta. 10+18 Inv. Elev. 2102.92
PVI 10+50 2105.76
PVT 10+82 2108.26
Sta. 1094 Lot 3 Access
EXISTING GROUND AT ℄
Matchline Sta. 11+40
LOTS 2, 3, 4 AND 5 ACCESS ROAD
11+40
EXISTING GROUND AT ℄
Matchline Sta. 11+40
PVC 11+83 2119.60
Sta. 11+96, Lot 4 Access
PVI 11+93 2120.64
PVT 12+33 2122.02
℄ Sta. 12+57.7, Turnout Elev. 2122.73
Sta. 12+91, End Road Elev. 2123.40
CONTINUATION LOTS 2, 3, 4 AND 5 ACCESS ROAD
12+00
13+00
RECORD DRAWINGS 2-8-93
REFLECTION RIDGE SUBDIVISION BAYVIEW, IDAHO
STUB'S STREET PLAN AND PROFILE -RECORD DWG
J-U-B ENGINEERS, INC. Engineers Surveyors Planners Coeur d'Alene, Idaho
ACAD.DWG FILE: 212C-REC.DWGPLT.SC. (1=20)
DES. JWP DR. JFH CH. JWP SHEET 5 OF
SCALE: AS SHOWN
DATE: FEBRUARY, 1991
DWG.NO C910212

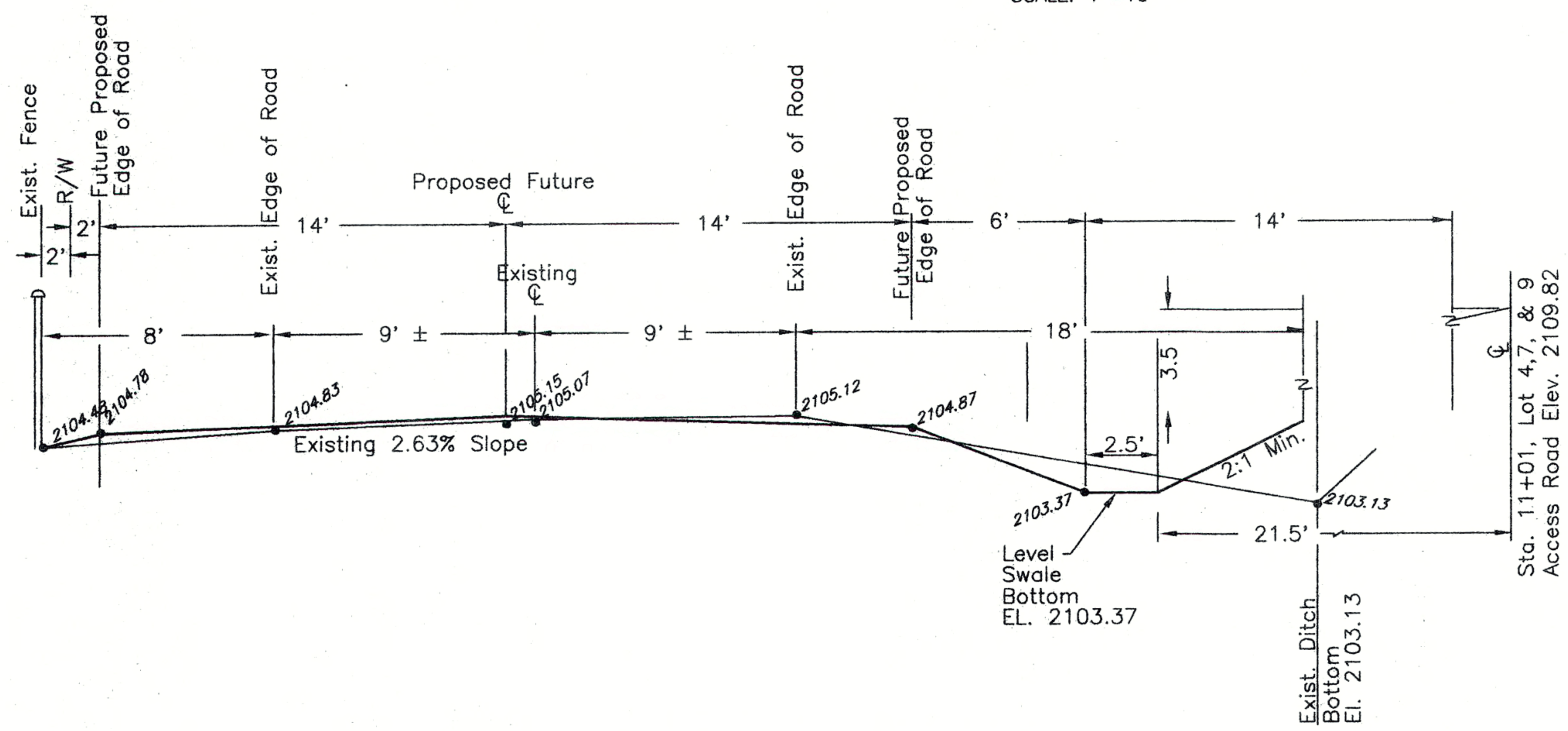

THIS DRAWING, INFORMATION AND SUBJECT MATTER ARE THE CONFIDENTIAL AND EXCLUSIVE PROPERTY OF J–U–B ENGINEERS, INC. AND ARE NOT TO BE COPIED, REPRODUCED, USED IN ANY MATTER WHATSOEVER, OR SUBMITTED TO OUTSIDE PARTIES WITHOUT THE WRITTEN CONSENT OF J–U–B ENGINEERS, INC.
RECORD DRAWING CERTIFICATIONS
These Record Drawings represent the locations of improvements based on field observations made during construction.
NOTE:
ACCESS DRIVEWAYS ARE SHOWN AS CONSTRUCTED AT THIS TIME. FOR FUTURE ACCESS CONSTRUCTION SEE DESIGN CONSTRUCTION DRAWING.
N
1"=20'
Proposed Pressure Reducing Station to be calibrated to match existing pressure @ Hudson Bay Road ≈ 60psi drop from ≈ 108psi
℄ STATE HIGHWAY 54
12" CMP
12" CMP
R=20
R=10
10' Wide Utility Access
Joint Access and Utility Easement
BLOCK II
- Phase I -
BLOCK I
- Phase I -
BLOCK III
- Phase II -
10' Wide Utility Access
10' Wide Utility Access
2190
2170
2140
LOT 2 BLOCK I ACCESS
LOT 1 BLOCK II ACCESS
LOT 1 BLOCK I ACCESS
LOT 1 & 2 BLOCK II ACCESS
LOT 4 & 6 BLOCK I ACCESS
LOT 2 BLOCK II ACCESS
Exist. Grade
50' VC
PVI STA. 1+79
ELEV.= 2181.17
PVI STA. 2+07.5
ELEV.= 2165.20
PVI STA. 2+29
ELEV.= 2176.11
RECORD DRAWINGS
REFLECTION RIDGE SUBDIVISI
BAYVIEW, IDAHO
ACCESS EASEMENT HIGHWAY 54
PLAN AND PROFILE – RECORD DW
J–U–B ENGINEERS, INC.
Engineers Surveyors Planners
Coeur d'Alene, Idaho
SCALE: AS SHOWN
DES. JWP
DR. JFH
CH. JWP
DATE: FEBRUARY, 1991



SECTION D–D
SCALE: 1"=10'

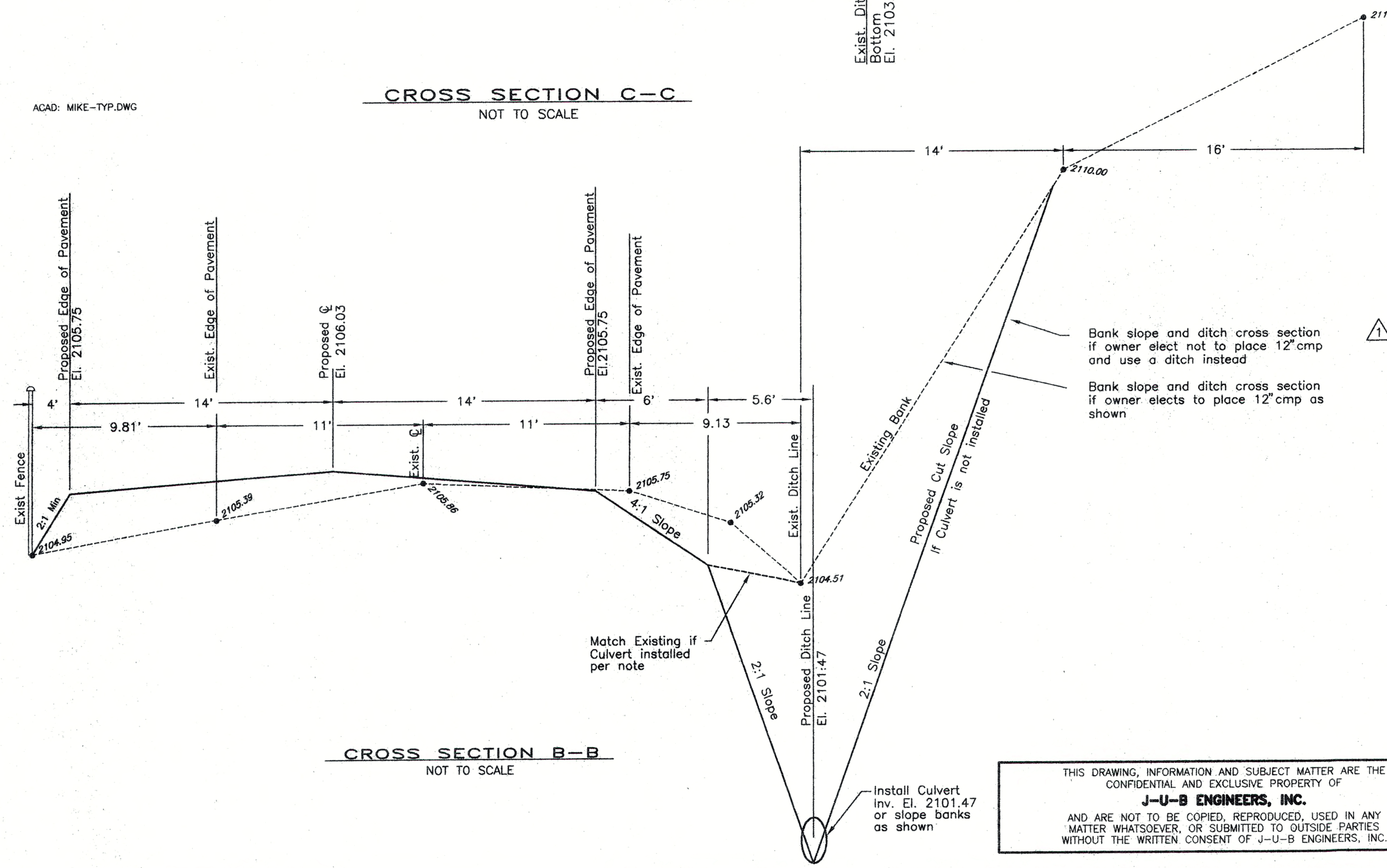


CROSS SECTION A–A
NOT TO SCALE
ACAD FILE: BAYTYP4.DWG
PLOT SCALE: 1=20

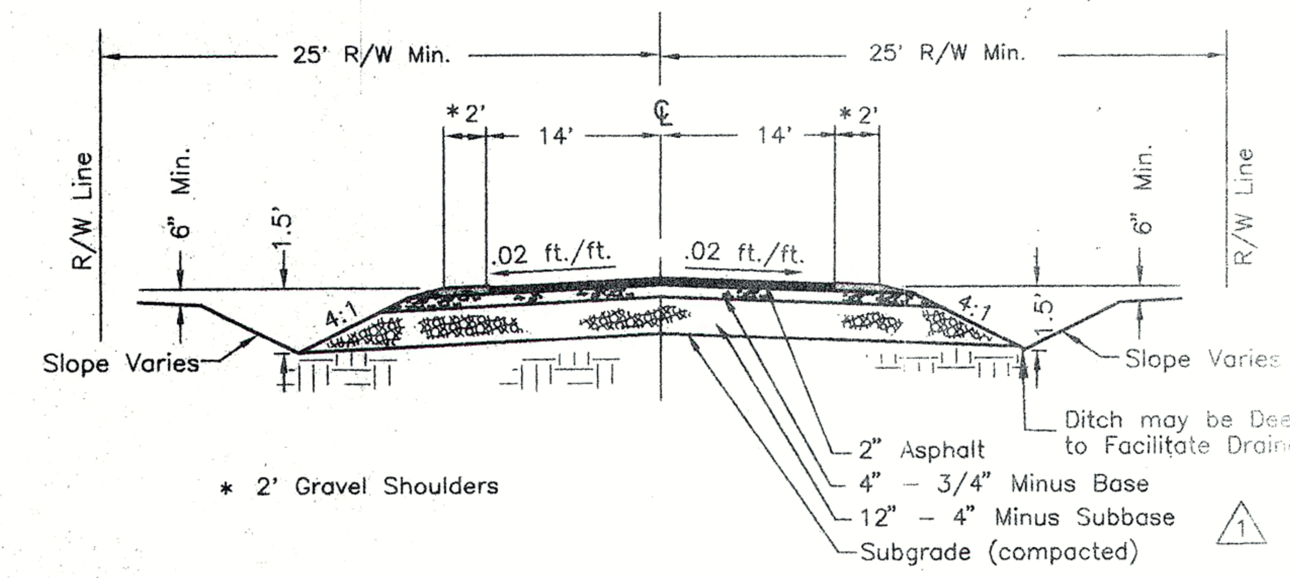


ACAD: MIKE-TYP.DWG

CROSS SECTION C–C
NOT TO SCALE



CROSS SECTION B–B
NOT TO SCALE



PROPOSED TYPICAL SECTION
FOR HUDSON BAY ROADWAY
NOT TO SCALE

THIS DRAWING, INFORMATION AND SUBJECT MATTER ARE THE CONFIDENTIAL AND EXCLUSIVE PROPERTY OF
J–U–B ENGINEERS, INC.
AND ARE NOT TO BE COPIED, REPRODUCED, USED IN ANY MATTER WHATSOEVER, OR SUBMITTED TO OUTSIDE PARTIES WITHOUT THE WRITTEN CONSENT OF J–U–B ENGINEERS, INC.

RECORD DRAWINGS
Joel W. Petty P.E.
2-5-93

1 Revised April, 1991

NO.	DESCRIPTION OF REVISION	APP

REFLECTION RIDGE SU... ...SION
BAYVIEW, IDA...

STREET DETAI...
RECORD DRAWI...

J–U–B EN... ...ERS, IN...
Engineers Su... ...s Planner...
Coeur d'Al... ..., Idaho

ACAD.DWG FILE: BSTDE... ...G PLT.SC. (1...
DES. MRL | DR. JFH | CH. ... | SHEET ...
SCALE: AS SHOWN | DATE: MARCH, 1991 | DWG.NO. ...

PROJECT NO. :
DATE/TIME OF PLOT:

GENERAL NOTES

1. All water, sewer, storm sewer and road construction shall be in accordance with the 1990 Idaho Standards for Public Works Construction and/or the 1988 Highway Standards for the Associated Highway Districts, Kootenai County, Idaho.
2. Utility locations are plotted from the best available information. Actual field location may vary from the plans. It is the contractors responsibility to contact utility companies for actual locations. Ask operator for Zenith 9162.
3. Sewer and water connections along Hudson Bay Road should be coordinated and constructed in conjunction with Bayview sewer construction along Hudson Bay Road. See trench backfill detail.
4. Water and sewer lines to be constructed with 4.5' minimum depth of cover. Where sewer line crosses water main lines, encasement may be necessary (per 10 State Standards). See water sewer crossing detail sheet.

NOTE:
ACCESS DRIVEWAYS ARE SHOWN AS CONSTRUCTED AT THIS TIME. FOR FUTURE ACCESS CONSTRUCTION SEE DESIGN CONSTRUCTION DRAWING.

COMPACTION TESTING REQUIREMENTS

1. Roadways -
a minimum of 1 compaction test per 100 feet of each travel lane shall be taken on subgrade and each aggregate gravel course.
2. Trenches -
a minmum of 3 compaction tests shall be taken within a maximum distance of 300 feet of trench for Type "A" and Type "B" trenches. Tests shall be taken at various depths as directed by the Engineer.

RECORD DRAWINGS
2-5-93
Joel W. Petty P.E.

RECORD DRAWING CERTIFICATIONS

These Record Drawings represent the locations of improvements based on field observations made during construction.

REFLECTION RIDGE SUBDIVISION
BAYVIEW, IDAHO

UTILITY PLAN – RECORD DWG

J-U-B ENGINEERS, IN
Engineers Surveyors Planner
Coeur d'Alene, Idaho

ACAD.DWG FILE: BAYUTREC.DWG	PLT.SC. (1=40)		
DES. JWP	DR. JFH	CH. JWP	SHEET 8 OF 12
SCALE: AS SHOWN	DATE: FEBRUARY, 1991	DWG.NO.	

SEWER LINE "A2"
Sta. 1+00 At Line "A" Sta. 2+60
Inv. Elev. 2116.82
Slope = .0489 Ft/Ft
Sta. 1+18, Inv. Elev. 2117.70
Sta. 1+55
Lot 6 Service
Inv. Elev. 2121.40
Slope = .1000 Ft/Ft
2:1 Slope
Edge of Access Road
Sta. 2+00, ℄ Lot 5 Access Road
Elev. 2125.82
Edge of Access Road
1%
2:1
Proposed Finish Grade
Sta. 1+95
Inv. Elev. 2125.40
Slope = .1815 Ft/Ft
4" ASTM 3034
Sta. 2+70
Lot 5 Service
Inv. Elev. 2136.76
Existing Grade
Sta. 3+38
Inv. Elev. 2147.10
Sta. 3+55
Lot 4 Service
Inv. Elev. 2148.53
Sta. 3+58 Cleanout
Rim Elev. 2154.00
See Detail
Slope = .0841 Ft/FT
4" ASTM 3034
Sta. 4+20, Lot 3 Service
Capped End
Inv. Elev. 2154.00
SEWER LINE "C"
Sta. 0+00, Start Sewer Branch, Inv. Elev. 2094.50
Sta. 21+30, Bayview Sewer 6" Inv. Elev. 2094.00
Slope = .01 Ft/Ft
4" ASTM 3034
Sta. 10+04, ℄ Existing Road
Sta. 0+23, Proposed Edge of Road
Elev. 2098.30
Sta. 0+34, Cleanout
Rim Elev. 2098.80
See Detail
Pipe Anchor as per Idaho Standard for Public Works Construction standard drawing SD-510 Typical
Sta. 0+53
Inv. Elev. 2095.03
Sta. 0+59, Lot 6 Block III Service
Inv. Elev. 2098.29
Slope = .4574 Ft/Ft
4" ASTM 3034
Proposed Finish Grade
Existing Grade
Sta. 0+90, Capped End Lot 7 Block III Service
Inv. Elev. 2111.95
Pipe Anchor as per Idaho Standard for Public Works Construction standard drawing SD-510 Typical
2158
2156
2154
2152
2150
2148
2146
2144
2142
2140
2138
2136
2134
2132
2130
2128
2126
2124
2122
2120
2118
2116
1+00 1+20 1+40 1+60 1+80 2+00 2+20 2+40 2+60 2+80 3+00 3+20 3+40 3+60 3+80 4+00 4+20 4+40
2124
2122
2120
2118
2116
2114
2112
2110
2108
2106
2104
2102
2100
2098
2096
2094
2092
2090
2088
2086
2084
2082
0+00 0+20 0+40 0+60 0+80 1+00 1+20 1+40 1+60 1+80 2+00 2+20
THIS DRAWING, INFORMATION AND SUBJECT MATTER ARE THE CONFIDENTIAL AND EXCLUSIVE PROPERTY OF
J-U-B ENGINEERS, INC.
AND ARE NOT TO BE COPIED, REPRODUCED, USED IN ANY MATTER WHATSOEVER, OR SUBMITTED TO OUTSIDE PARTIES WITHOUT THE WRITTEN CONSENT OF J-U-B ENGINEERS, INC.
RECORD DRAWINGS
2-5-93
Joel W. Petty P.E.
NO.
DESCRIPTION OF REVISION
BY
APPR
REFLECTION RIDGE SUBDIVISION
BAYVIEW, IDAHO
SEWER PROFILE
SEWER LINE "A2" AND "C" RECORD DWG
J-U-B ENGINEERS, INC.
Engineers Surveyors Planners
Coeur d'Alene, Idaho
ACAD.DWG FILE: BSEW2REC.DWGPLT.SC.
DES. MRL
DR. JFH
CH. MRL
SHEET 9
SCALE: VERT = 2' HORIZ = 20'
DATE: FEBRUARY, 1991
DWG.NO.
PROJECT NO.:
DATE\TIME OF PLOT:

RECORD DRAWINGS

2-5-93

Joel W. Petty P.E.

PROJECT NO.:

DATE/TIME OF PLOT:

NO.	DESCRIPTION OF REVISION	BY

REFLECTION RIDGE SUBDIVISION
BAYVIEW , IDAHO

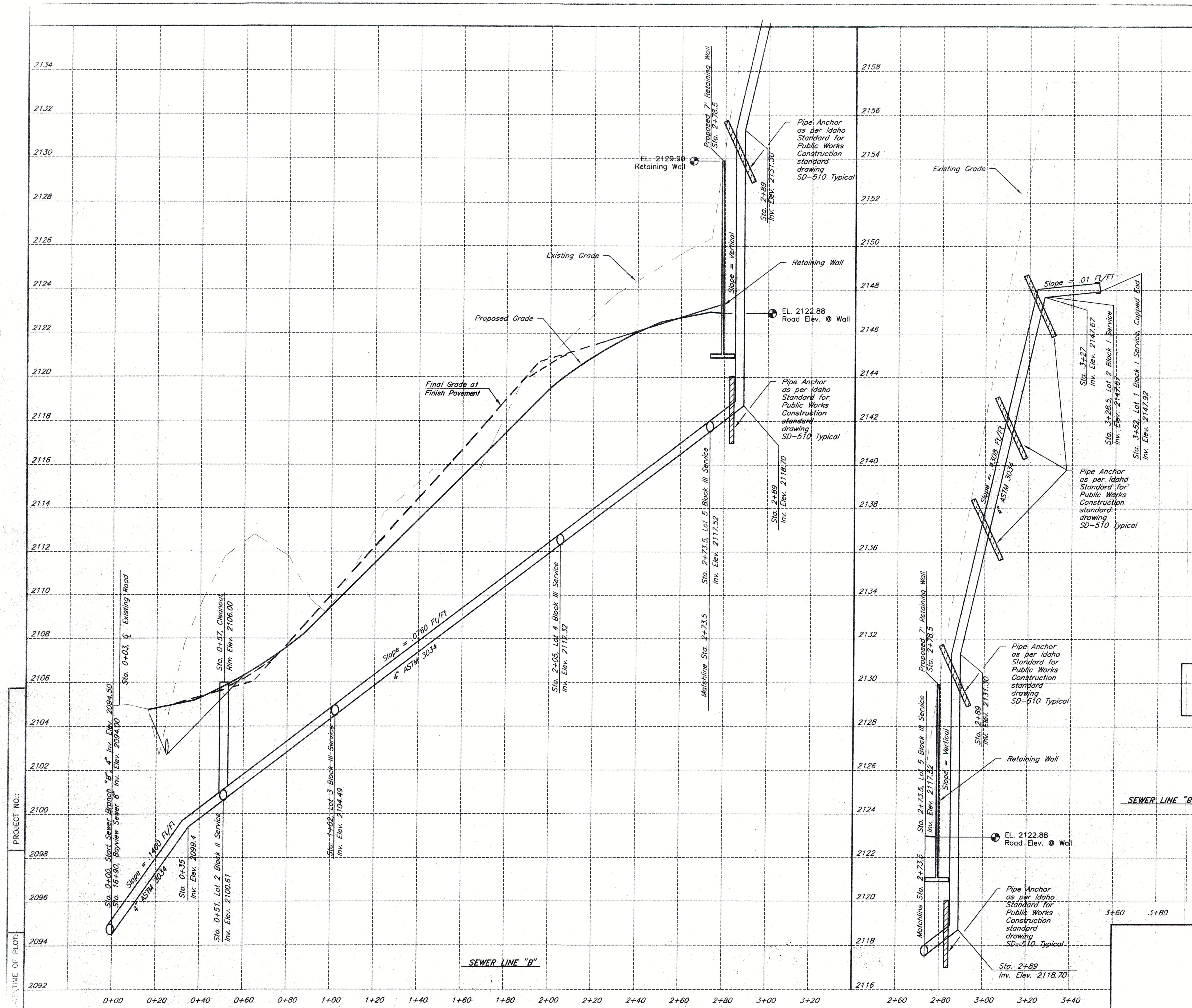
SEWER PROFILES – RECORD DWG
SEWER LINES "A" AND "A1"

J-U-B ENGINEERS,
Engineers Surveyors Planners
Coeur d'Alene, Idaho

ACAD.DWG FILE: MnbemREC.DwgPLT.SC

DES. MRL | DR. JfH | CH. MRL | SHEET

SCALE: AS SHOWN | DATE: FEBRUARY, 1991 | DWG.NO. C9



RECORD DRAWINGS

Joel W. Petty P.E.

PROJECT NO.:

TIME OF PLOT:

NO.	DESCRIPTION OF REVISION

REFLECTION RIDGE SUBDIVIS
BAYVIEW, IDAHO

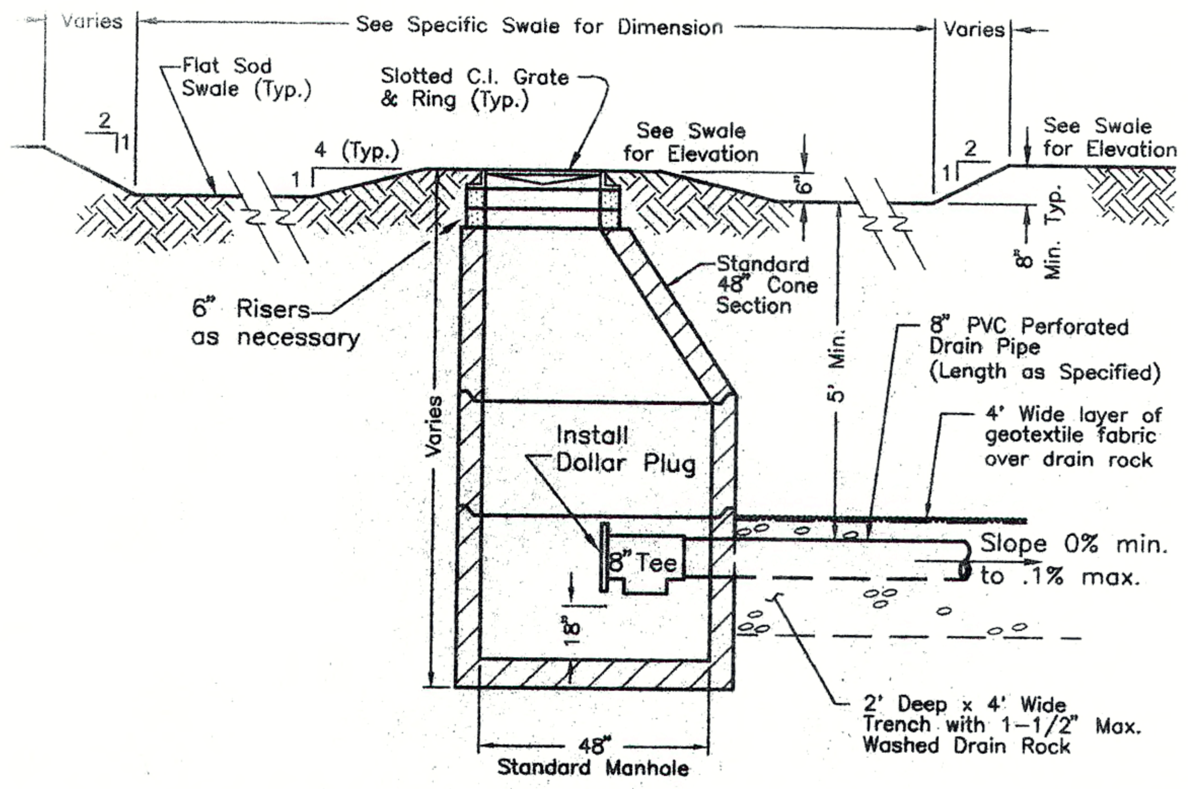
SEWER PROFILES
SEWER LINE "B" RECORD DRAW

J-U-B ENGINEERS
Engineers Surveyors Pl
Coeur d'Alene, Idah

ACAD.DWG FILE: SSTUBREC.DWG

DES. MRL | DR. JFH | CH. MRL

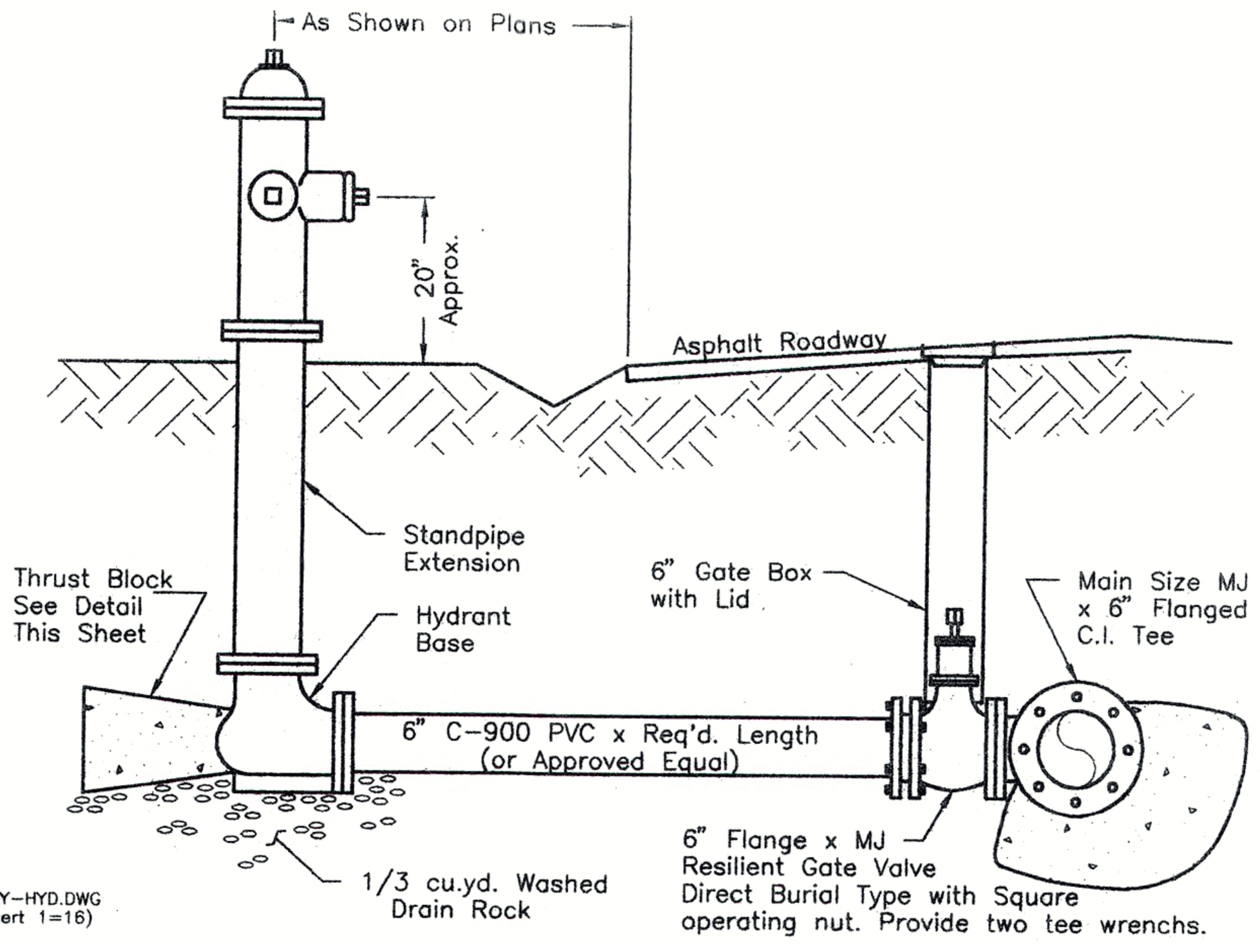
SCALE: AS SHOWN | DATE: MARCH, 1991



TYPICAL "208" PERCOLATION SWALE AND DRAIN PIPE INSTALLATION (1)

Scale: 3/8" = 1'-0"

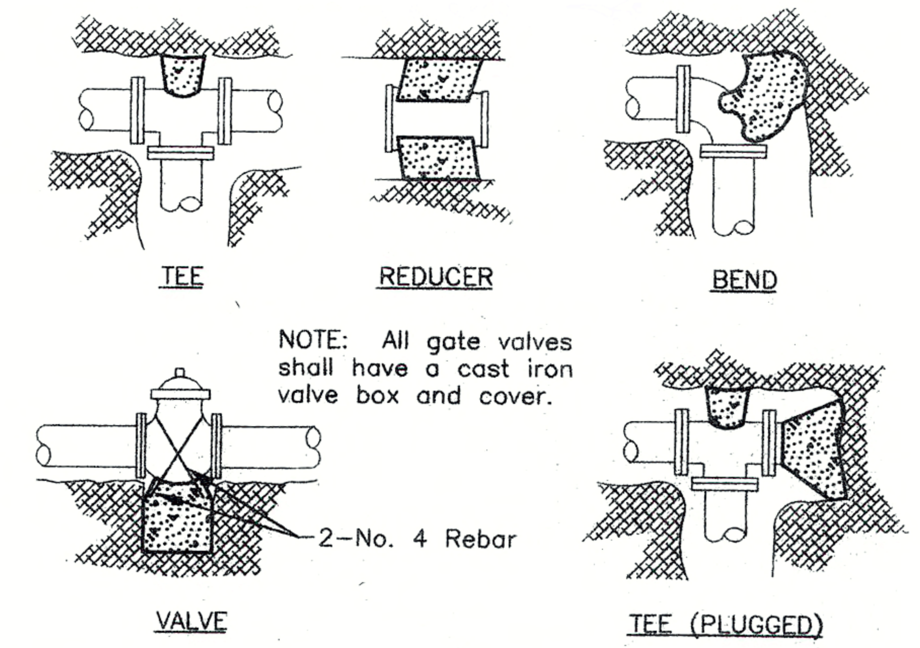
ACAD: BAY-SWAL.Dwg (plot/insert 1=32)



ACAD: BAY-HYD.DWG (plot/insert 1=16)

TYPICAL 6" FIRE HYDRANT SETTING (4)

Not to Scale



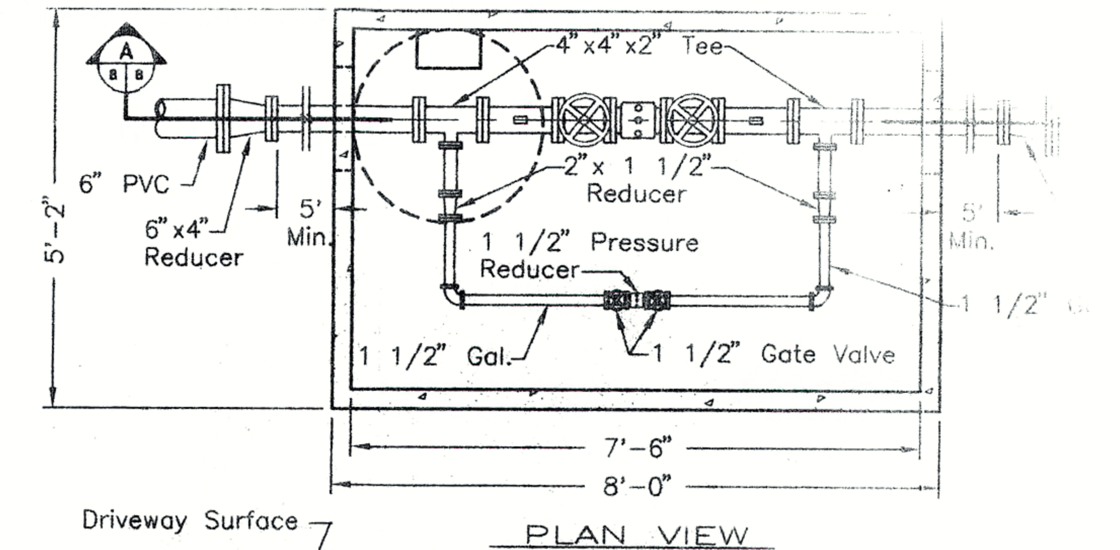
THRUST BLOCK AREA (Sq.FT.) Bearing Against Undisturbed Soil					
PIPE SIZES	TEES & PLUGS	90° BEND	45° BEND	22-1/2° & 11-1/2° BEND & REDUCER	GATE VALVES
3"	1.43	1.77	1.30	1.30	
4"	1.97	2.30	1.86	1.66	
6"	2.77	3.25	2.42	1.93	
8"	3.65	4.36	3.19	2.30	4.5
10"	4.16	5.54	4.06	2.89	7.25
12"	5.54	6.60	4.58	3.43	10.6
14"	6.83	8.15	5.85	4.05	14.4

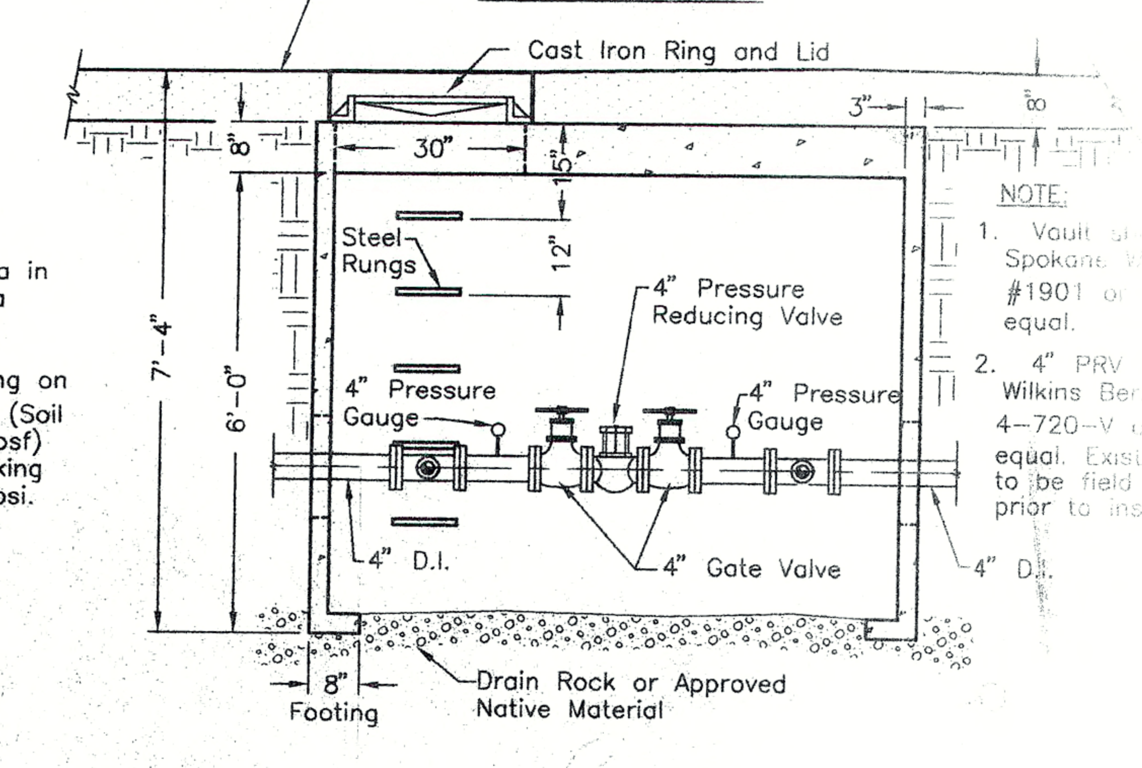
NOTES:
Thrust block area in square feet as a function of pipe size and type of fitting and bearing on undisturbed soil. (Soil bearing at 2000psf) Based on a working pressure of 150psi.

THRUST BLOCK DETAIL (6)

Not To Scale

ACAD: THRUST.DWG (PLOT/INSERT 1=1)

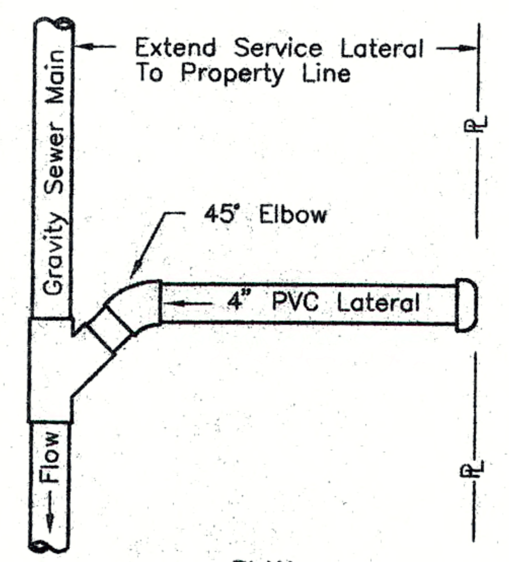


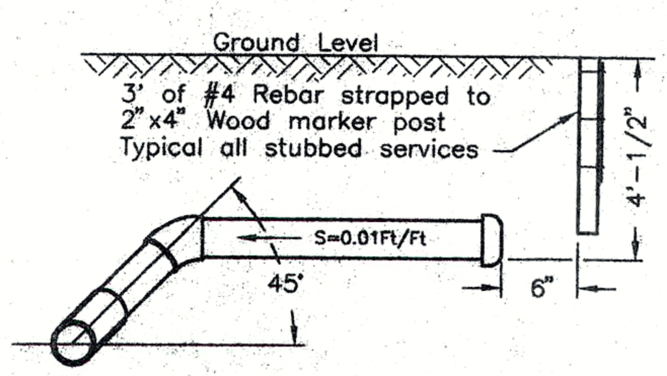


SECTION A-A

PRESSURE REDUCING STATION (7)

SCALE: 1/2" = 1'-0"

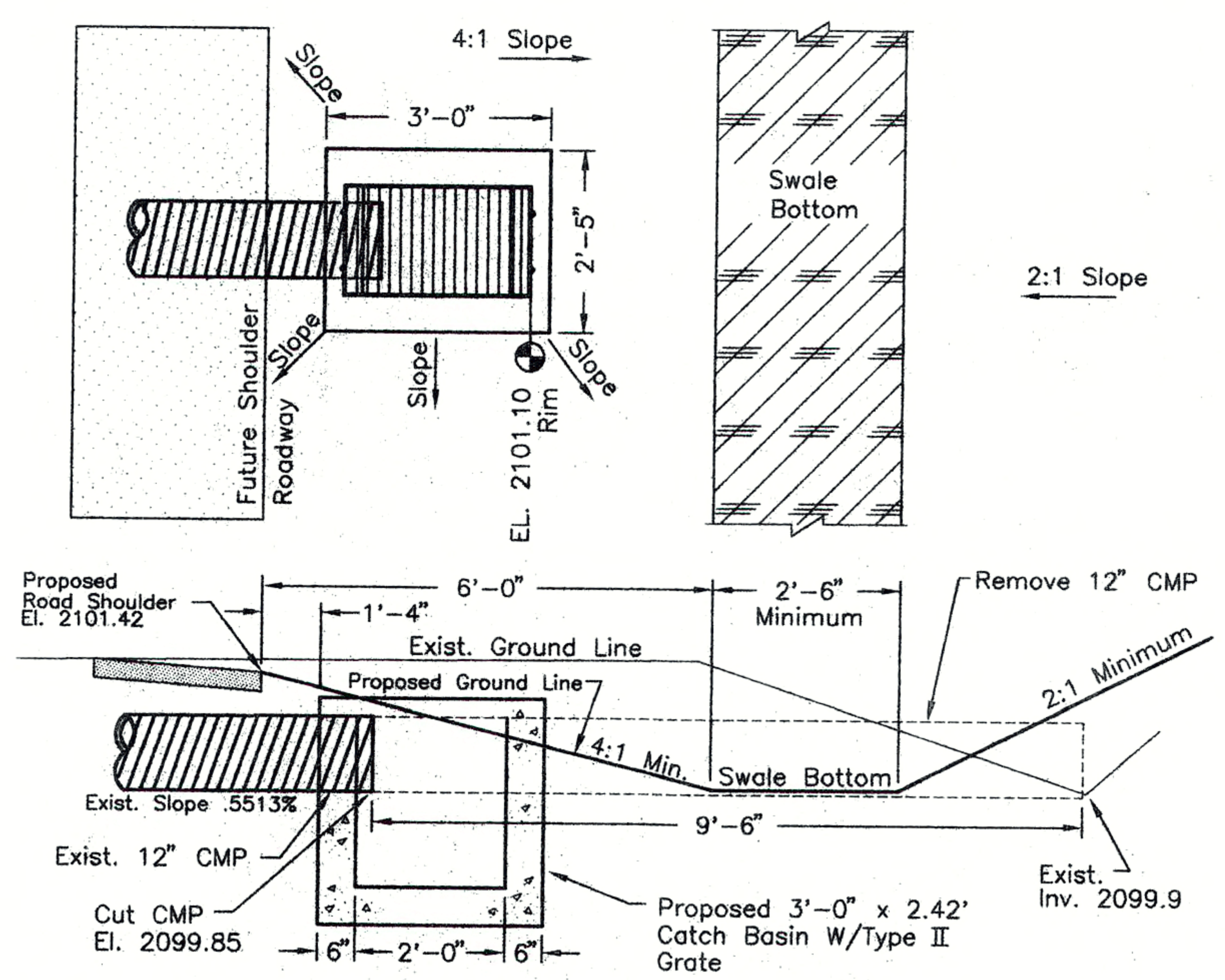




GRAVITY SERVICE LATERAL DETAIL (2)

NOT TO SCALE

ACAD: Grav-ser.Dwg (plot/insert 1=12)



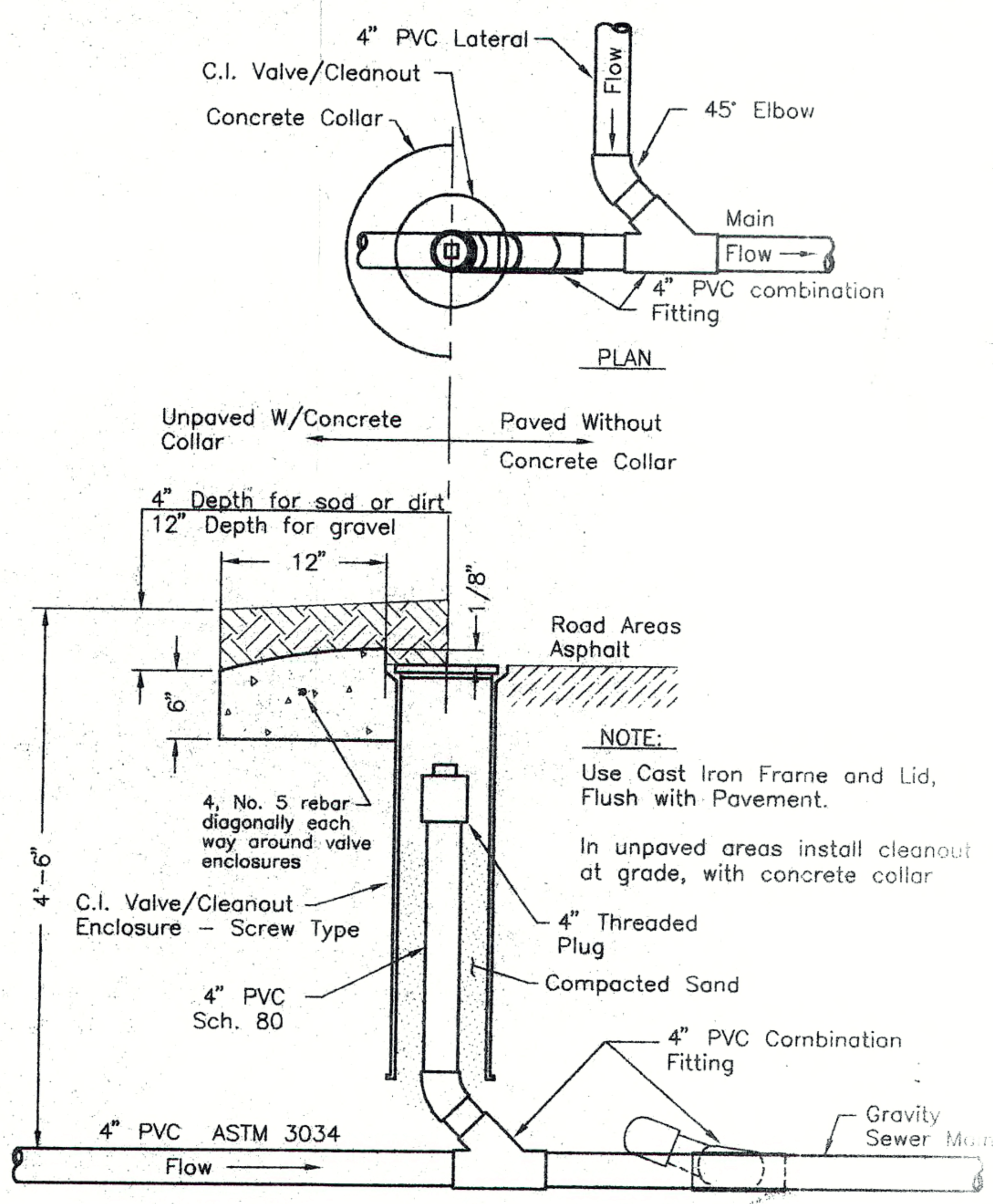
ACAD: Bay-cb.Dwg (plot/insert 1=24)

CATCH BASIN (5)

1/2" = 1'-0"

GENERAL NOTES

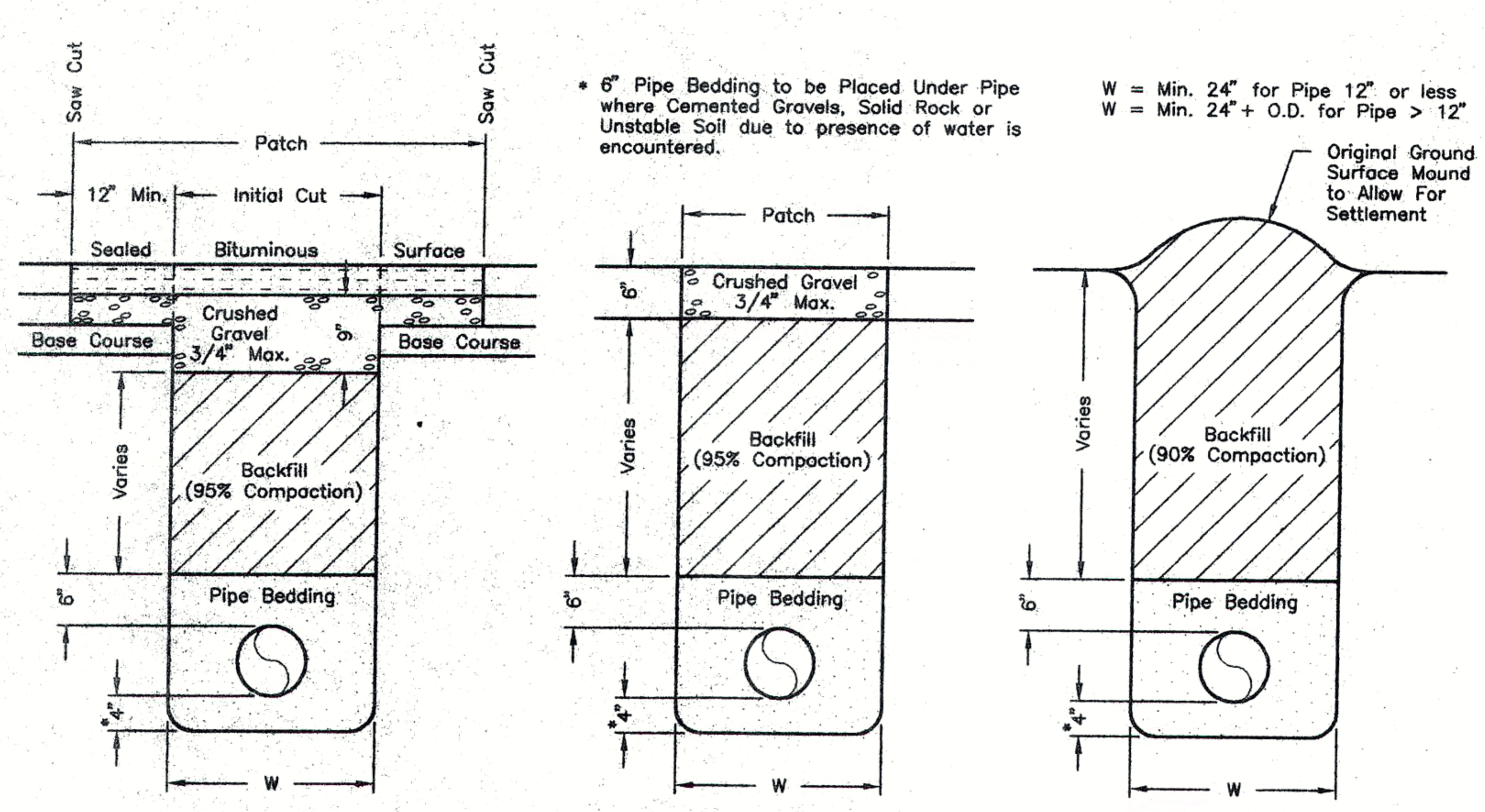
1. All water, sewer, storm sewer and road construction shall be in accordance with the 1990 Idaho Standards for Public Works Construction and/or the 1988 Highway Standards for the Associated Highway Districts, Kootenai County, Idaho.
2. Utility locations are plotted from the best available information. Actual field location may vay from the plans. It is the contractors responsibility to contact utility companies for actual locations. Ask operator for Zenith 9162.



ACAD: BAY-ClenDWG (plot/insert 1=12)

GRAVITY CLEANOUT (8)

NOT TO SCALE



TYPE "A" SURFACE REPAIR (Existing Bituminous Surface)

TYPE "B" SURFACE REPAIR (Existing Gravel Surface)

TYPE "C" SURFACE REPAIR

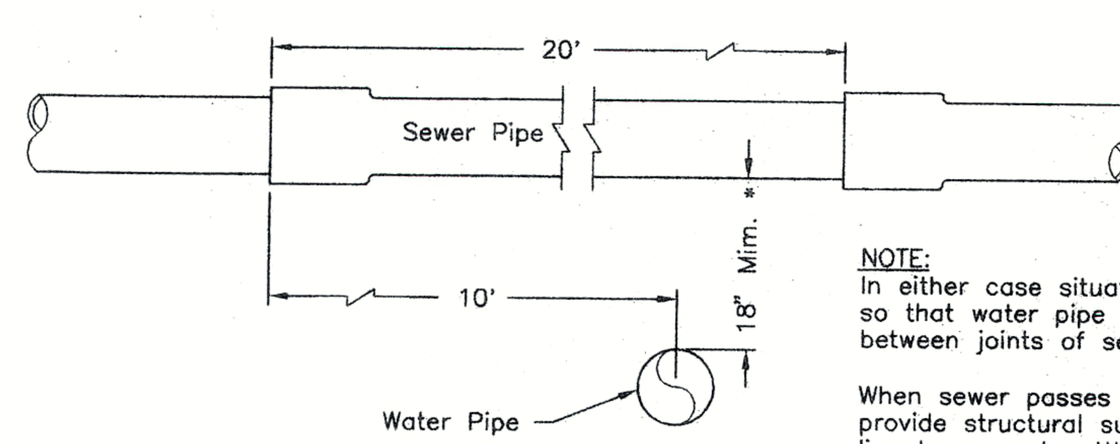
NOTES

1. All loose and foreign material shall be removed from the face of the existing bituminous surface-cut.
2. Any fractured bituminous surface beyond the face of the surface-cut shall be removed.
3. The face of the bituminous surface-cut must be primed before applying patch.
4. Patch shall not overlap the existing bituminous surface.
5. The patch thickness shall be four (4) inches or equal to the existing asphalt thickness, whichever is greater.

TRENCH BACKFILL & SURFACE REPAIR (3)

NOT TO SCALE

DISK: "SEWER-1" ACAD: BCK-SURF.Dwg (plot/insert 16)

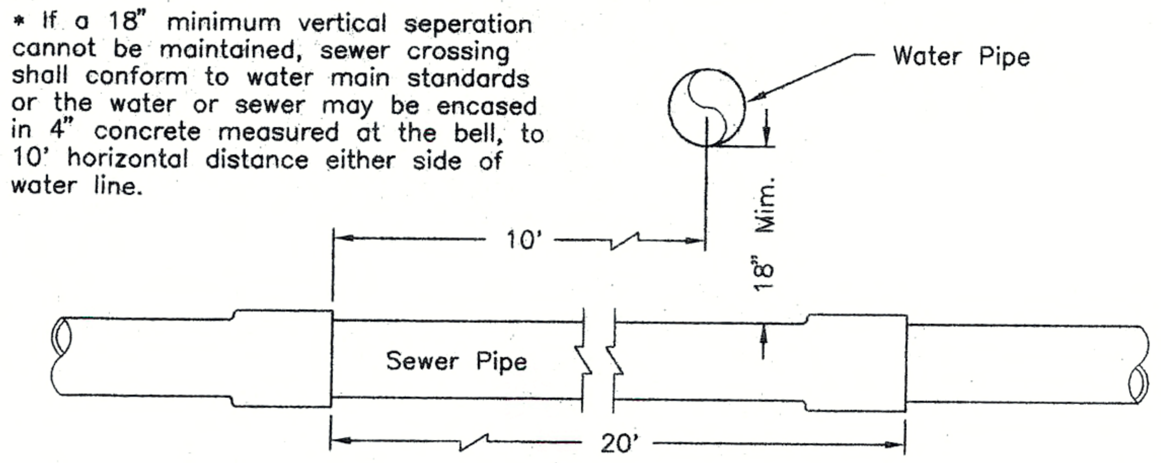


NOTE:
In either case situate sewer piping so that water pipe is centered between joints of sewer pipe.

When sewer passes underneath water provide structural support for water line to prevent settlement or breakage.

SEWER CROSSING OVER WATER

* If a 18" minimum vertical seperation cannot be maintained, sewer crossing shall conform to water main standards or the water or sewer may be encased in 4" concrete measured at the bell, to 10' horizontal distance either side of water line.



SEWER CROSSING UNDER WATER

WATER / SEWER CROSSING DETAIL (9)

NOT TO SCALE

ACAD: Wat-Sew.Dwg (plot/insert: 1=16)

RECORD DRAWINGS

2-5-93

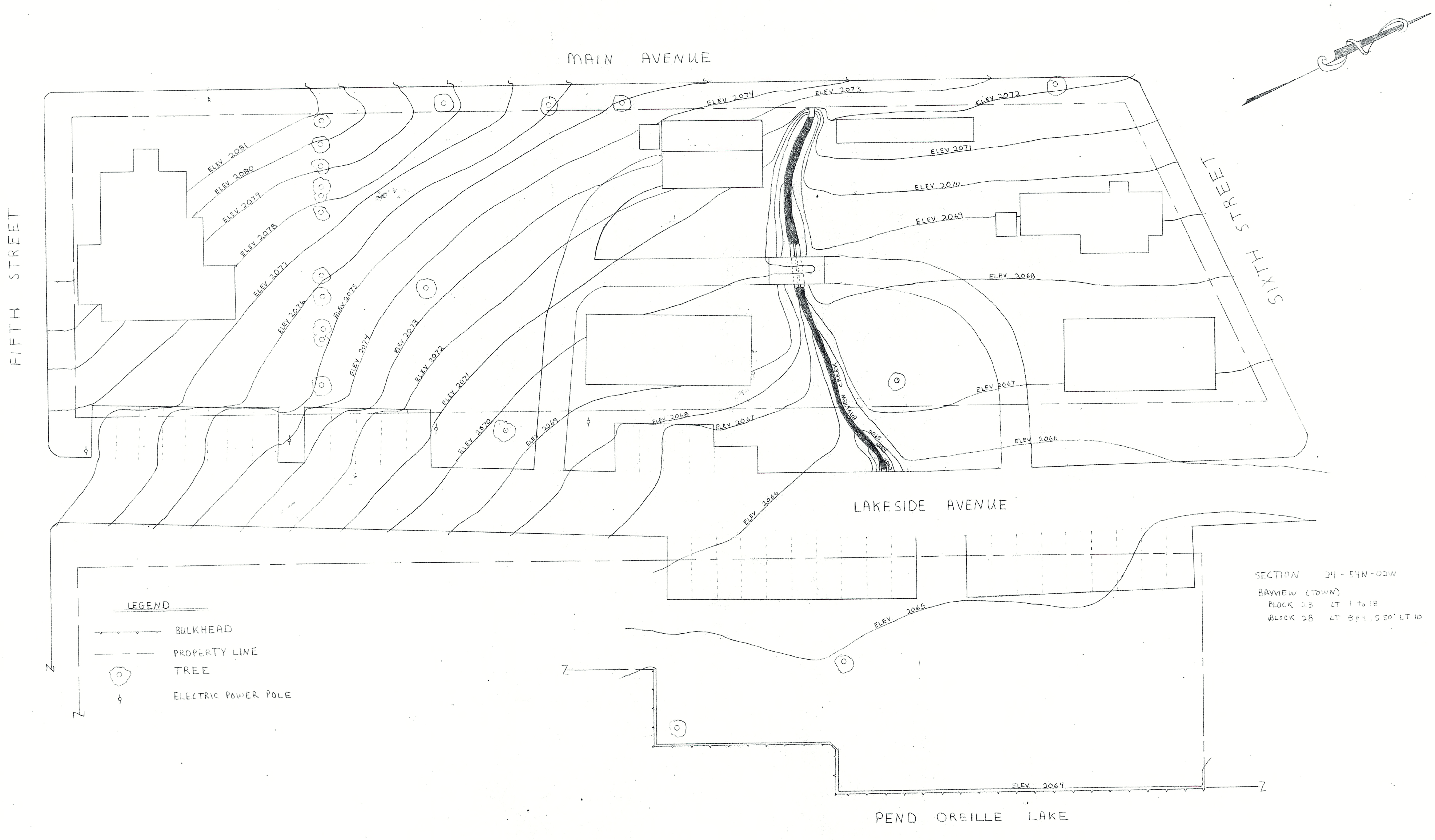
Joel W. Petty P.E.

REFLECTION RIDGE SUBDIVIS...
BAYVIEW, IDAHO

CONSTRUCTION DETAILS - RECORD DRAWING

J-U-B ENGINEERS, ...
Engineers Surveyors Plan...
Coeur d'Alene, Idah...

ACAD.DWG FILE: BDETREC.DWG			
DES. JP	DR. DpS	CH. JP	SH...
SCALE: AS SHOWN	DATE: FEBRUARY, 1991	DWG.N...	



Dale W. Peck

DALE W. PECK
PROFESSIONAL ENGINEER
BOX 299
BAYVIEW, IDAHO 83803
(208) 683-3359

SHEET 1 OF 6

EXISTING CONDITIONS
AND TOPOGRAPHY

RECREATIONAL VEHICLE PARK
BOILEAU'S RESORT
BAYVIEW, IDAHO

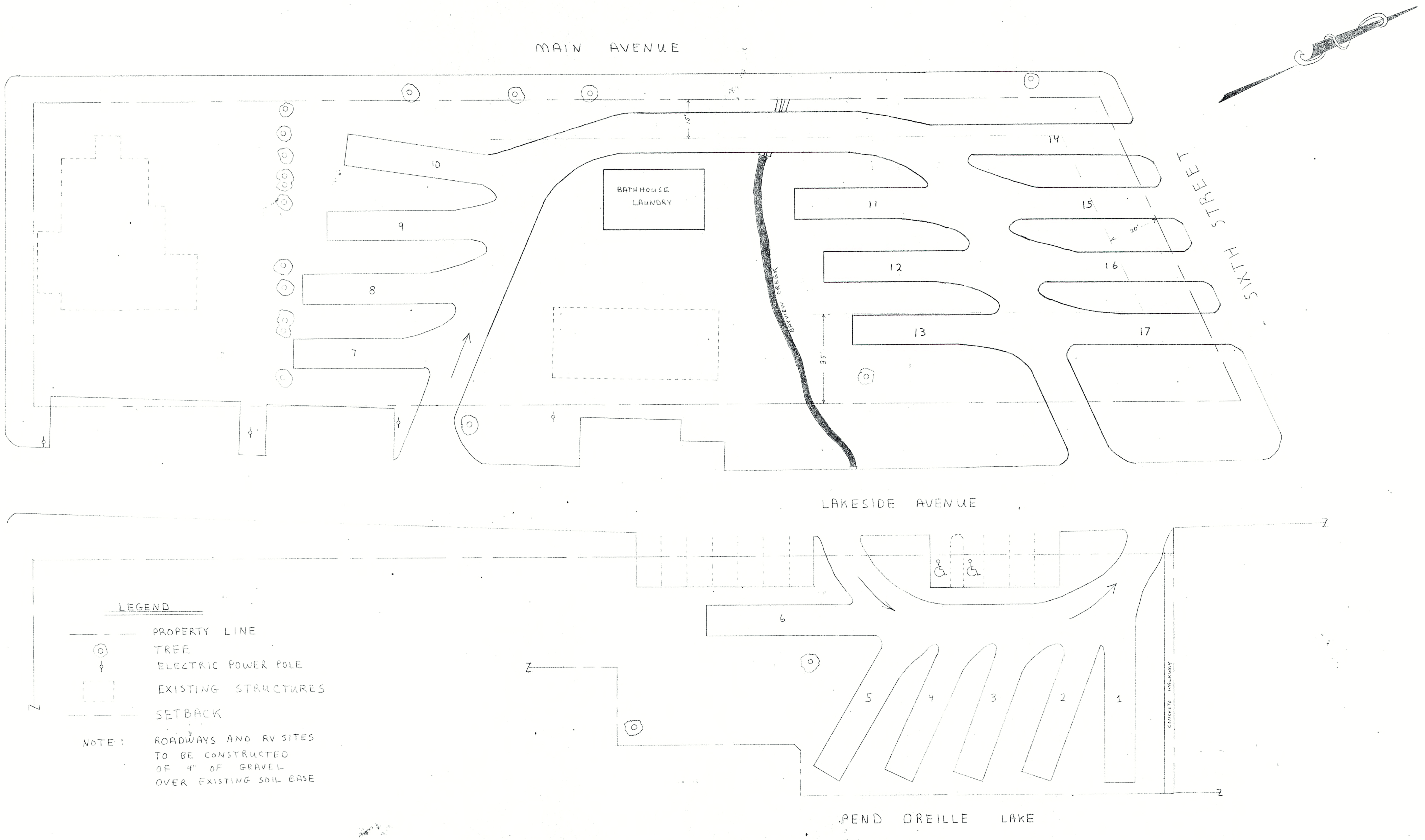
REVISIONS		
NO	DATE	DESCRIPTION

DATE: 8/31/94
SCALE: 1" = 20'
DRAWN: D. PECK

SHEET
1 OF 6


MAIN AVENUE
FIFTH STREET
SIXTH STREET
LAKESIDE AVENUE
PEND OREILLE LAKE
BAYVIEW CREEK
10
9
8
7
6
5
4
3
2
1
15'
35'
LEGEND
BULKHEAD
PROPERTY LINE
TREE
ELECTRIC POWER POLE
EXISTING STRUCTURES
SETBACK
NOTE: ROADWAYS AND RV SITES TO BE CONSTRUCTED OF 4" OF GRAVEL OVER EXISTING SOIL BASE
TYPICAL RV SITE
LENGTH VARIES
RV PARKING
12'
TOW VEHICLE PARKING
13'
ALL SITES ACCESSABLE TO HANDICAPPED
DALE W. PECK
PROFESSIONAL ENGINEER
BOX 299
BAYVIEW, IDAHO 83803
(208) 683-3859
SHEET 2 OF 6
PHASE ONE SITE PLAN
RECREATIONAL VEHICLE PARK
BOILEAU'S RESORT
BAYVIEW, IDAHO
REVISIONS
NO
DATE
DESCRIPTION
DATE: 9/5/04
SCALE: 1"=20'
DRAWN: D. PECK
SHEET
2 OF 6
Dale W. Peck

MAIN AVENUE
FIFTH STREET
SIXTH STREET
LAKESIDE AVENUE
PEND OREILLE LAKE
NO CONSTRUCTION IN THIS AREA DURING PHASE ONE
NOTE: PLEASE SEE THE STORMWATER MANAGEMENT PLAN FOR DESIGN CALCULATIONS
ROOF GUTTER REQUIRED
GIA #1 ELEV 63.0
GIA #2 ELEV 70.0
GIA #3 ELEV 69.5
LEGEND
BULKHEAD
PROPERTY LINE
CONSTRUCTION LIMIT LINE
GIA DRAINAGE AREA
CONCRETE DRAINAGE DITCH
GRASSED INFILTRATION AREA (GIA) CROSS SECTION
TOP WIDTH
TOUGH LAWN MIX
SHALLOW DEPTH AND WELL DRAINING SOIL WILL ALLOW USE OF NORMAL LAWN MIX
CONCRETE DRAINAGE DITCH CROSS SECTION
SCALE 1" = 1'
GALV. STEEL GRATE TO MEET 20K lb AXL LOADING
PRECAST CONCRETE
DALE W. PECK
PROFESSIONAL ENGINEER
BOX 299
BAYVIEW, IDAHO 83803
(208) 683-3859
PHASE ONE EROSION/ SEDIMENTATION CONTROL PLAN and FINAL GRADING
RECREATIONAL VEHICLE PARK
BOILEAU'S RESORT
BAYVIEW, IDAHO
REVISIONS
NO DATE DESCRIPTION
DATE 9/8/94
SCALE: 1" = 20'
DRAWN: D PECK
SHEET 3 OF 6



SHEET 4 OF 6

DALE W PECK
PROFESSIONAL ENGINEER
BOX 299
BAYVIEW, IDAHO 83803
(208) 683-3859

PHASE TWO SITE PLAN

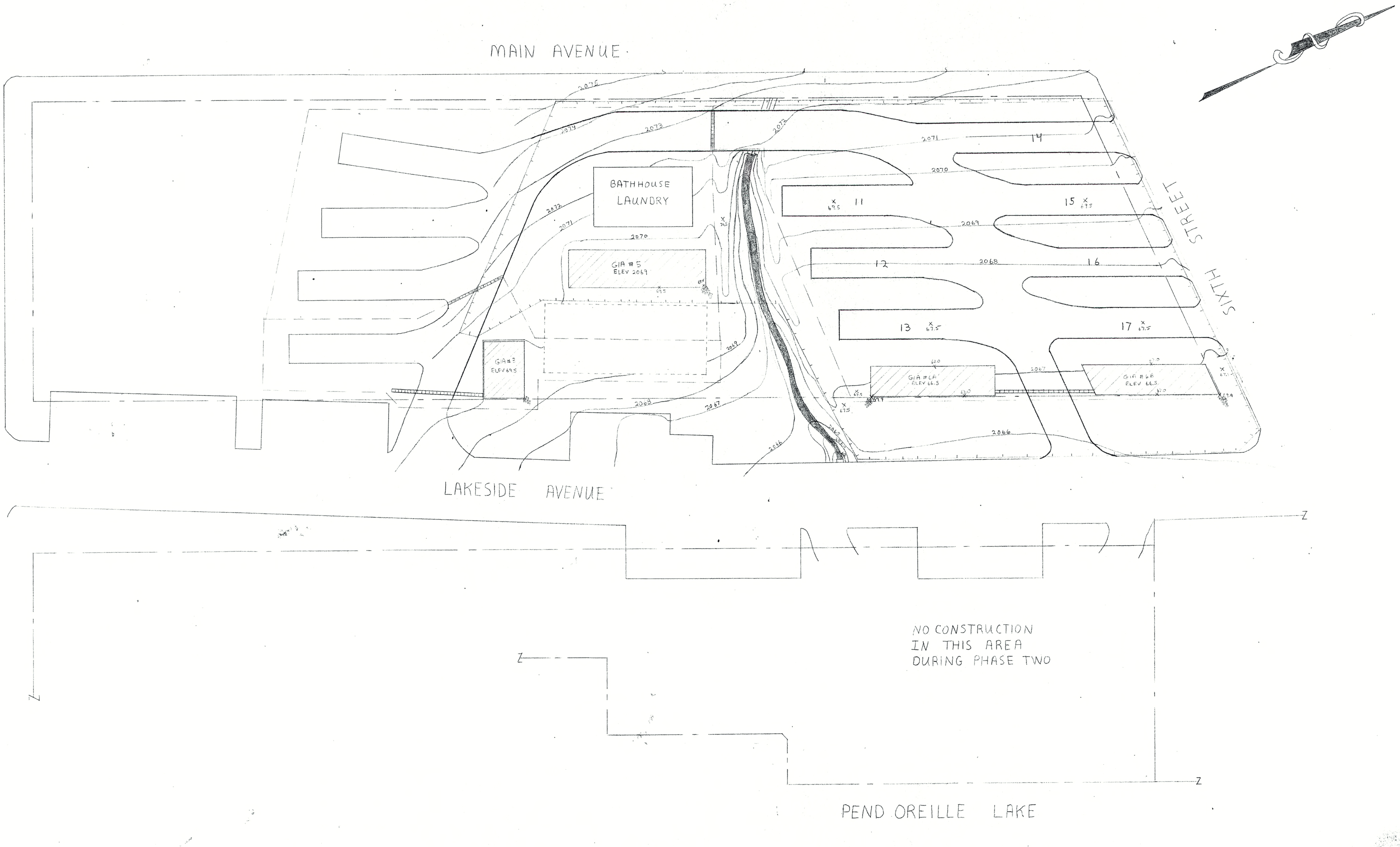
RECREATIONAL VEHICLE PARK
BOILEAU'S RESORT
BAYVIEW, IDAHO

REVISIONS		
NO	DATE	DESCRIPTION

DATE: 9/6/94
SCALE: 1" = 20'
DRAWN: D PECK

SHEET 4 OF 6

Dale W Peck



SHEET 5 OF 6

DALE W. PECK
PROFESSIONAL ENGINEER
BOX 290 BAYVIEW IDAHO 83803
(208) 683-3859

PHASE TWO EROSION/ SEDIMENTATION CONTROL PLAN and FINAL GRADING

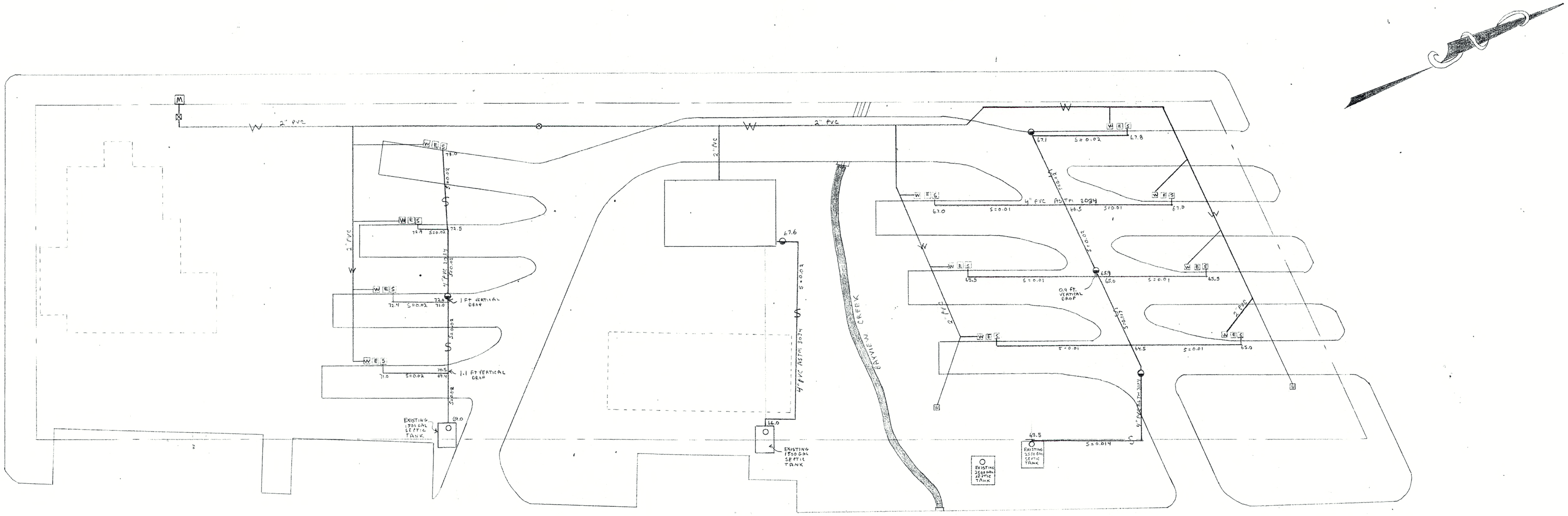
RECREATIONAL VEHICLE PARK
BOILEAU'S RESORT
BAYVIEW, IDAHO

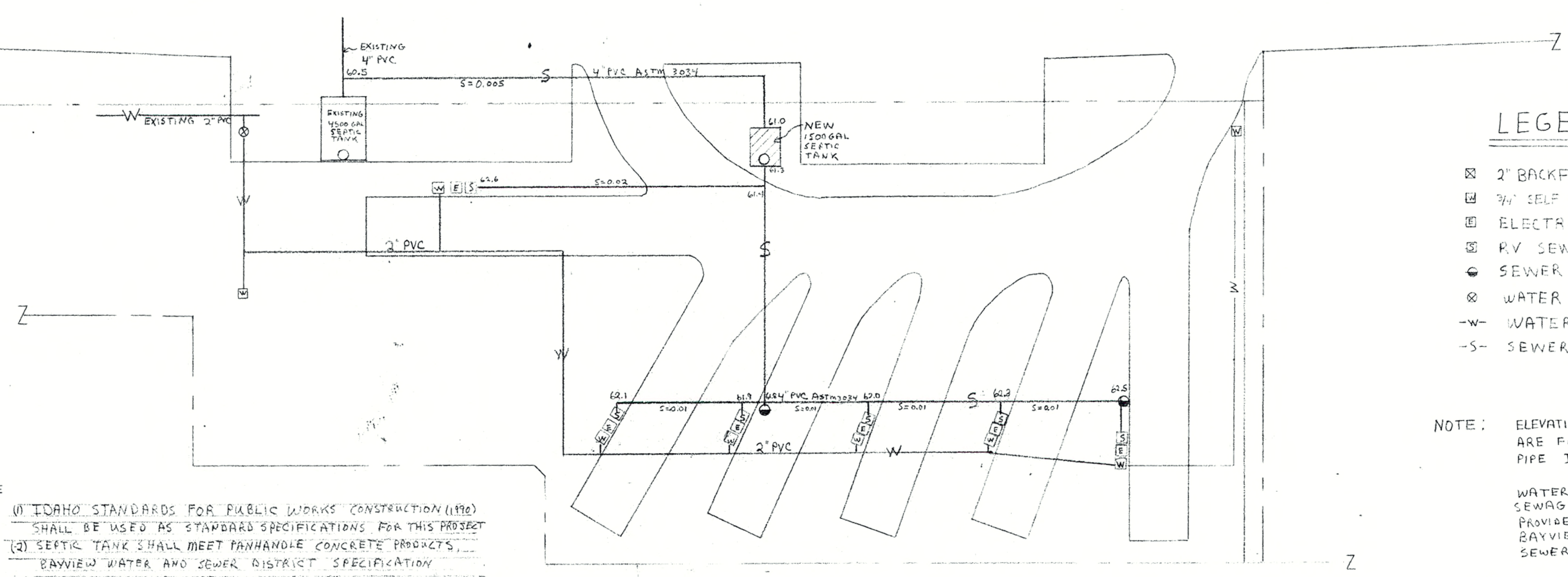
REVISIONS		
NO	DATE	DESCRIPTION

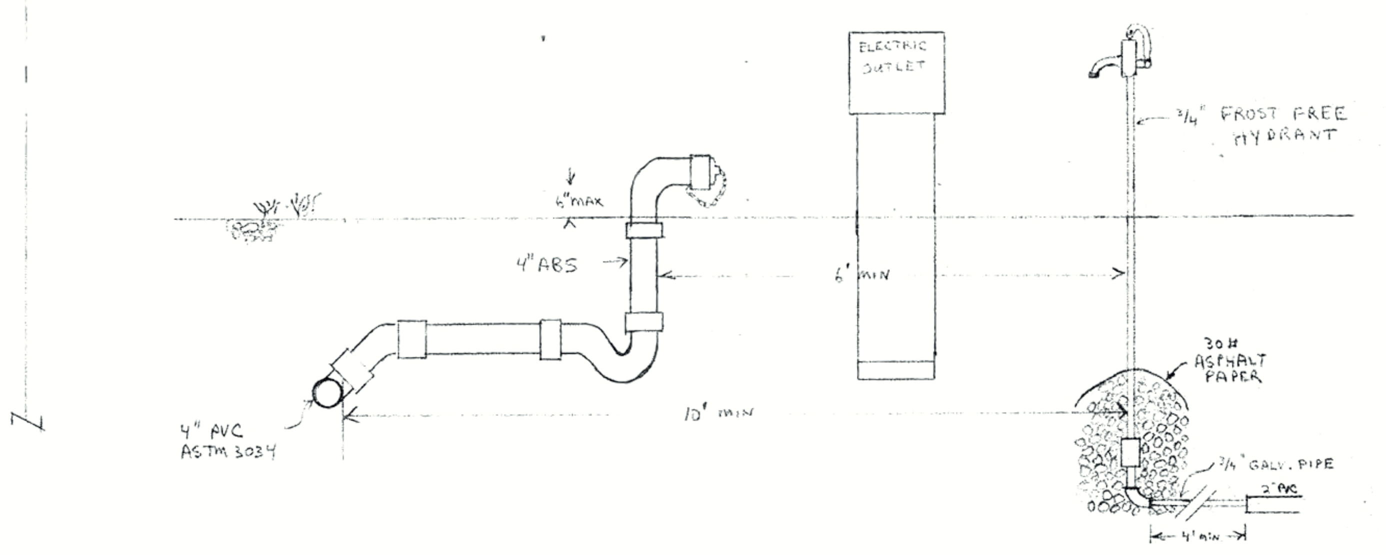
DATE 9/9/94
SCALE: 1"=20'
DRAWN: D.PECK

Dale W. Peck

SHEET 5 OF 6







UTILITY DETAIL

NOTE

(1) IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION (1990) SHALL BE USED AS STANDARD SPECIFICATIONS FOR THIS PROJECT
(2) SEPTIC TANK SHALL MEET PANHANDLE CONCRETE PRODUCTS, BAYVIEW WATER AND SEWER DISTRICT SPECIFICATION
(3) SEPTIC TANK FILTER: ORENCO F 15" X 48" W/ 2" PVC DISCHARGE HOSE, HOSE SHALL BE 5½' IN LENGTH PLUS INCH FOR INCH FOR TANK RISER IN EXCESS OF 24" IN HEIGHT.
(4) ALL SECONDARY ELECTRICAL POWER WILL BE UNDERGROUND

LEGEND

- ⊠ 2" BACKFLOW PREVENTER
- W 3/4" SELF DRAINING HYDRANT
- E ELECTRICAL OUTLET
- S RV SEWER CONNECTION
- SEWER CLEANOUT
- ⊗ WATER SHUTOFF VALVE
- -W- WATER LINE
- -S- SEWER LINE

NOTE: ELEVATIONS GIVEN ARE FOR SEWER PIPE INVERTS

WATER AND SEWAGE TREATMENT PROVIDED BY BAYVIEW WATER AND SEWER DISTRICT

Dale W. Peck

DALE W. PECK
PROFESSIONAL ENGINEER
BOX 299
BAYVIEW IDAHO 83803
(208) 683-3859

UTILITY PLAN

RECREATIONAL VEHICLE PARK
BOILEAU'S RESORT
BAYVIEW, IDAHO

REVISIONS		
NO	DATE	DESCRIPTION

DATE 9/12/94
SCALE: 1" = 20'
DRAWN: D. PECK

SHEET 6 OF 6

1. SEE DETAIL A
STA: 10+00.00
OFFSET: 0.00R
(1) 6"x6"x6" TEE MJxMJxFL
(1) 6" GATE VALVES FLxMJ
(2) 6" COUPLINGS
W/ THRUST BLOCKING

2. STA: 11+58.19
OFFSET: 6.00 L
SEWER CLEAN OUT

3. STA: 22+73.67
OFFSET: 38.25 R
2" BLOW-OFF ASSEMBLY

4. STA: 22+70.63
OFFSET: 34.74 R
(1) 6" GATE VALVE MJ
W/ THRUST BLOCKING

5. STA: 22+51.65
OFFSET: 12.77 R
(1) 6" 45°BEND MJ
W/ THRUST BLOCKING

6. STA: 21+18.96 OFFSET: 10.38 R
(1) 6" 22.5°BEND MJ
W/ THRUST BLOCKING

7. STA: 20+40.72
OFFSET: 10.12 R
(1) 6" 22.5° BEND MJ
W/ THRUST BLOCKING

8. WATER/ SEWER CROSSING SHALL COMPLY W/ IDEQ REQUIREMENTS. SEE NOTE 4, SHEET WS5.

9. EXISTING GATE VALVE TO BE CLOSED FOR CUTTING AND INSTALLATION OF NEW TEE. SEE NOTE 3 THIS SHEET.

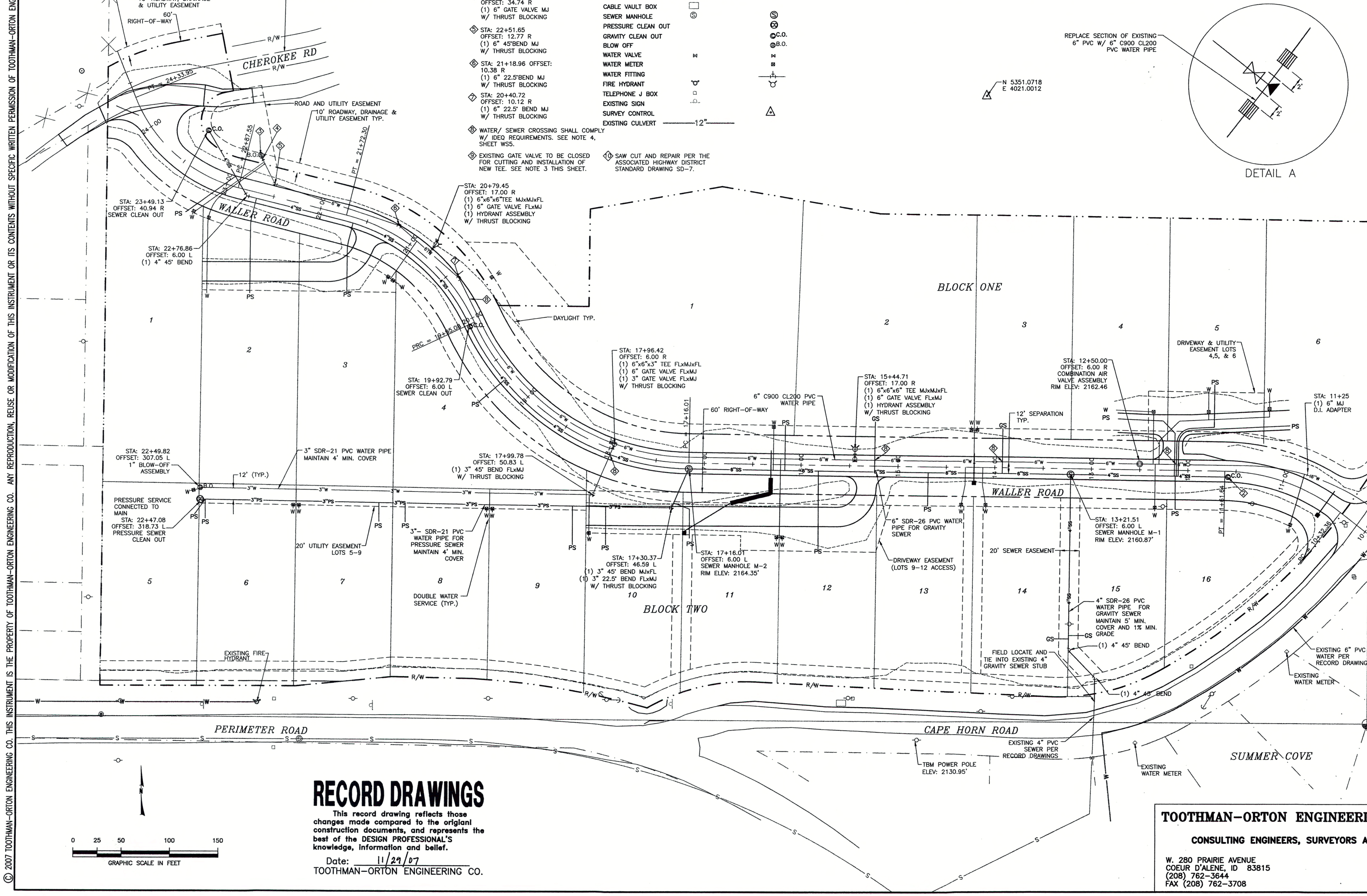
10. SAW CUT AND REPAIR PER THE ASSOCIATED HIGHWAY DISTRICT STANDARD DRAWING SD-7.

LEGEND

	EXISTING	PROPOSED
RIGHT-OF-WAY	R/W	
GRAVEL ROAD		
PAVEMENT		
DAYLIGHT LINE		
2' CONTOUR	2220	2210
SEWER	S	4"SS
PRESSURE SEWER		3"PS
WATER	W	6"W
POWER POLE		
CABLE VAULT BOX		
SEWER MANHOLE		
PRESSURE CLEAN OUT		
GRAVITY CLEAN OUT		C.O.
BLOW OFF		B.O.
WATER VALVE		
WATER METER		
WATER FITTING		
FIRE HYDRANT		
TELEPHONE J BOX		
EXISTING SIGN		
SURVEY CONTROL		
EXISTING CULVERT	12"	

NOTES:

1. ALL WORK SHALL CONFORM TO THE MOST CURRENT EDITION OF THE IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION (ISPWC) AS AMENDED, SUPPLEMENTED OR MODIFIED HEREIN.
2. FOR WATER AND SEWER NOTES SEE, SHEET WS5.
3. THE CONTRACTOR SHALL CONTACT THE BAYVIEW WATER AND SEWER DISTRICT PRIOR TO BEGINNING WATER AND SEWER CONSTRUCTION.
4. EXISTING UTILITIES AND UNDERGROUND PIPING ARE SHOWN IN AN APPROXIMATE LOCATION. NO GUARANTEE IS MADE OR IMPLIED THAT ALL EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION AND LOCATION OF ALL UTILITIES AND UNDERGROUND PIPING. THE CONTRACTOR SHALL CONTACT KOOTENAI COUNTY ONE CALL (1-800-428-4950) AT LEAST 48 HOURS PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES AND STRUCTURES.



RECORD DRAWINGS

This record drawing reflects those changes made compared to the original construction documents, and represents the best of the DESIGN PROFESSIONAL'S knowledge, information and belief.

Date: 11/29/07

TOOTHMAN-ORTON ENGINEERING CO.

TOOTHMAN-ORTON ENGINEERING COMPANY

CONSULTING ENGINEERS, SURVEYORS AND PLANNERS

W. 280 PRAIRIE AVENUE
COEUR D'ALENE, ID 83815
(208) 762-3644
FAX (208) 762-3708

OFFICES IN:
BOISE, IDAHO
CALDWELL, IDAHO

REVISIONS			
NO.	ITEM	DATE	E-FILE NAME
1	RECORD DRAWINGS	11/29/07	PL-PR.DWG

DESIGNED	GES
DRAWN	GES
CHECKED	SM
APPROVED	SM

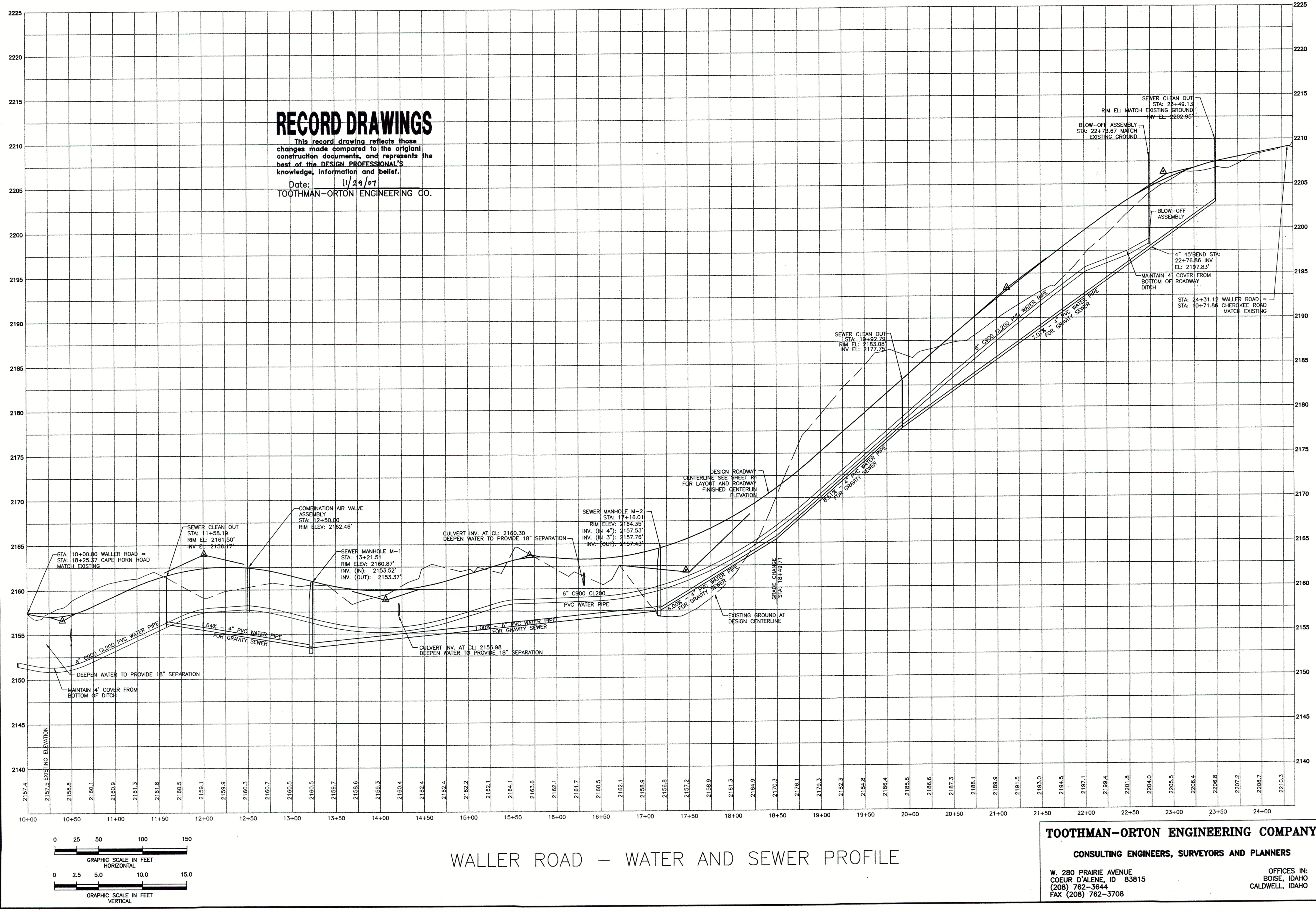
PROFESSIONAL ENGINEER, REGISTERED 8835, 11/29/07, STATE OF IDAHO, SCOTT G. MCNEE

ES ENGINEERING
11917 HIDDEN VALLEY ROAD
RATHDRUM, ID 83858
PH./FAX (208) 687-7002

BAYWATCH ESTATES
BAYVIEW, IDAHO
WALLER ROAD
WATER AND SEWER PLAN

DATE: JANUARY 2007
PROJECT: 0348

SHEET WS1 OF 6



WALLER ROAD – WATER AND SEWER PROFILE

TOOTHMAN-ORTON ENGINEERING COMPANY
CONSULTING ENGINEERS, SURVEYORS AND PLANNERS
W. 280 PRAIRIE AVENUE
COEUR D'ALENE, ID 83815
(208) 762-3644
FAX (208) 762-3708
OFFICES IN: BOISE, IDAHO CALDWELL, IDAHO

PROFESSIONAL ENGINEER REGISTERED 8835 11/29/07 STATE OF IDAHO SCOTT G. MCKEE

E-FILE NAME	PL-PR.DWG
DESIGNED	GES
DRAWN	GES
CHECKED	SM
APPROVED	SM

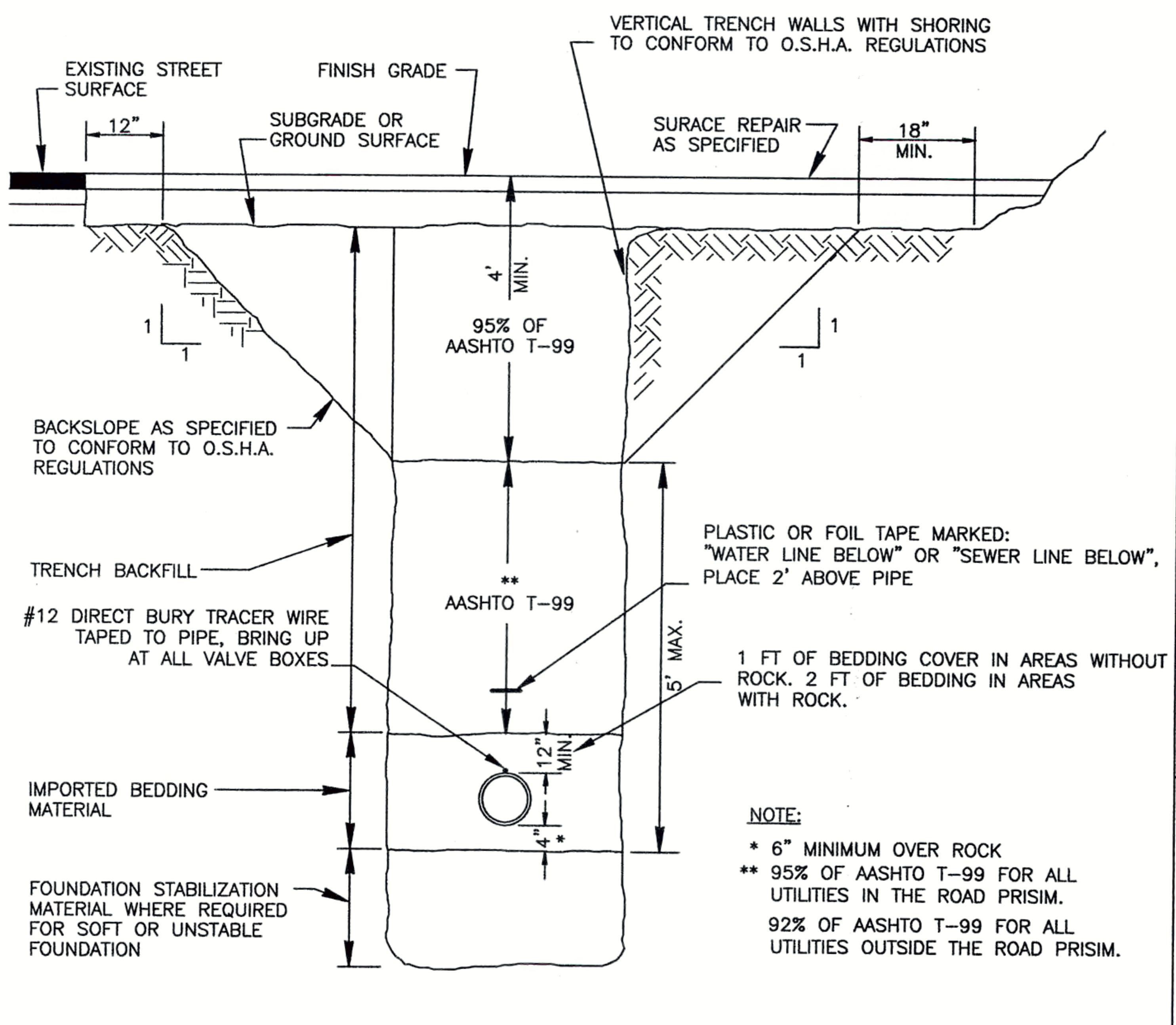
REVISIONS

NO.	ITEM	DATE
1	RECORD DRAWINGS	11/29/07

ES ENGINEERING
11917 HIDDEN VALLEY ROAD
RATHDRUM, ID 83858
PH./FAX (208) 687-7002

BAYWATCH ESTATES
BAYVIEW, IDAHO
WALLER ROAD
WATER AND SEWER PROFILE

DATE: JANUARY 2007
PROJECT: 034B
SHEET WS2 OF 6



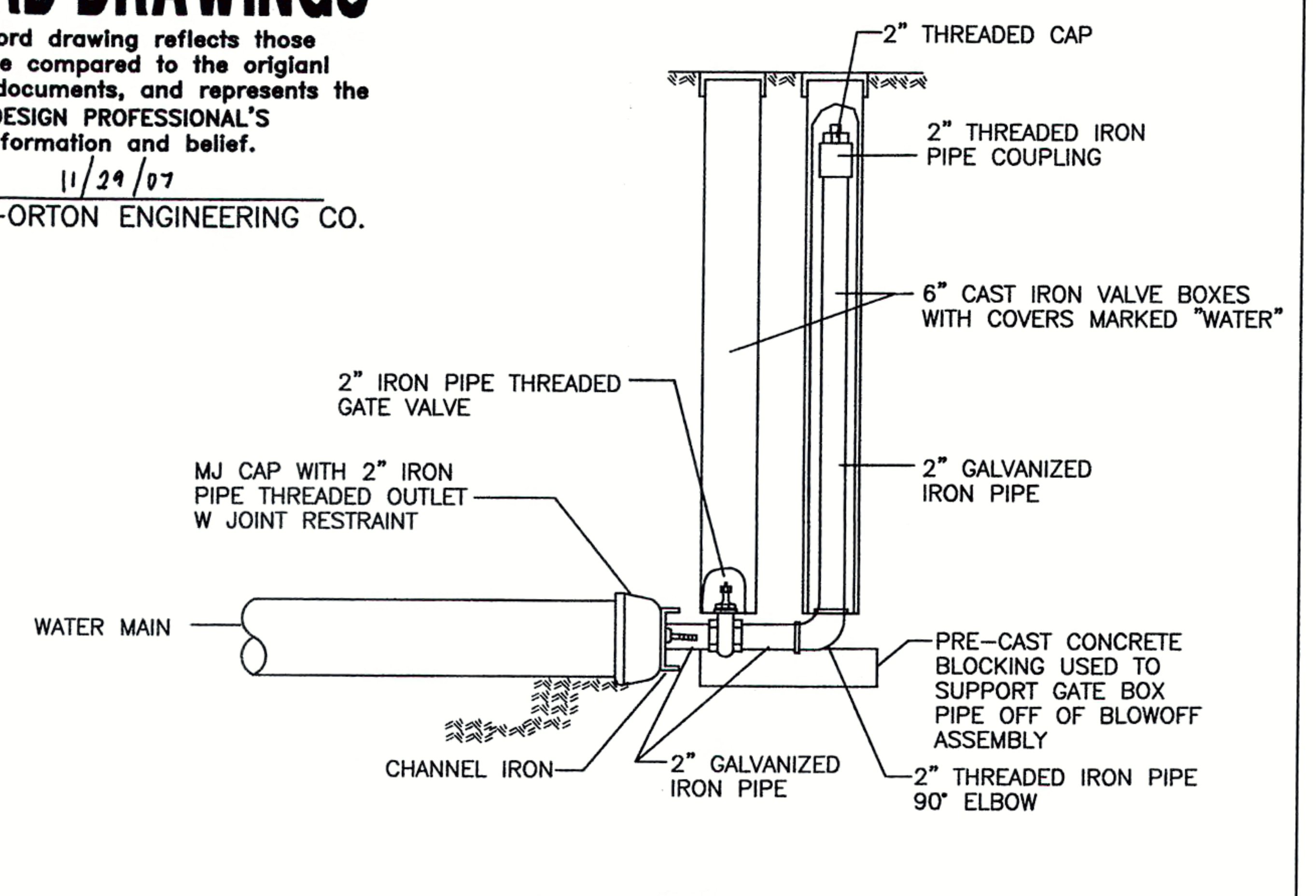
NOTE:
* 6" MINIMUM OVER ROCK
** 95% OF AASHTO T-99 FOR ALL UTILITIES IN THE ROAD PRISIM.
92% OF AASHTO T-99 FOR ALL UTILITIES OUTSIDE THE ROAD PRISIM.

TYPICAL TRENCH DETAIL
SCALE: NONE

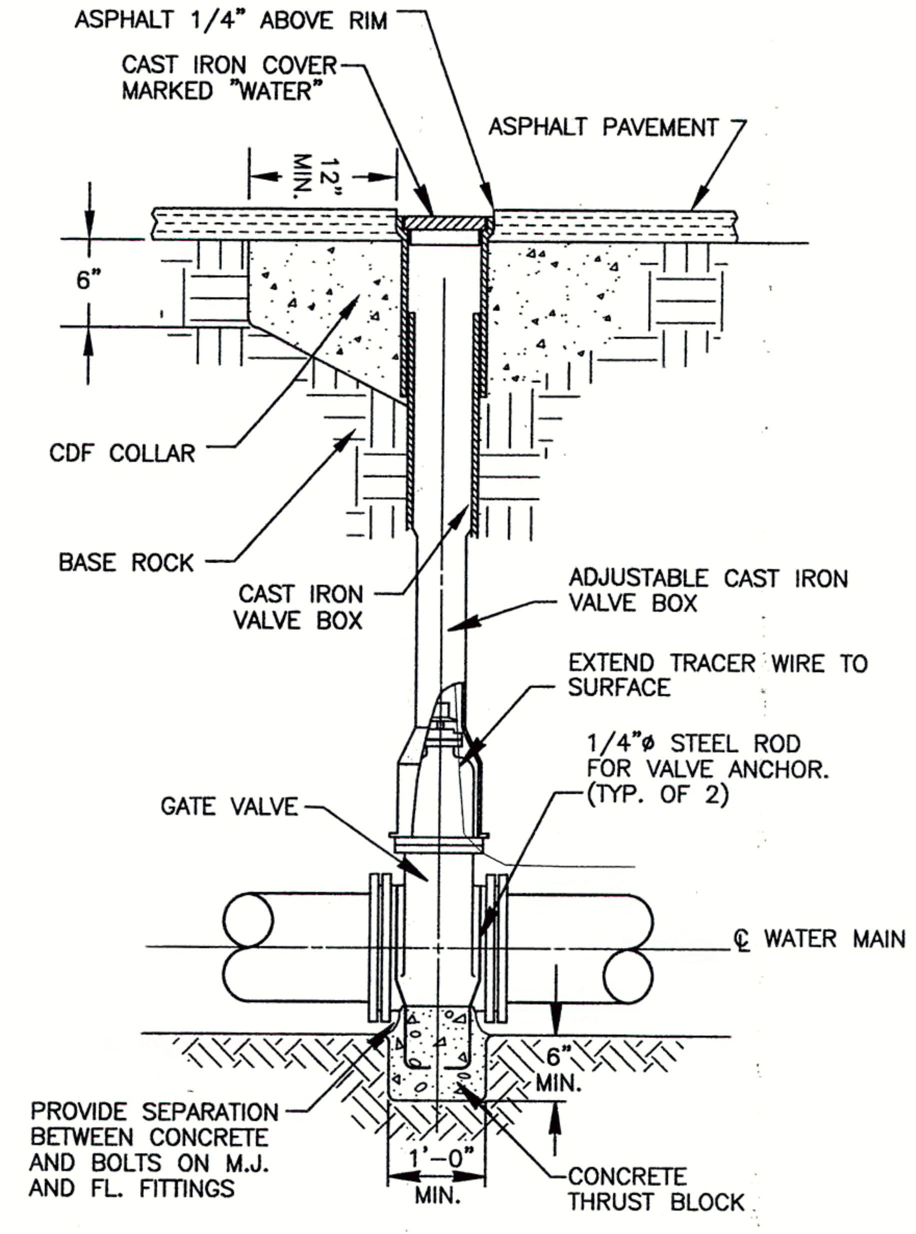
RECORD DRAWINGS

This record drawing reflects those changes made compared to the origianl construction documents, and represents the best of the DESIGN PROFESSIONAL'S knowledge, information and belief.

Date: 11/29/07
TOOTHMAN–ORTON ENGINEERING CO.

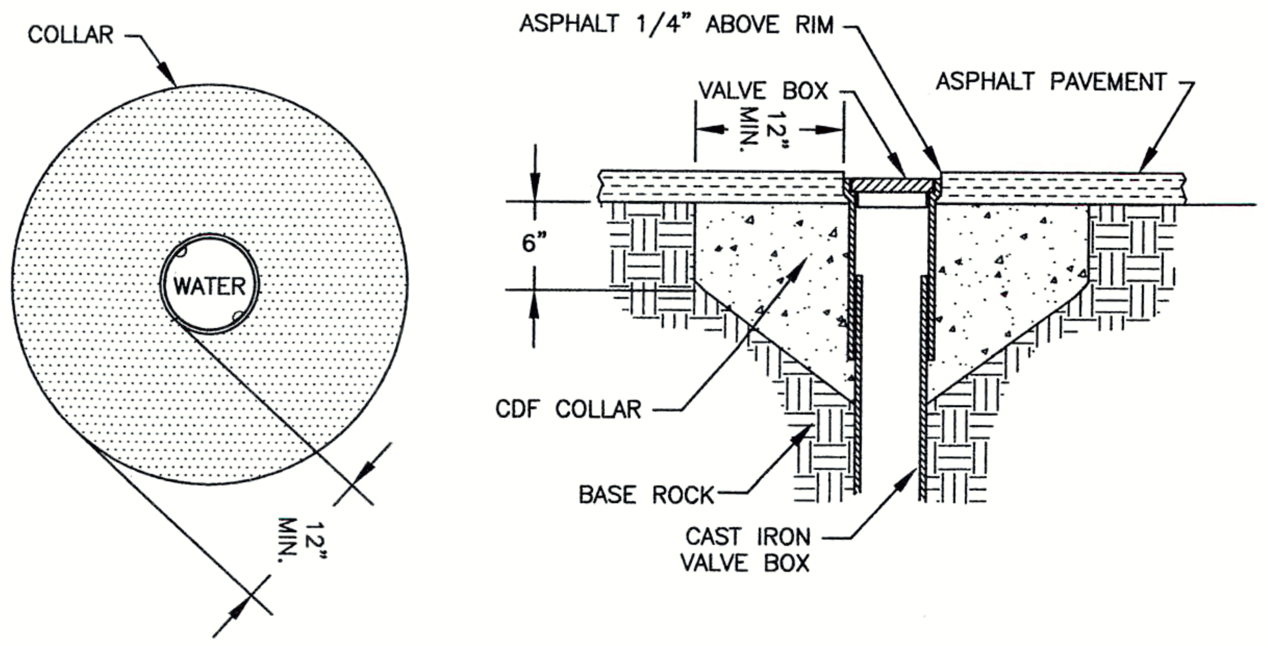


STANDARD BLOW–OFF DETAIL
SCALE: NONE



NOTE: TRACER WIRE SHALL BE BROUGHT UP OUTSIDE OF BOTTOM VALVE BOX AND INSIDE TOP SECTION OF VALVE BOX.

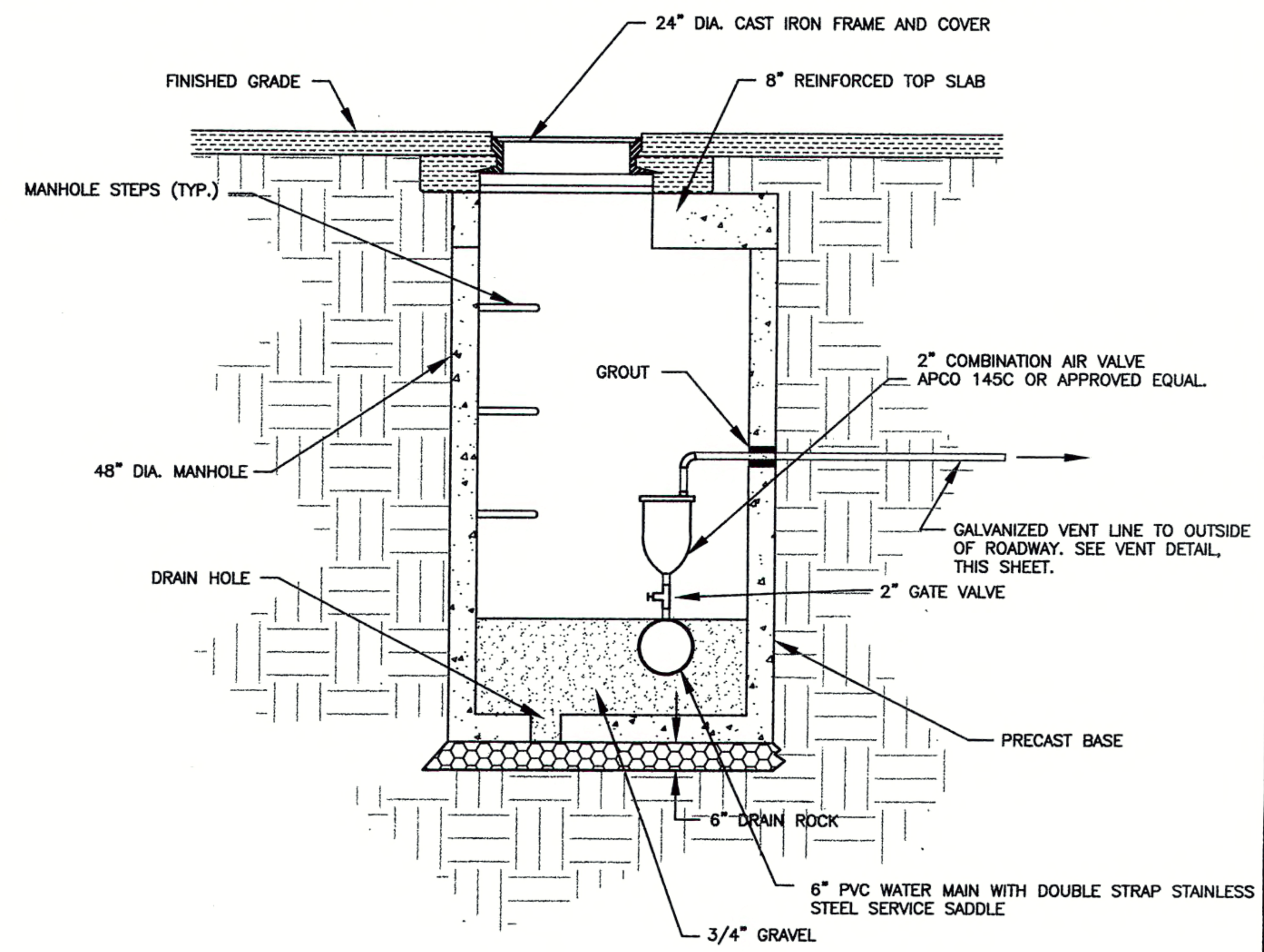
TYPICAL GATE VALVE INSTALLATION
SCALE: NONE



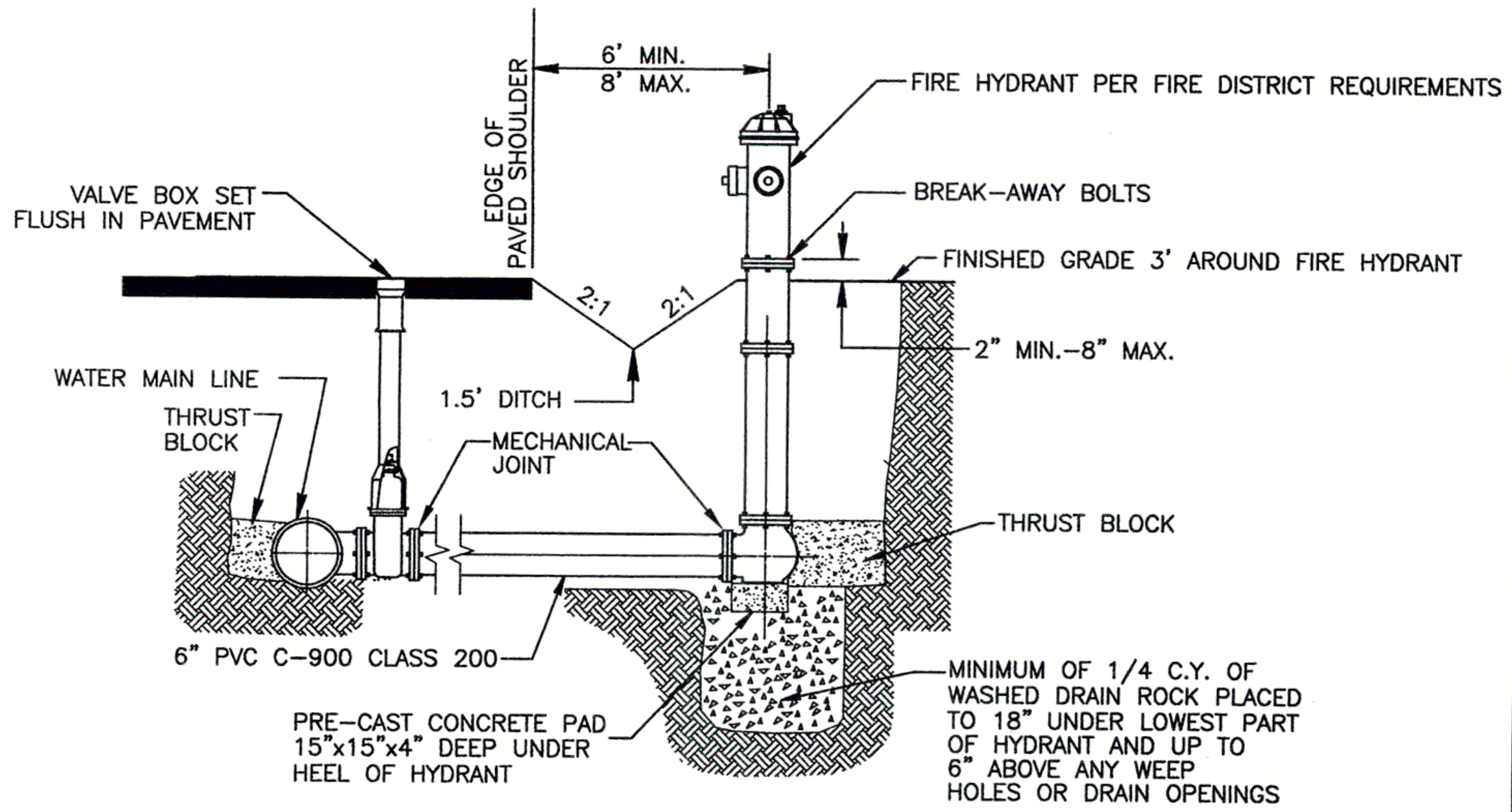
NOTES:
1. COLLARS SHALL BE INSTALLED AROUND ALL VALVE BOXES AND MANHOLES WITHIN ROADWAYS. COLLARS SHALL BE CONSTRUCTED UTILIZING CDF.
2. COLLAR REQUIRES AN INSPECTION DURING INSTALLATION.

THICKENED COLLAR DETAIL
SCALE: NONE

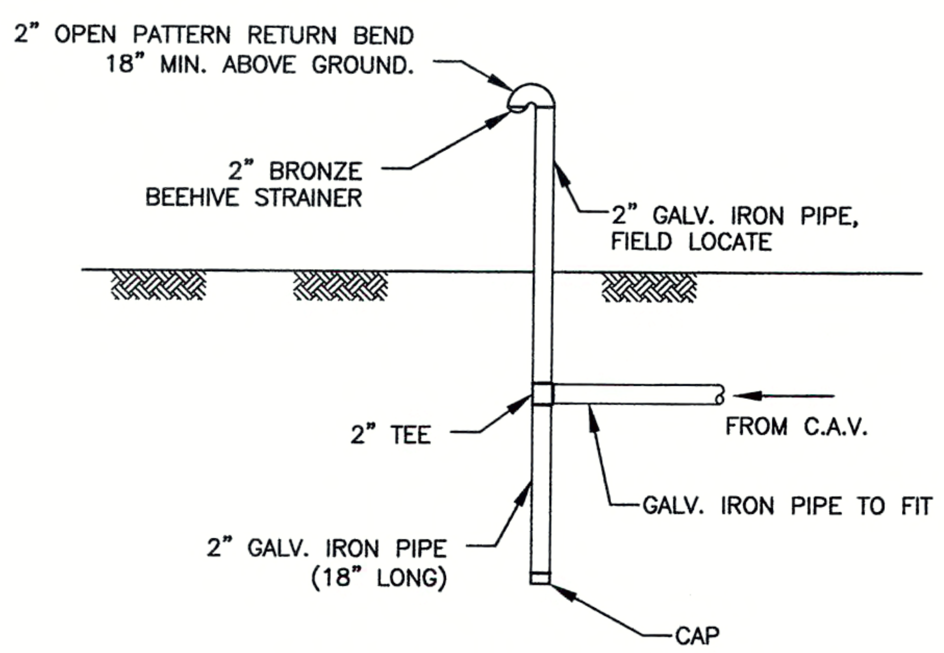
NOTES:
1. COMBINATION AIR VALVE ASSEMBLY MUST BE INSTALLED AT HIGHEST POINT OF LINE. IF HIGHEST POINT FALLS IN A LOCATION WHERE ASSEMBLY CANNOT BE INSTALLED PROVIDE ADDITIONAL DEPTH OF LINE TO CREATE HIGHT POINT AT A LOCATION WHERE ASSEMBLY CAN BE INSTALLED.



COMBINATION AIR VALVE ASSEMBLY
SCALE: NONE



FIRE HYDRANT DETAIL
SCALE: NONE



C.A.V. VENT DETAIL
SCALE: NONE

TOOTHMAN–ORTON ENGINEERING COMPANY

CONSULTING ENGINEERS, SURVEYORS AND PLANNERS

W. 280 PRAIRIE AVENUE
COEUR D'ALENE, ID 83815
(208) 762-3644
FAX (208) 762-3708

OFFICES IN:
BOISE, IDAHO
CALDWELL, IDAHO

PROFESSIONAL ENGINEER REGISTERED 8835 11/29/07 STATE OF IDAHO SCOTT G. MCNEE

E–FILE NAME	DET-SHEET.DWG
DESIGNED	GES
DRAWN	GES
CHECKED	SM
APPROVED	SM

REVISIONS

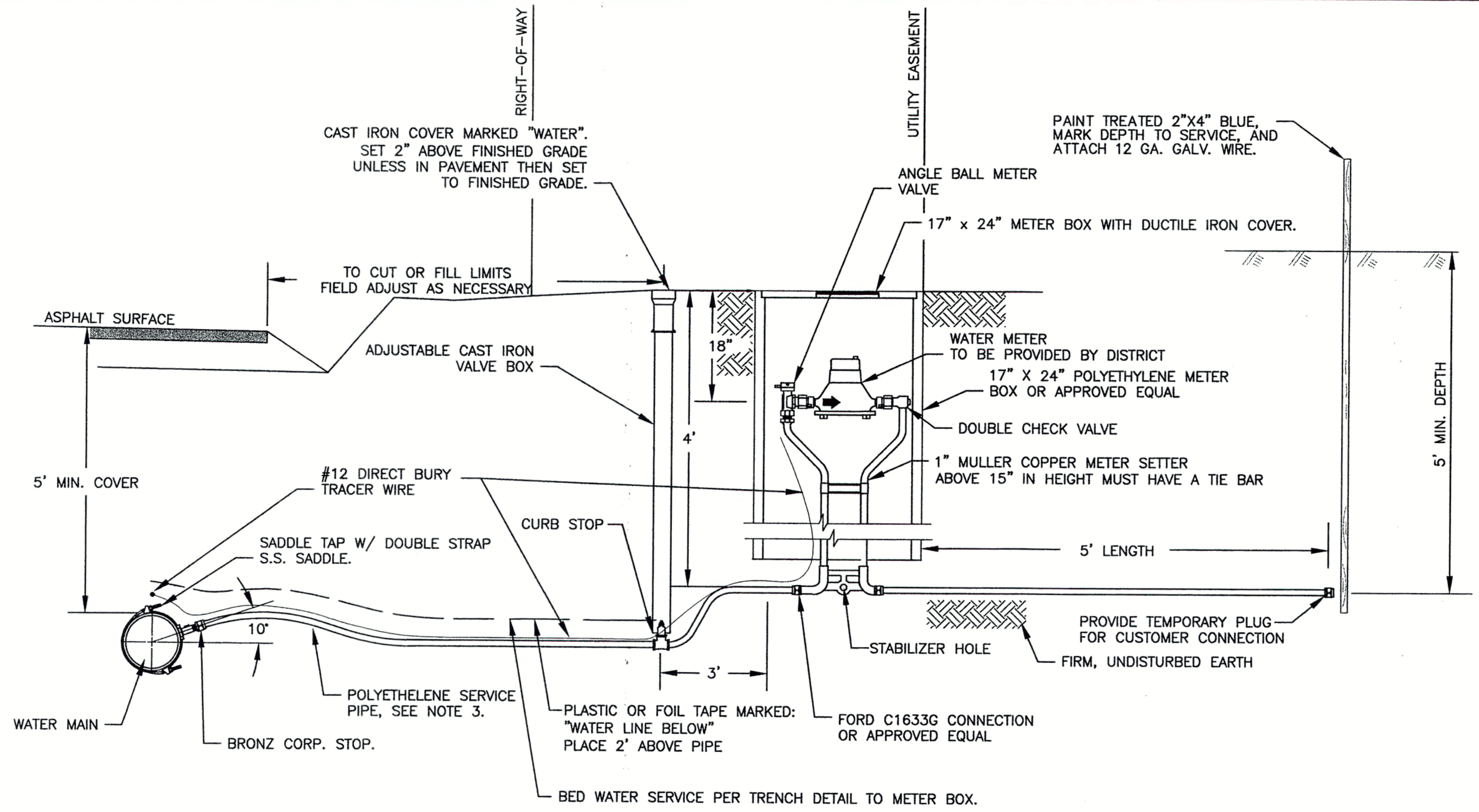
NO.	DATE	ITEM
1	3/8/07	AGENCY COMMENT
1	11/29/07	RECORD DRAWINGS

ES ENGINEERING
11917 HIDDEN VALLEY ROAD
RATHDRUM, ID 83858
PH./FAX (208) 687-7002

BAYWATCH ESTATES
BAYVIEW, IDAHO
WATER AND SEWER DETAILS

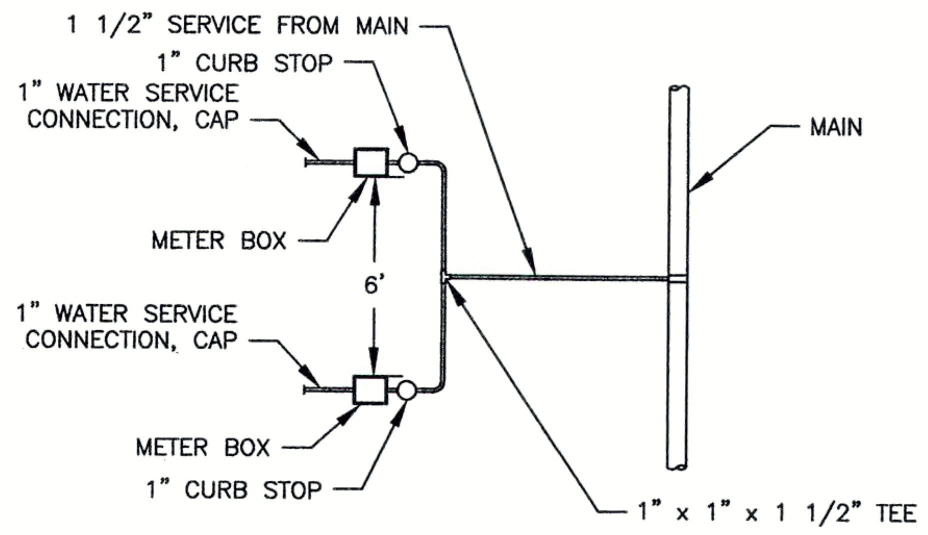
DATE: MARCH 2007
PROJECT: 0348

SHEET WS3 OF 6



TYPICAL WATER SERVICE DETAIL

SCALE: NONE

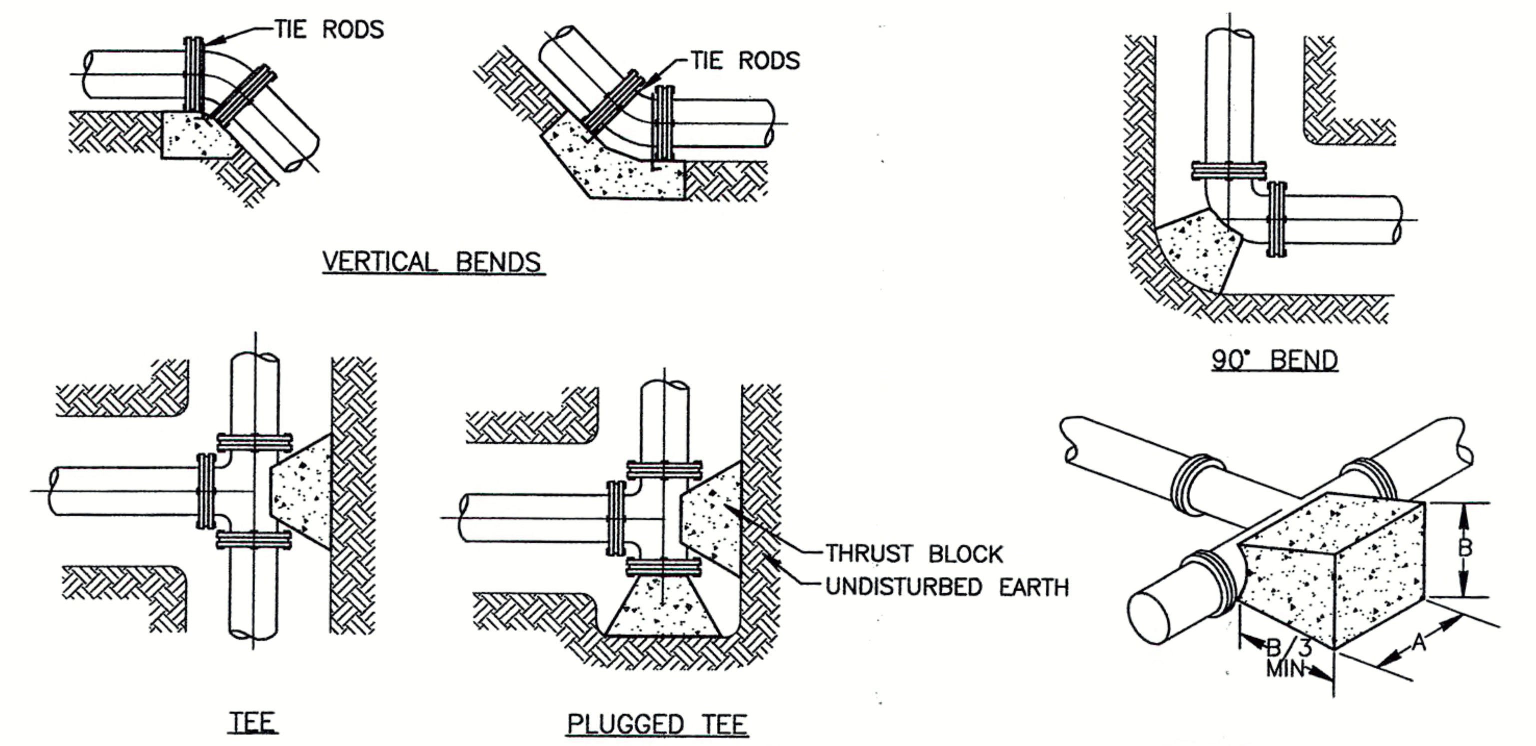


PLAN VIEW DOUBLE WATER SERVICE

SCALE: NONE

NOTES:

1. ALL WATER SERVICE COMPONENTS SHALL BE IRON PIPE SIZE. NO GALVANIZED PIPE OR FITTINGS SHALL BE USED. ALL COMPONENTS SHALL CONFORM TO NSF 61 STANDARDS. WATER SERVICE SADDLE, CORPORATION STOP, AND PIPE SHALL BE SIZED AS FOLLOWS:
   A. SINGLE SERVICE: 1 INCH
   B DOUBLE SERVICE 1–1/2 INCH
2. SERVICE PIPE SHALL BE POLYETHYLENE PRESSURE PIPE CONFORMING TO AWWA C–901. SERVICE PIPE SHALL BE CLASS 200, SDR 7.
3. SERVICE CONNECTIONS SHALL BE 12 INCHES MINIMUM FROM THE WATER MAIN PIPE END. MULTIPLE SERVICE CONNECTIONS IN THE SAME SECTION OF PIPE SHALL BE SEPARATED BY 12 INCHES MINIMUM.
4. SERVICE PIPE SHALL BE FLUSHED IMMEDIATELY PRIOR TO METER INSTALLATION.
5. WATER METERS SHALL BE 1 INCH BRONZE METER, US GALLON (BADGER MODEL SP–BM70ENVIRO). WATER METERS SHALL BE SUPPLIED AND INSTALLED BY THE WATER DISTRICT. METER BOX AND OTHER COMPONENTS ARE TO BE SUPPLIED AND INSTALLED BY THE DEVELOPER.
6. METER BOXES LOCATED WITHIN DRIVEWAYS SHALL BE TRAFFIC RATED FOR H–20 WHEEL LOADING.
7. BACKFLOW PREVENTION ASSEMBLIES ARE REQUIRED AT ALL BUILDINGS MORE THAN 30 FOOT IN ELEVATION ABOVE WATER MAIN.



DIMENSIONS FOR THRUST BLOCKING								
FITTING SIZES	TEES & PLUGS		90° BEND		45° BEND & WYES		REDUCERS, 22–1/2° AND SMALLER BEND	
	A	B	A	B	A	B	A	B
3"	1'–5"	1'–0"	1'–7"	1'–2"	1'–0"	1'–0"	1'–0"	0'–8"
4"	1'–8"	1'–3"	1'–10"	1'–7"	1'–9"	0'–11"	1'–7"	0'–7"
6"	2'–0"	1'–11"	2'–6"	2'–3"	1'–11"	1'–8"	1'–10"	1'–2"
8"	2'–9"	2'–7"	3'–2"	3'–0"	2'–5"	2'–1"	1'–10"	1'–7"
10"	3'–4"	3'–3"	4'–0"	3'–10"	3'–0"	2'–9"	2'–2"	1'–11"
12"	4'–0"	3'–10"	4'–8"	4'–8"	3'–8"	3'–3"	2'–7"	2'–3"

NOTES:

1. THE BEARING AREAS LISTED IN THE ABOVE TABLE ARE BASED ON 200– PSI MAIN PRESSURE AND 2000 P.S.F. SOIL BEARING PRESSURE. SOILS SUCH AS SILTS AND SOFT CLAYS HAVE LOWER SAFE BEARING CAPACITIES AND WILL REQUIRE LARGER THRUST BLOCKING. THE CONTRACTOR SHALL CONSULT WITH THE ENGINEER PRIOR TO PLACING THRUST BLOCKS IN QUESTIONABLE SOILS.
2. CONCRETE THRUST BLOCKS SHALL BE 3000 PSI CONCRETE PLACED AGAINST UNDISTURBED EARTH.
3. ALL CONCRETE SHALL BE PLACED SO THAT PIPE, FITTINGS, JOINTS AND BOLTS WILL BE ACCESSIBLE FOR REPAIRS. ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE BEFORE PLACING CONCRETE.

STANDARD THRUST BLOCK DETAILS

SCALE: NONE

RECORD DRAWINGS

This record drawing reflects those changes made compared to the original construction documents, and represents the best of the DESIGN PROFESSIONAL'S knowledge, information and belief.

Date: 11/29/07

TOOTHMAN–ORTON ENGINEERING CO.

TOOTHMAN–ORTON ENGINEERING COMPANY

CONSULTING ENGINEERS, SURVEYORS AND PLANNERS

W. 280 PRAIRIE AVENUE
COEUR D'ALENE, ID 83815
(208) 762–3644
FAX (208) 762–3708

OFFICES IN:
BOISE, IDAHO
CALDWELL, IDAHO

PROFESSIONAL ENGINEER REGISTERED 8835 11/21/07 STATE OF IDAHO SCOTT G. McNEE

E–FILE NAME	DET–SHEET.DWG
DESIGNED	GES
DRAWN	GES
CHECKED	SM
APPROVED	SM

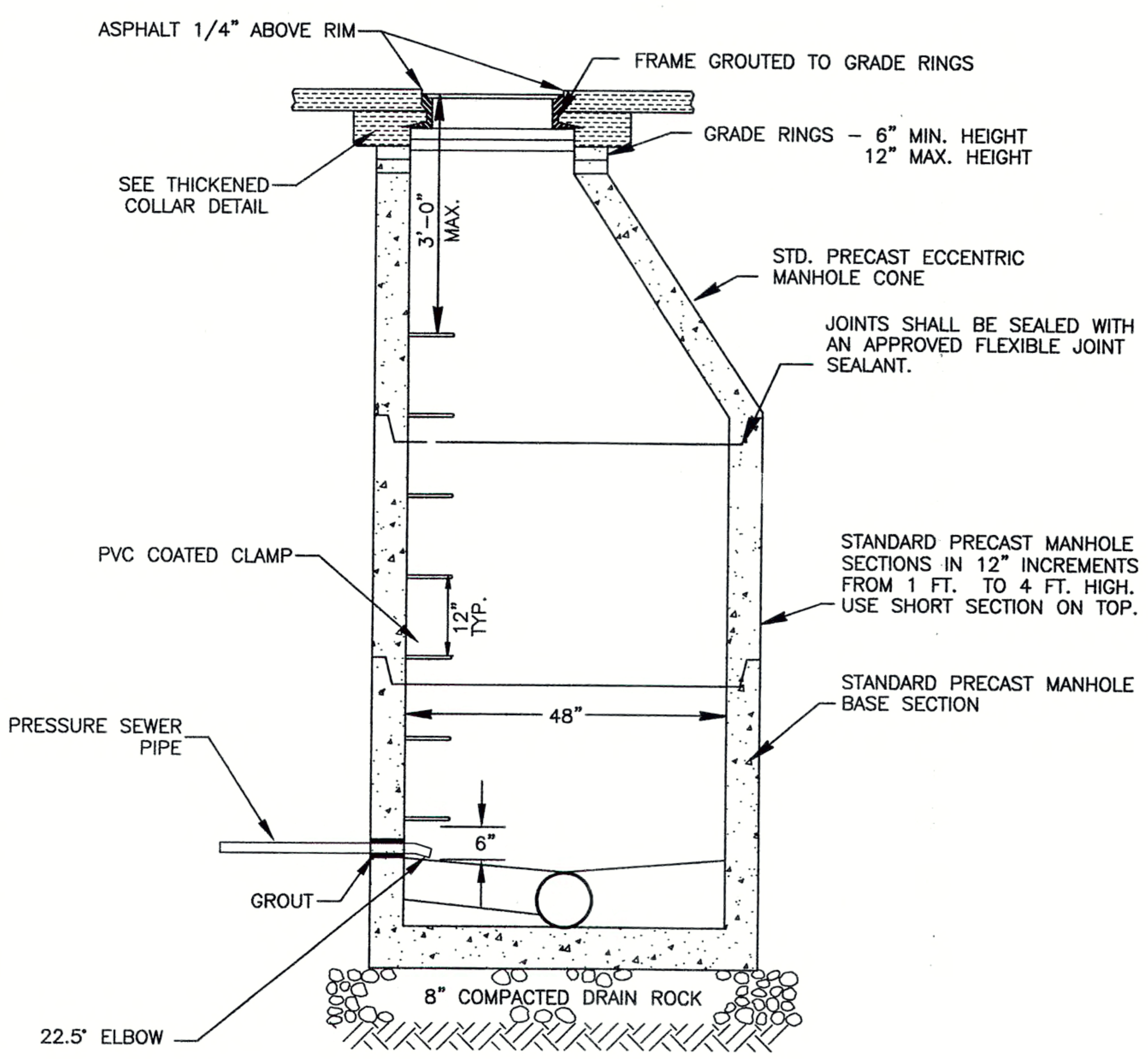
REVISIONS		
NO.	ITEM	DATE
1	AGENCY COMMENT	3/8/07
1	RECORD DRAWINGS	11/29/07

ES ENGINEERING
11917 HIDDEN VALLEY ROAD
RATHDRUM, ID 83858
PH./FAX (208) 687–7002

BAYWATCH ESTATES
BAYVIEW, IDAHO
WATER AND SEWER DETAILS

DATE: MARCH 2007
PROJECT: 0348

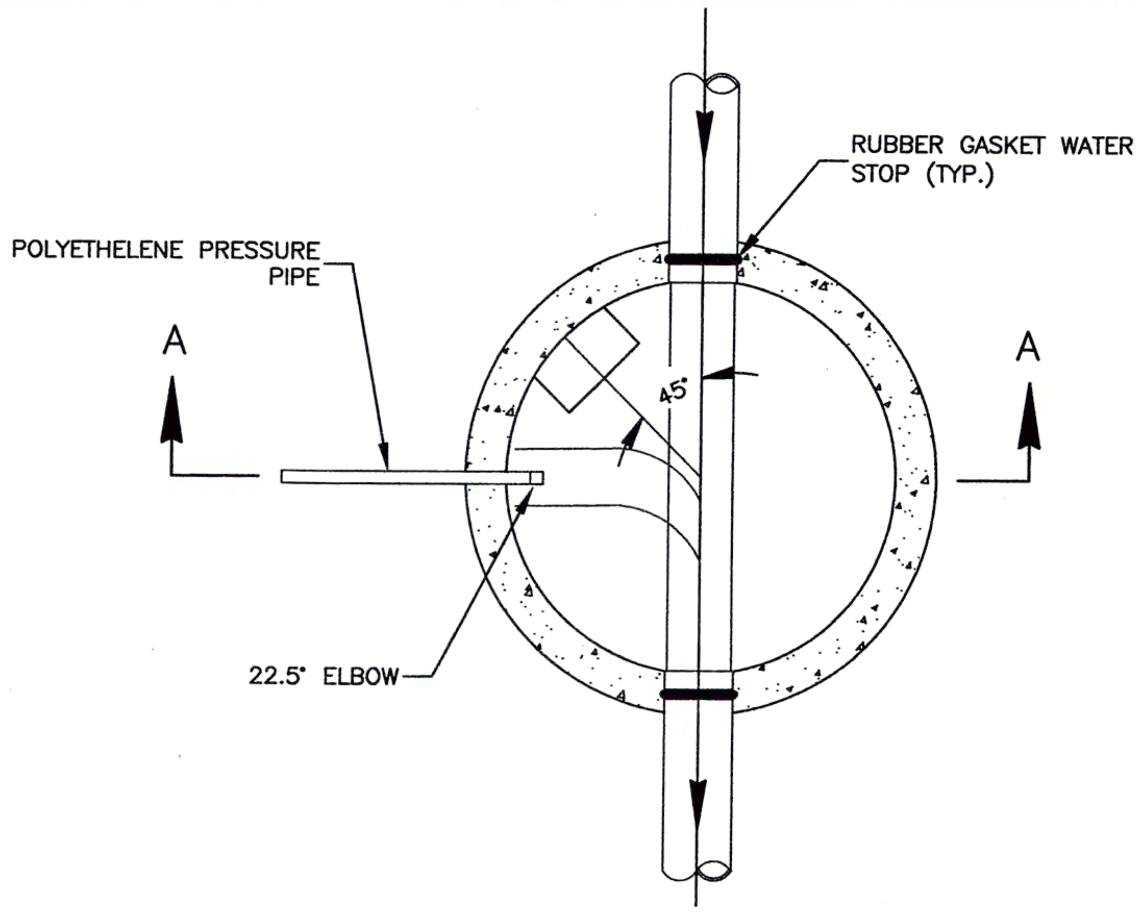
SHEET WS4 OF 6



SECTION A–A

STANDARD MANHOLE

SCALE: NONE



PLAN

MANHOLE NOTES

1. VERTICAL WALL SHALL BE PLACED ON UPSTREAM SIDE OF MANHOLE, ROTATED 45°.
2. WHERE THE MANHOLE INVERT IS 4 FEET OR MORE BELOW THE FINISHED GRADE ELEVATION STANDARD MANHOLE STEPS SHALL BE INSTALLED AS SHOWN. STEPS SHALL BE VERTICALY ALIGNED WITHIN ± 1" BETWEEN SECTIONS.
3. PRECAST MANHOLE BASES MAY BE USED. PIPE CONNECTIONS SHALL BE A.C. OR PVC SLEEVES CAST INTO THE BASE.
4. ALL MANHOLE SECTIONS SHALL CONFORM TO A.S.T.M C–478.
5. MANHOLE STEPS SHALL CONFORM TO IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION STANDARD DRAWING NO. SD–509.
6. MANHOLE COVER AND FRAME SHALL CONFORM TO IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION STANDARD DRAWING NO. SD–507. LID COVER SHALL MEET THE BAYVIEW WATER AND SEWER DISTRICT REQUIREMENTS FOR DESIGN.
7. GROUT FINISH ALL INTERIOR AND EXTERIOR JOINTS AND IMPERFECTIONS.
8. HYDROSTATIC TEST ALL MANHOLES IN ACCORDANCE WITH I.S.P.W.C. SECTION 502.
9. THICKENED COLLARS SHALL BE INSPECTED DURING INSTALLATION AND SHALL BE CONSTRUCTED WITH CONTROL DENSITY FILL. SEE THICKENED COLLAR DETAIL, SHEET WS3.

SDR–26 PVC WATER PIPE FOR GRAVITY SEWER (20' LENGTHS)

SIZE (IN.)	OUTSIDE DIAMETER (IN.)	MAX. BENDING RADIUS (FT.)	MAX. DEFLECTION (FT.) FOR 20' LENGTHS
4"	4.500	113	1.8
6"	6.625	116	1.2
8"	8.625	216	0.9

SDR–21 PVC WATER PIPE FOR PRESSURE SEWER (20' LENGTHS)

SIZE (IN.)	OUTSIDE DIAMETER (IN.)	MAX. BENDING RADIUS (FT.)	MAX. DEFLECTION (FT.) FOR 20' LENGTHS
2"	2.375	59	3.5
3"	3.500	88	2.3

C900 PVC WATER PIPE (20' LENGTHS)

SIZE (IN.)	OUTSIDE DIAMETER (IN.)	MAX. BENDING RADIUS (FT.)	MAX. DEFLECTION (FT.) FOR 20' LENGTHS
6"	6.900	173	1.2
8"	9.050	226	0.9

SDR–21 PVC WATER PIPE (20' LENGTHS)

SIZE (IN.)	OUTSIDE DIAMETER (IN.)	MAX. BENDING RADIUS (FT.)	MAX. DEFLECTION (FT.) FOR 20' LENGTHS
2"	2.375	59	3.5
3"	3.500	88	2.3

NOTE: AVOID AXIAL DEFELCTION AT PIPE JOINTS. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR LONGITUDIAL BENDING.

BENDING RADIUS OF PVC PIPE

WATER AND SEWER NOTES:

1. ALL WORK SHALL CONFORM TO THE MOST CURRENT EDITION OF THE IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION (ISPWC), AND AS AMENDED, SUPPLEMENTED, OR MODIFIED HEREIN.
2. EXISTING UTILITIES AND UNDERGROUND PIPING ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. NO GUARANTEE IS MADE OR IMPLIED THAT ALL EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION AND LOCATION OF ALL UTILITIES AND UNDERGROUND PIPING. THE CONTRACTOR SHALL CONTACT KOOTENAI COUNTY ONE CALL (1–800–428–4950) AT LEAST 48 HOURS PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES AND STRUCTURES.
3. A MINIMUM HORIZONTAL CLEARANCE OF 10' (OUTSIDE TO OUTSIDE OF PIPE) SHALL BE MAINTAINED BETWEEN WATER AND SEWER MAINS RUNNING PARALLEL.
4. FOR ALL GRAVITY SEWER AND WATER MAIN CROSSINGS WHERE LESS THAN 18" OF SEPARATION EXISTS, GRAVITY SEWER MAINS SHALL BE CONSTRUCTED OF PIPE CONFORMING TO WATER MAIN STANDARDS AND BOTH WATER AND SEWER MAINS SHALL HAVE FULL, UNCUT LENGTHS OF PIPE CENTERED AT CROSSING. UNDER NO CIRCUMSTANCES SHALL SEWAGE FORCE MAINS HAVE LESS THAT 18" OF SEPARATION AT WATER MAIN CROSSINGS.
5. GRAVITY SEWER MAIN PIPE SHALL BE SDR–26 PVC WATER PIPE. SEWER FORCE MAIN PIPE SMALLER THAN 4" SHALL BE SDR–21 PR200 PVC WATER PIPE. ALL SEWER LINES ARE EFFLUENT ONLY LINES.
6. PVC PIPE DEFLECTION SHALL NOT EXCEED THE MAXIMUM ALLOWABLE PIPE JOINT DEFLECTION OR MINIMUM BENDING RADIUS PER TABLE, SHEET WS5 AND PER PIPE MANUFACTURER'S RECOMMENDATIONS.
7. ALL GRAVITY SEWER LINES SHALL BE AIR PRESSURE TESTED IN ACCORDANCE WITH ISPWC SECTION 501. SEWER FORCE MAINS SHALL BE HYDROSTATICALLY PRESSURE TESTED IN ACCORDANCE WITH ISPWC SECTION 401.
8. ALL MANHOLES SHALL BE ADJUSTED TO FINAL GRADE BEFORE FINAL PAVING IS COMPLETE.
9. PRESSURE SEWER SHALL BE INSTALLED WITH A MINIMUM COVER OF FOUR FEET (INCLUDING DITCH BOTTOM). ALL PRESSURE SEWER SHALL BE PLACED IN TYPE 1 BEDDING IN ACCORDANCE WITH ISPWC. SEE TRENCH DETAIL, SHEET WS3.
10. THRUST BLOCKS SHALL BE INSTALLED AT ALL FITTINGS UNLESS OTHERWISE SPECIFIED ON THE PLANS. SEE STANDARD THRUST BLOCK DETAIL ON SHEET WS4.
11. ALL WATER LINES SHALL BE TESTED AND DISINFECTED IN ACCORDANCE WITH ISPWC DIVISION 400.
12. WATER LINES SHALL BE INSTALLED WITH A MINIMUM COVER OF FOUR FEET (INCLUDING DITCH BOTTOM). ALL WATER LINES SHALL BE PLACED IN TYPE I BEDDING IN ACCORDANCE WITH ISPWC. SEE TRENCH DETAIL, SHEET WS3.
13. THE CONTRACTOR SHALL INSTALL TRACER (#12 DIRECT BURIED) WIRE IN THE TRENCH TAPED TO THE TOP OF ALL WATER LINES. WIRE SHALL BE AVAILABLE AT ALL VALVE BOXES AND STUB–OUTS.
14. JOINT RESTRAINTS SHALL BE INSTALLED AT LOCATIONS WHERE PROPER THRUST BLOCKING AGAINST UNDISTURBED EARTH CANNOT BE ACHIEVED AND SHALL BE EBBA SERIES 2000 PV OR APPROVED EQUAL.

RECORD DRAWINGS

This record drawing reflects those changes made compared to the original construction documents, and represents the best of the DESIGN PROFESSIONAL'S knowledge, information and belief.

Date: 11/29/07

TOOTHMAN–ORTON ENGINEERING CO.

TOOTHMAN–ORTON ENGINEERING COMPANY

CONSULTING ENGINEERS, SURVEYORS AND PLANNERS

W. 280 PRAIRIE AVENUE
COEUR D'ALENE, ID 83815
(208) 762–3644
FAX (208) 762–3708

OFFICES IN:
BOISE, IDAHO
CALDWELL, IDAHO

PROFESSIONAL ENGINEER REGISTERED 8835 11/21/07 STATE OF IDAHO SCOTT G. MCKEE

E-FILE NAME	DET-SHEET.DWG
DESIGNED	GES
DRAWN	GES
CHECKED	SM
APPROVED	SM

REVISIONS

NO.	ITEM	DATE
1	RECORD DRAWINGS	11/29/07

ES ENGINEERING
11917 HIDDEN VALLEY ROAD
RATHDRUM, ID 83858
PH./FAX (208) 687-7002

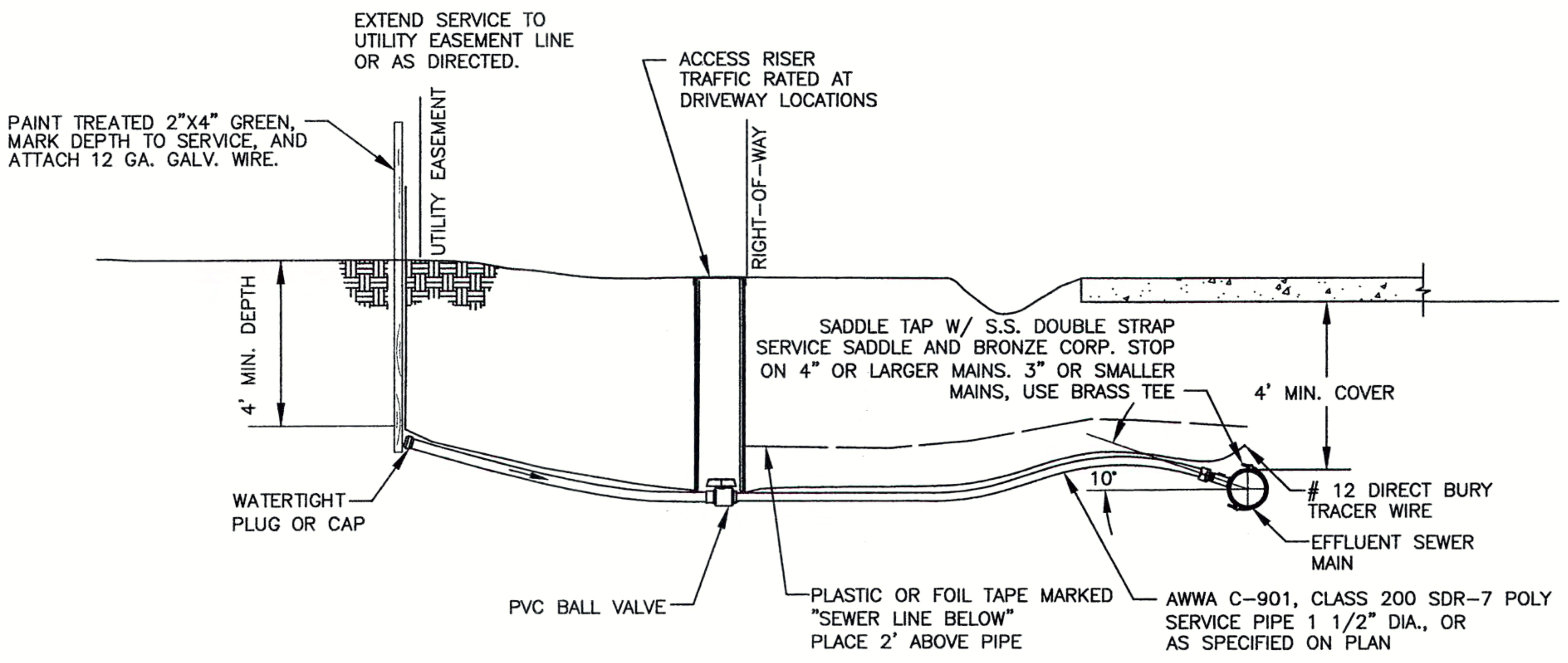
BAYWATCH ESTATES

BAYVIEW, IDAHO

WATER AND SEWER DETAILS

DATE:	JANUARY 2007
PROJECT:	0348

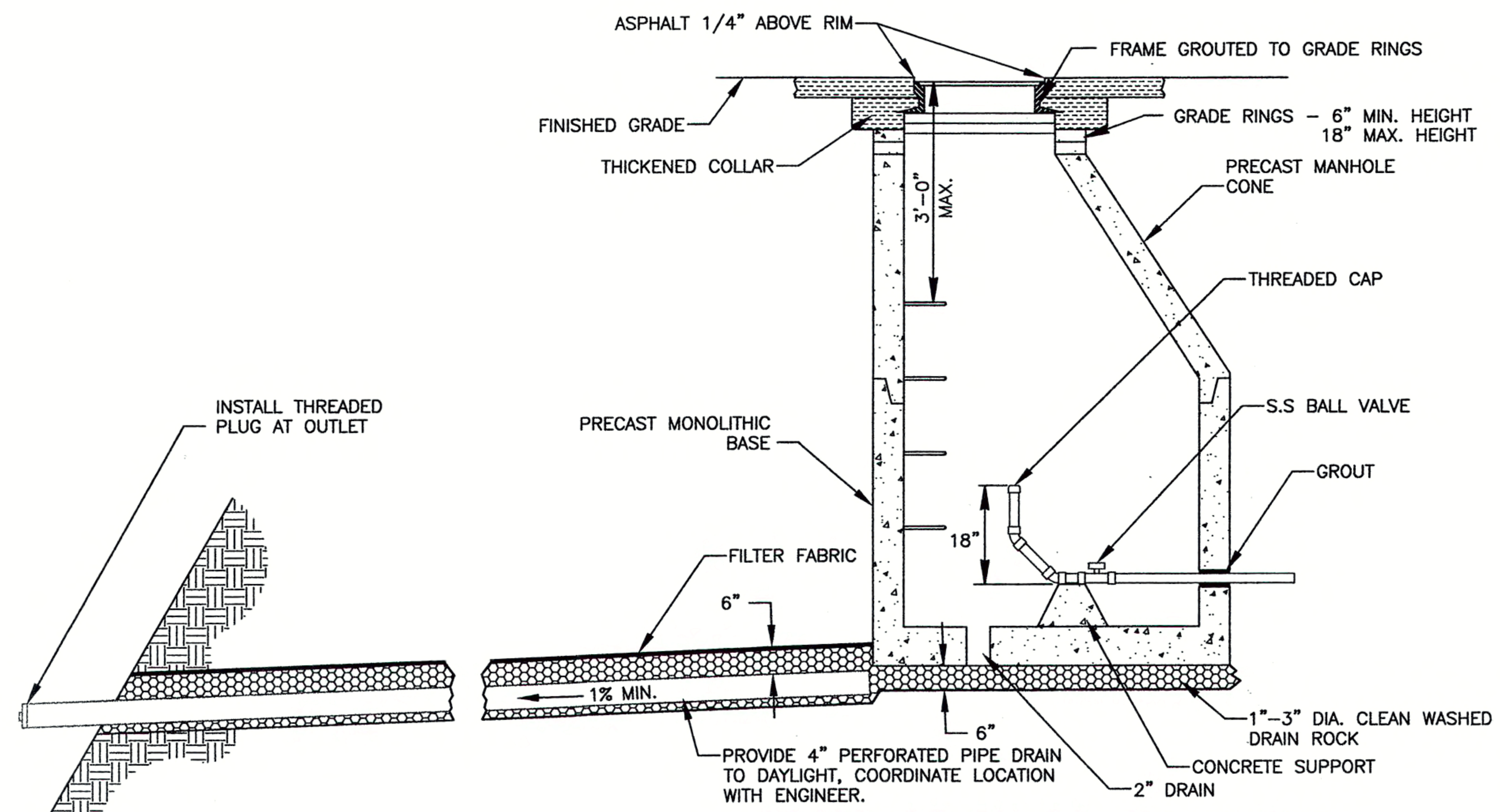
SHEET WS5 OF 6



*ALL SERVICE LINE CONNECTIONS SHALL BE THREADED COMPRESSION FITTINGS. ALL SERVICE LATERALS FROM THE EFFLUENT SEWER MAIN TO THE PROPERTY LINE SHALL BE PRESSURE TESTED PRIOR TO ANY BACKFILLING.

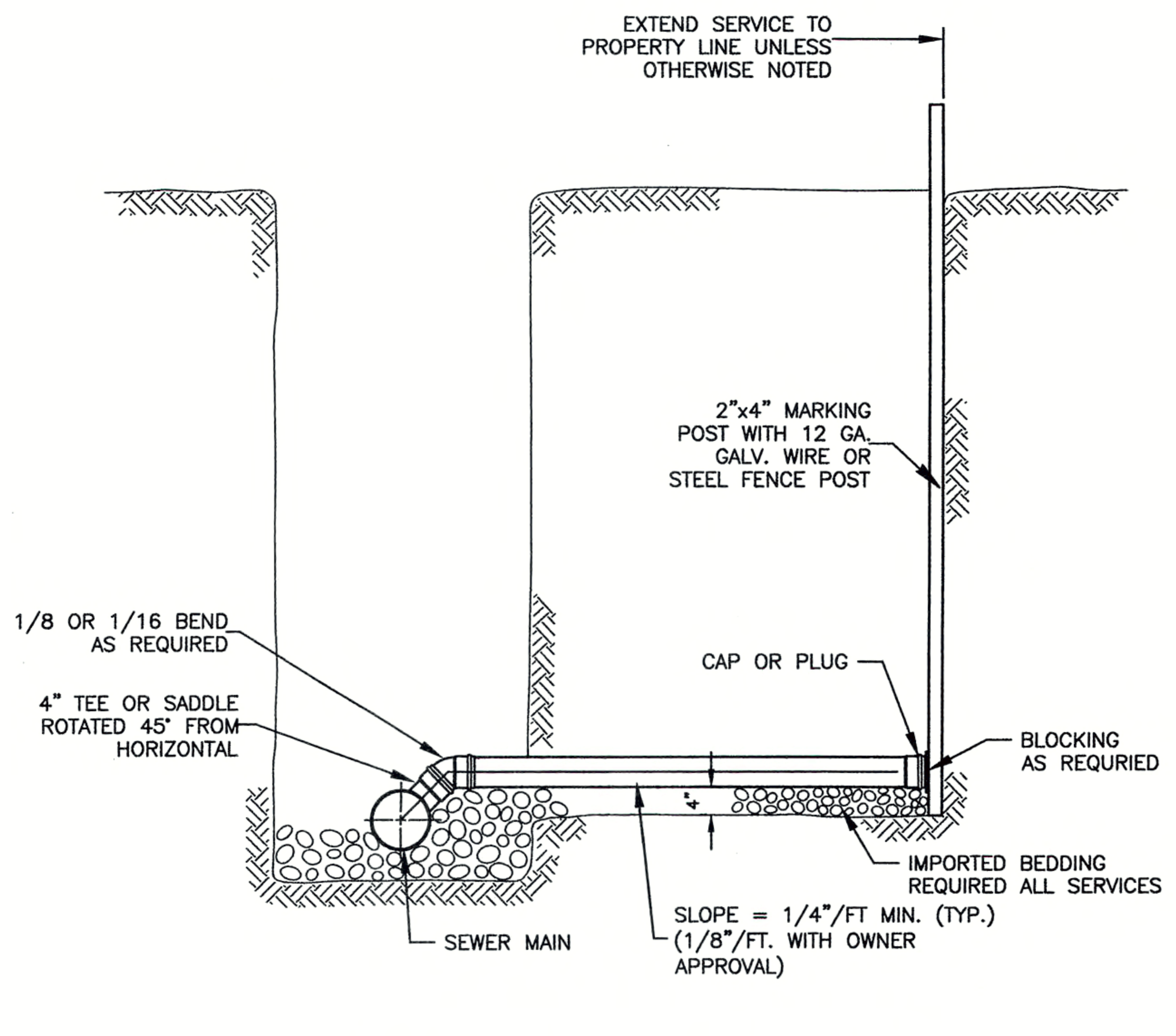
PRESSURE SERVICE CONNECTION TO PRESSURE OR GRAVITY SEWER

N.T.S.



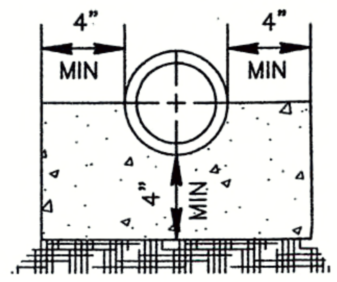
PRESSURE SEWER CLEAN-OUT

SCALE: NONE



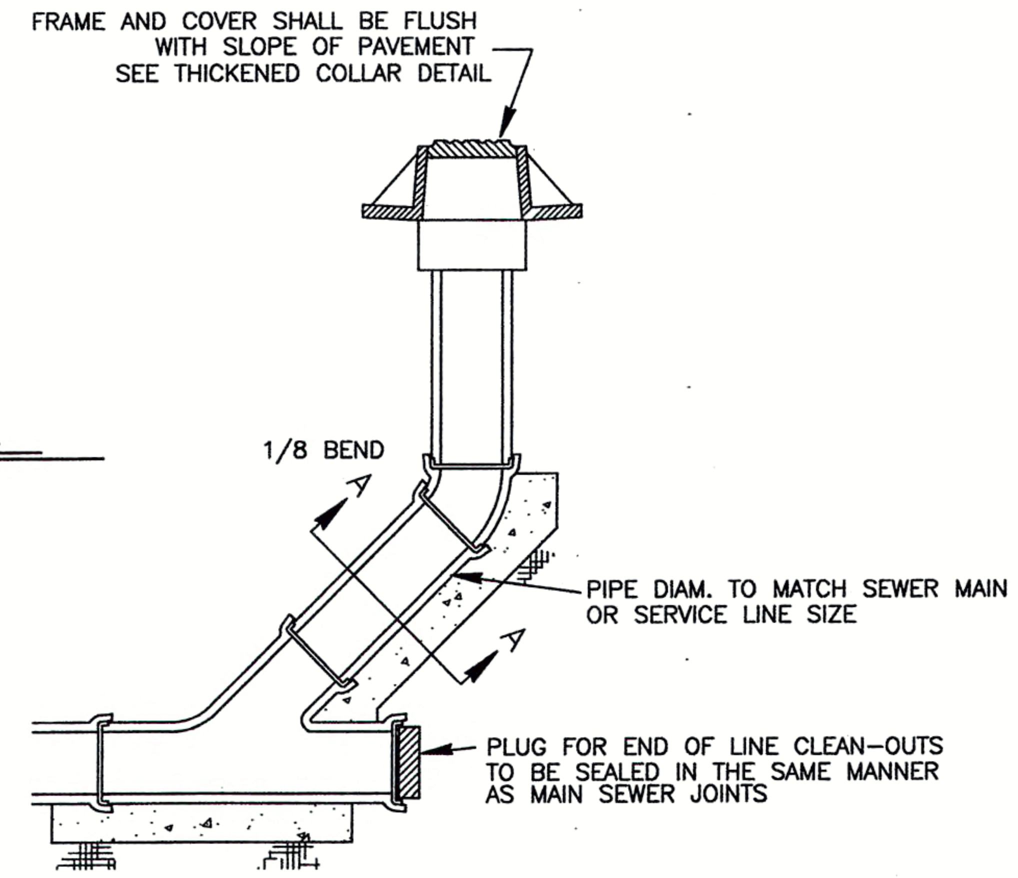
GRAVITY SERVICE CONNECTION (GS)

N.T.S.



SECTION A-A

SCALE: NONE



GRAVITY SEWER CLEAN-OUT

SCALE: NONE

RECORD DRAWINGS

This record drawing reflects those changes made compared to the origianl construction documents, and represents the best of the DESIGN PROFESSIONAL'S knowledge, information and belief.

Date: 11/29/07

TOOTHMAN-ORTON ENGINEERING CO.

TOOTHMAN-ORTON ENGINEERING COMPANY

CONSULTING ENGINEERS, SURVEYORS AND PLANNERS

W. 280 PRAIRIE AVENUE
COEUR D'ALENE, ID 83815
(208) 762-3644
FAX (208) 762-3708

OFFICES IN:
BOISE, IDAHO
CALDWELL, IDAHO

PROFESSIONAL ENGINEER REGISTERED 8835 11/29/07 STATE OF IDAHO SCOTT G. McNEE

E-FILE NAME	DET-SHEET.DWG
DESIGNED	GES
DRAWN	GES
CHECKED	SM
APPROVED	SM

REVISIONS		
NO.	ITEM	DATE
1	AGENCY COMMENT	3/8/07
1	RECORD DRAWINGS	11/29/07

ES ENGINEERING
11917 HIDDEN VALLEY ROAD
RATHDRUM, ID 83858
PH./FAX (208) 687-7002

BAYWATCH ESTATES
BAYVIEW, IDAHO
WATER AND SEWER DETAILS

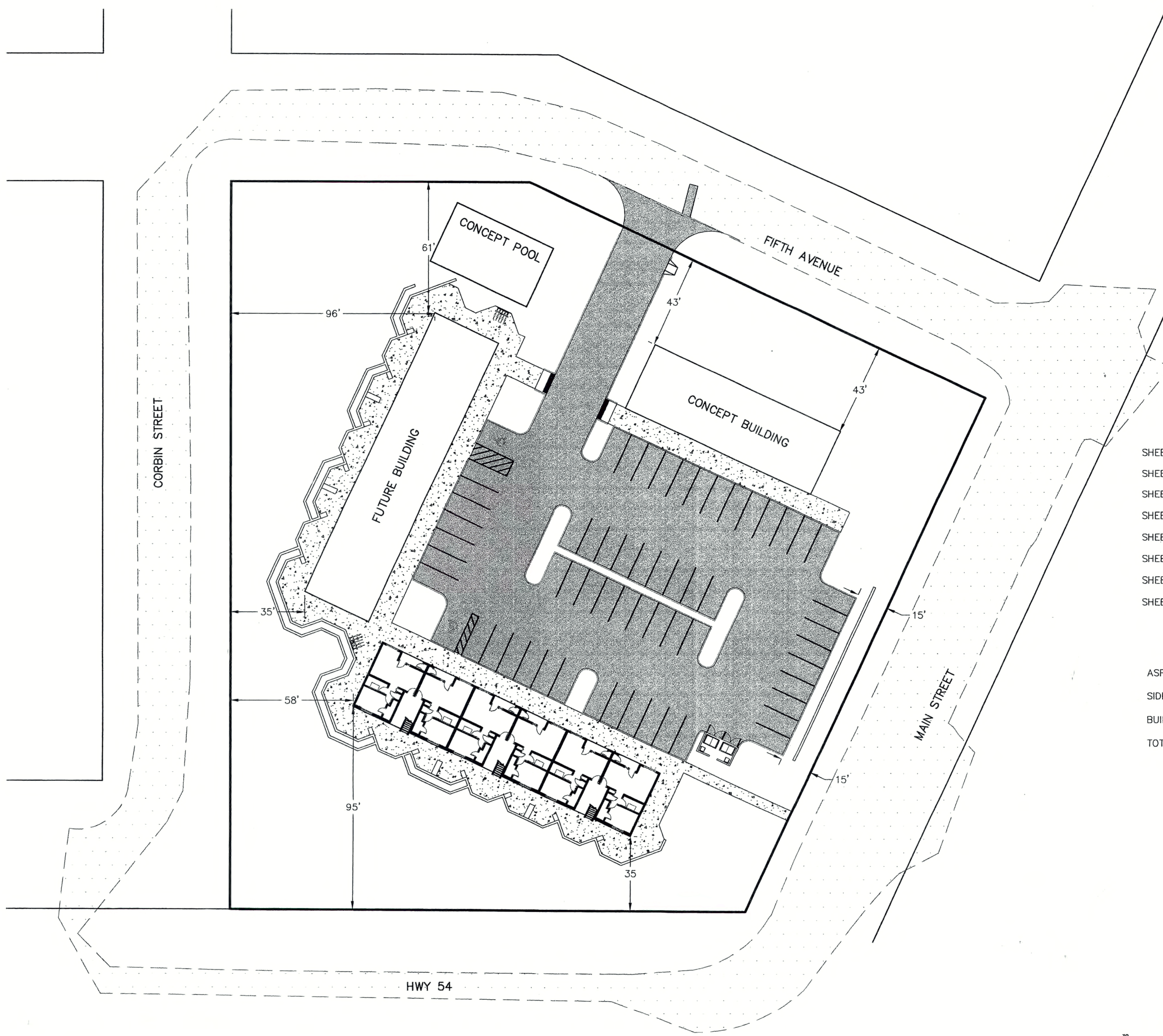
DATE:	MARCH 2007
PROJECT:	0348

SHEET WS6 OF 6

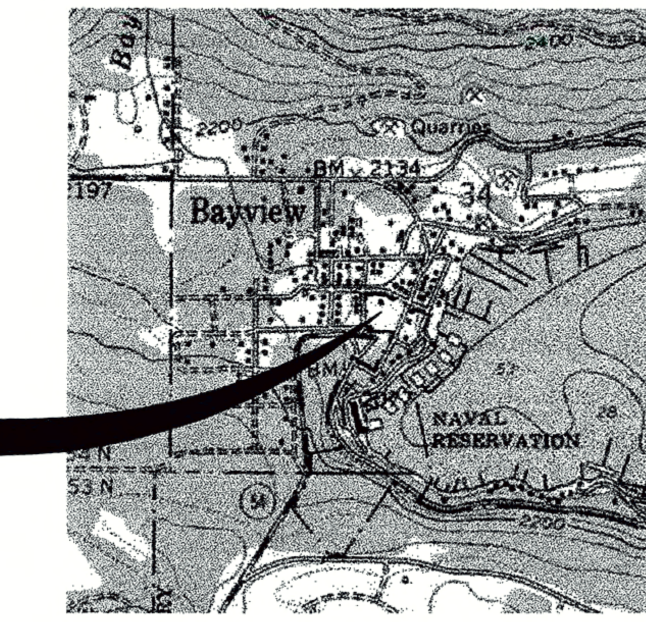
SITE IMPROVEMENTS

BAYVIEW LODGE

IN THE SOUTHWEST QUATER OF SECTION 34, TOWNSHIP 54 NORTH, RANGE 2 WEST,
B.M. CITY OF BAYVIEW, KOOTENAI COUNTY IDAHO.



PROJECT AREA



VICINITY MAP
N.T.S.

SHEET INDEX

IMPERVIOUS AREAS

ASPHALT/CURB AND GUTTER: 23,773 S.F.

SIDEWALK/PATIO: 13,946 S.F.

BUILDING/ROOF: 4,762 S.F.

TOTAL IMPERVIOUS: 42,481 S.F.

GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 inch = 30 ft.

LEGEND

EXISTING FEATURES

ASPHALT SURFACING
CURB
SIDEWALK
FOUND POINT AS NOTED
DRYWELL
GUY WIRE POLE
POWER POLE
TELEPHONE ENCLOSURE
WATER VALVE
FIRE HYDRANT
SANITARY SEWER MANHOLE
WATER LINE
SANITARY SEWER LINE
STORM DRAIN LINE / CULVERT
POWER LINE (OHP OR UGP)
TELEPHONE LINE (OHT OR UGT)
GAS LINE
CONTOURS
FENCE
FIBER OPTIC LINE
LOT LINE
SECTION LINE
1/4 SECTION LINE

PROPOSED IMPROVEMENTS

ASPHALT SURFACING
CURB
SIDEWALK
GRAVEL
DRYWELL
STORM MANHOLE
CONCRETE INLET
POWER POLE
WATER VALVE
FIRE HYDRANT
WATER SHUTOFF / WATER VAULT
SANITARY SEWER MANHOLE
CLEANOUT (CO)
WATER LINE (AS SIZED)
SINGLE WATER SERVICE
DOUBLE WATER SERVICE
SLEEVE FOR WATER / SEWER / WATER CROSSING
SANITARY SEWER LINE (AS SIZED)
SANITARY SEWER SERVICE
STORM DRAIN LINE / CULVERT
UTILITY TRENCHING
GAS LINE TRENCHING
CONTOURS
FENCE
STORM WATER SWALE / POND
DIRECTION OF SURFACE STORM WATER DRAINAGE
1924.50 / 1924.00 — TOP OF CURB ELEVATION / FLOWLINE ELEVATION
CURB INLET / 1924.00 — CURB INLET / INLET ELEVATION AT FLOWLINE
1924.00 — FINISHED GRADE ELEVATION

CALL BEFORE YOU DIG 428-4950

No.	DESC. / DATE	BY
4		
3		
2		
1		

SE

STORHAUG ENGINEERING

LAND SURVEYING — LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING — LAND USE PLANNING
510 EAST THIRD AVE. — SPOKANE, WA 99202
PHONE 509-242-1000 — FAX 509-242-1001

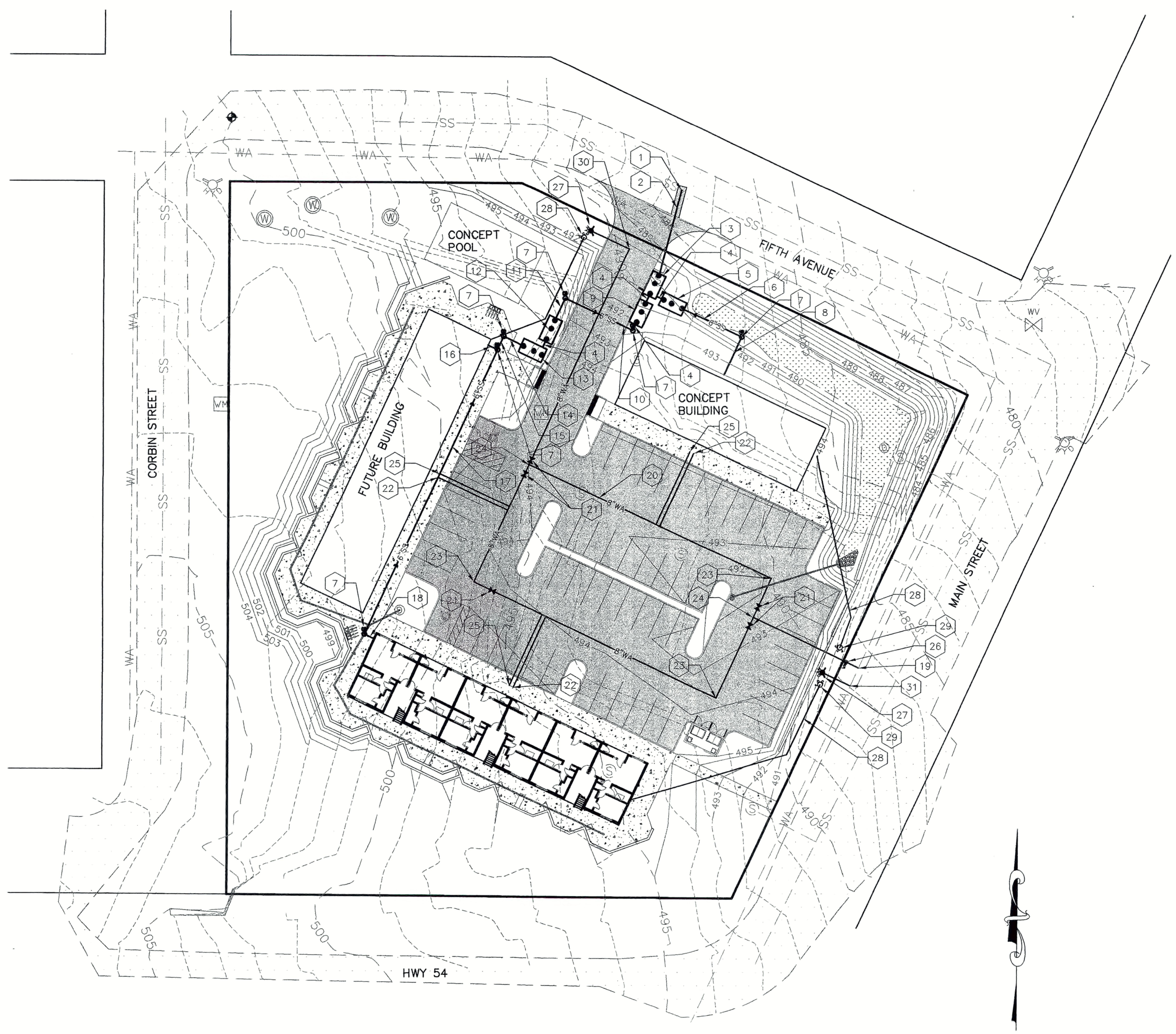
SHEET TITLE: COVER AND INDEX SHEET

PROJECT TITLE: BAYVIEW LODGE
BAYVIEW, ID

SEAL: PROFESSIONAL ENGINEER REGISTERED 12543 STATE OF IDAHO 5/14/08

DATE	05/14/08
DRAWN	DLT
CHECKED	CBM
PROJECT NUMBER	07-254
DRAWING NO.	1 OF 8
	COVER

07254-b.dwg COVER(1)



GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft.

BENCH MARK
TBM MAG NAIL. ELEV. = 500.00

NOTES

1. SEE BUILDING PLANS FOR ADDITIONAL INFORMATION.

2. SEE DETAIL SHEET FOR CONSTRUCTION NOTES AND SEEDING SPECIFICATIONS.

3. EXISTING AND PROPOSED CONTOURS SHOWN AT 1 FOOT INTERVALS.

4. THIS DRAWING IN NO WAY REPRESENTS A BOUNDARY SURVEY BY STORHAUG ENGINEERING. COORDINATE WITH OWNER REGARDING PROPERTY BOUNDARIES AND EASEMENTS.

5. EXISTING FLOW LINE ELEVATIONS SHOWN ALONG MAIN STREET ARE INTERPOLATED ELEVATIONS FROM A TOPOGRAPHIC SURVEY. CONTRACTOR SHALL FIELD VERIFY ELEVATIONS.

6. ADD 400' TO ALL SPOT ELEVATIONS, UNLESS OTHER WISE INDICATED.

7. MAINTAIN AT LEAST 1 FOOT OF COVER OVER STORM DRAIN AND SEWER PIPES.

8. REFER TO GRADING AND DRAINAGE PLAN FOR ADDITIONAL INFORMATION REGARDING STORM WATER MANAGEMENT IMPROVEMENTS.

9. REFER TO ISPWC SD-407 FOR WATER AND NON-POTABLE WATER LINE SEPARATION REQUIREMENTS.

10. THRUST BLOCKS SHALL BE PROVIDED FOR ALL PRESSURE PIPELINES IN ACCORDANCE WITH ISPWC STANDARDS, REFER TO ISPWC SD-403.

11. INFORMATION ON EXISTING UTILITY LINES SHOWN ON THESE PLANS WAS OBTAINED FROM UTILITY SERVICE RECORD DRAWINGS AND FOUND SURFACE FEATURES. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND REQUIRED ELEVATIONS AT THE SUBJECT SITE PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT / ENGINEER OF ANY EXCEPTIONS ENCOUNTERED DURING CONSTRUCTION.

12. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR ALL REQUIREMENTS AND TO CONFIRM THAT AN ADEQUATE DEPTH OF COVER IS MAINTAINED OVER THE UTILITIES.

13. UTILITY TRENCHING SHALL BE DONE IN ACCORDANCE WITH TRENCH DETAIL ON DETAIL SHEET.

14. WATER LINES AND APPURTENANCES SHALL MEET THE REQUIREMENTS OF THE BAYVIEW WATER DISTRICT AND THE GOVERNING FIRE DEPARTMENT. WATER LINES SHALL BE INSTALLED WITH MINIMUM COVER OF 60 INCHES FROM TOP OF PIPE. COORDINATE CONSTRUCTION SCHEDULING AND CONFIRM ALL REQUIREMENTS WITH THE BAYVIEW SEWER AND WATER DISTRICT.

15. THE ELECTRICITY, TELEPHONE, NATURAL GAS AND/OR OTHER UTILTIES WILL BE ASCERTAINED FROM THE OTHER UTILITY COMPANIES.

16. WATER / SEWER LINE CROSSING REQUIREMENTS:

A- FOR ALL NEW CONSTRUCTION, WHEN A WATER LINE IS ABOVE A GRAVITY SEWER LINE AND THE CLEARANCE IS GREATER THAN OR EQUAL TO 18 INCHES, THERE SHALL BE NO ADDITIONAL REQUIREMENTS FOR CONSTRUCTION.

B- IF THE GRAVITY FLOW SEWER LINE IS ABOVE THE WATER LINE AND OR THE CLEARANCE IS LESS THAN 18 INCHES THEN SLEEVING IS REQUIRED.

C- THE SLEEVE PIPE SHALL BE 1 SIZE LARGER THAN THE CONSTRUCTION PIPE.

D- THE SLEEVE SHALL BE AT LEAST 20' IN LENGTH AND CENTERED ON THE CROSSING TO PROVIDE FOR A MINIMUM HORIZONTAL SEPARATION OF 10' EACH SIDE OF THE CROSSING, MEASURED PERPENDICULAR TO THE CROSSED LINE.

E- EACH END OF THE SLEEVE SHALL BE SEALED WITH A FERNCO RUBBER COUPLER.

17. POST INDICATOR VALVE AND FIRE SERVICE LINES TO BE DESIGN BUILD. COORDINATE WITH LOCAL FIRE AND WATER DEPARTMENTS FOR REQUIREMENTS.

UTILITY TABLE

1	CONNECT TO EXISTING 4" PVC SEWER PIPE WITH SADDLE TAP. CONTRACTOR SHALL FIELD VERIFY DEPTH PRIOR TO CONSTRUCTION. I.E. 481.85 (ESTIMATED FROM RECORD DRAWINGS)
2	4" PVC SDR-35 PIPE. L= 41.37' S= 7.76%
3	2500 GALLON, SINGLE COMPARTMENT SEPTIC TANK WITH TWO SIDE INLETS. WILBERT PRECAST PRODUCT 1617 OR EQUIVELENT. ADJUST RIM TO GRADE USING WILBERT PRECAST PVC RIBBED RISERS AND FIBERGLASS BOLT DOWN COVERS OR EQUIVELENT. RIM EL: 491.00 I.E. (IN)= 485.31 I.E. (OUT)= 485.06
4	4" PVC SDR-35 PIPE. L= 3.0' S= 2.00%
5	2500 GALLON, SINGLE COMPARTMENT SEPTIC TANK. WILBERT PRECAST PRODUCT 1617 OR EQUIVELENT. ADJUST RIM TO GRADE USING WILBERT PRECAST PVC RIBBED RISERS AND FIBERGLASS BOLT DOWN COVERS OR EQUIVELENT. RIM EL: 491.00 I.E. (IN)= 485.62 I.E. (OUT)= 485.37
6	6" PVC SDR-35 PIPE. L= 30.54' S= 15.59%
7	90° BEND WITH CLEANOUT. SEE DETAIL SHEET FOR SPECIFICATIONS.
8	6" PVC SDR-35 PIPE. L= 19.70' S= 2.00% I.E. (BLDG) 490.77
9	2500 GALLON, SINGLE COMPARTMENT SEPTIC TANK. WILBERT PRECAST PRODUCT 1617 OR EQUIVELENT. ADJUST RIM TO GRADE USING WILBERT PRECAST PVC RIBBED RISERS AND FIBERGLASS BOLT DOWN COVERS OR EQUIVELENT. RIM EL: 492.00 I.E. (IN)= 4835.92 I.E. (OUT)= 485.37
10	6" PVC SDR-35 PIPE. L= 35.98' S= 2.00%
11	6" PVC SDR-35 PIPE. L= 10.58' S= 2.00%
12	2500 GALLON, SINGLE COMPARTMENT SEPTIC TANK. WILBERT PRECAST PRODUCT 1617 OR EQUIVELENT. ADJUST RIM TO GRADE USING WILBERT PRECAST PVC RIBBED RISERS AND FIBERGLASS BOLT DOWN COVERS OR EQUIVELENT. RIM EL: 495.00 I.E. (IN)= 486.86 I.E. (OUT)= 486.61
13	2500 GALLON, SINGLE COMPARTMENT SEPTIC TANK. WILBERT PRECAST PRODUCT 1617 OR EQUIVELENT. ADJUST RIM TO GRADE USING WILBERT PRECAST PVC RIBBED RISERS AND FIBERGLASS BOLT DOWN COVERS OR EQUIVELENT. RIM EL: 495.00 I.E. (IN)= 487.71 I.E. (OUT)= 486.92
14	6" PVC SDR-35 PIPE. L= 9.36' S= 2.00%
15	6" PVC SDR-35 PIPE. L= 6.99' S= 2.00%
16	6" PVC SDR-35 PIPE. L= 5.00' S= 2.00% I.E. (BLDG) 487.60
17	6" PVC SDR-35 PIPE. L= 150.13' S= 2.00%
18	6" PVC SDR-35 PIPE. L= 5.00' S= 2.00% I.E. (BLDG) 490.60
19	CONNECT TO EXISTING 8" WATER MAIN WITH 8"X8"X8" TEE. CONTRACTOR TO COORDINATE TRENCHING, SHEDULING AND ALL REQUIREMENTS WITH THE CITY OF BAYVIEW WATER DEPARTMENT. CONTRACTOR TO PROVIDE EXCAVATION, BACKFILL, BEDDING AND COMPACTION FOR INSTALLATION.
20	8" PVC WATER MAIN.
21	8" GATE VALVE. SEE DETAIL SHEET FOR MORE INFORMATION.
22	2" POLYETHYLENE CLASS 200 WATER SERVICE ENDING 5.0' FROM BUILDING. PROVIDE THRUST BLOCKS PER DETAIL ON DETAIL SHEET.
23	8", 90° BEND WITH THRUST BLOCK. SEE DETAIL SHEET FOR THRUST BLOCK SPECIFICATIONS.
24	8"X8"X8" TEE WITH THRUST BLOCKS. SEE DETAIL SHEET FOR THRUST BLOCK SPECIFICATIONS.
25	FIRE SERVICE LINE ENDING 5.0' FROM BUILDING. DESIGNED / SIGNED BY FIRE PROTECTION ENGINEER.
26	8" BADGER TURBO SERIES WATER METER PER CITY OF BAYVIEW SEWER AND WATER SPECIFICATIONS.
27	FIRE HYDRANT ASSEMBLY PER TIMBERLAKE AND NORTHERN LAKES FIRE DISTRICTS, SEE DETAIL SHEET FOR MORE INFORMATION.
28	FIRE SERVICE LINE, DESIGNED / SIZED BY FIRE PROTECTION ENGINEER.
29	FIRE DEPARTMENT CONNECTION, SEE DETAIL SHEET FOR MORE INFORMATION.
30	8"X8", 90° BEND AND REDUCER WITH THRUST BLOCK. SEE DETAIL SHEET FOR THRUST BLOCK SPECIFICATIONS.
31	CONNECT TO EXISTING 8" WATER MAIN WITH 8"X8"X6" TEE. CONTRACTOR TO COORDINATE TRENCHING, SHEDULING AND ALL REQUIREMENTS WITH THE CITY OF BAYVIEW WATER DEPARTMENT. CONTRACTOR TO PROVIDE EXCAVATION, BACKFILL, BEDDING AND COMPACTION FOR INSTALLATION.

CALL BEFORE YOU DIG 428-4950

No.	DESC. / DATE	BY
4		
3		
2		
1		

SE
STORHAUG ENGINEERING
LAND SURVEYING | LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING | LAND USE PLANNING
510 EAST THIRD AVE. | SPOKANE, WA 99202
PHONE 509-242-1000 | FAX 509-242-1001

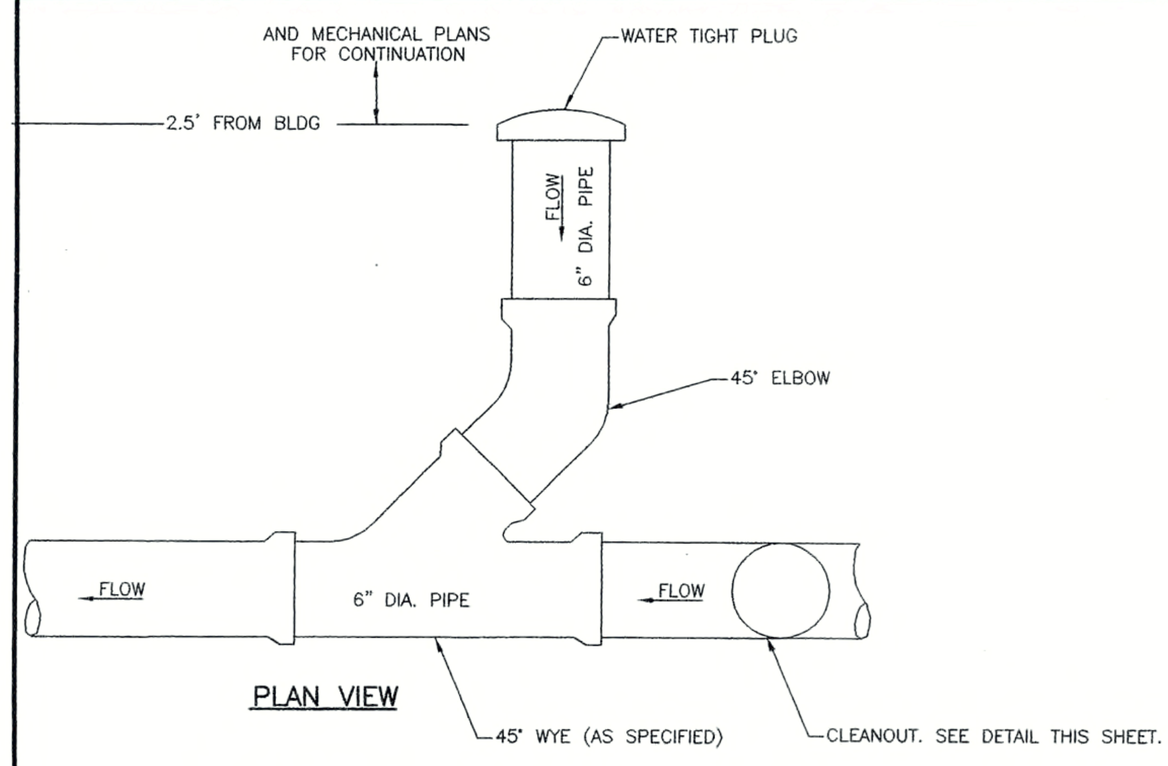
SHEET TITLE
UTILITY SHEET

PROJECT TITLE
BAYVIEW LODGE
BAYVIEW, ID

SEAL
PROFESSIONAL ENGINEER
REGISTERED
12543
STATE OF IDAHO
CARLSTON MORTENSON
5/14/08

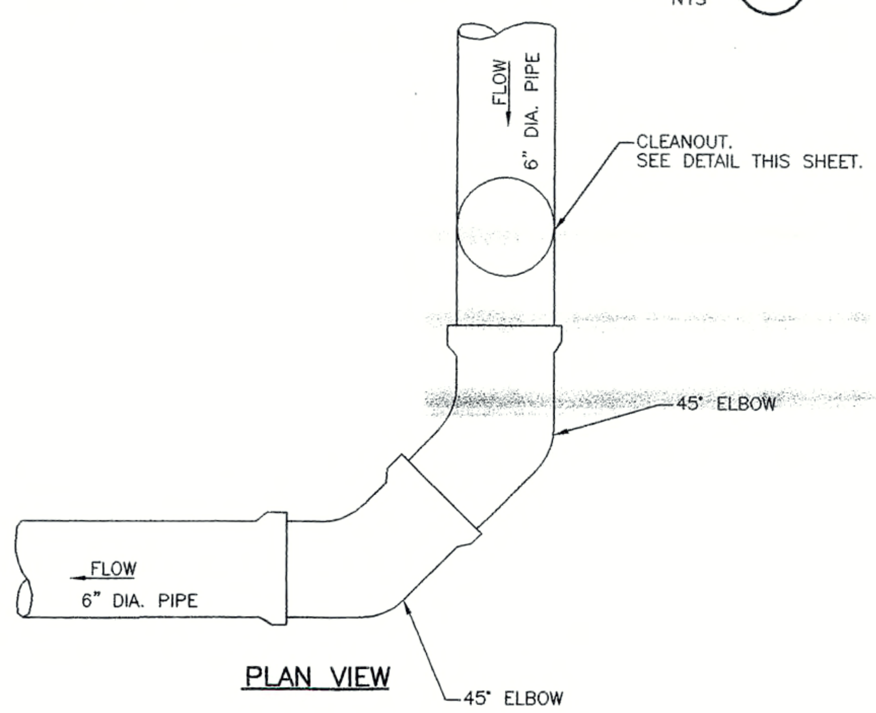
DATE 05/14/08
DRAWN DLT
CHECKED CBM
PROJECT NUMBER 07-254
DRAWING NO.
5 OF 8
UTILITY

07254-b.dwg UTILITY(5)



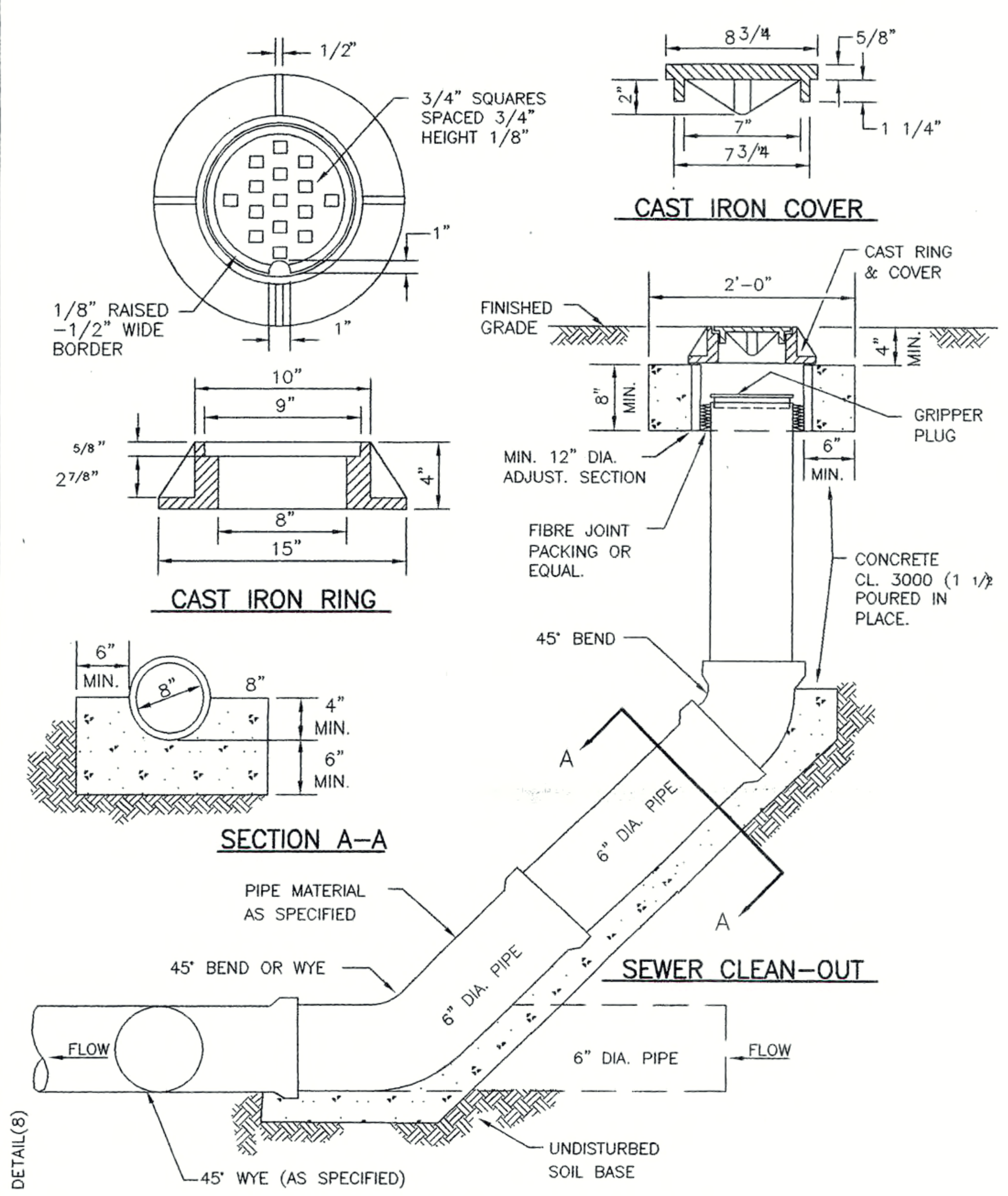
SEWER SERVICE CONNECTION DETAIL

NTS



90° BEND DETAIL

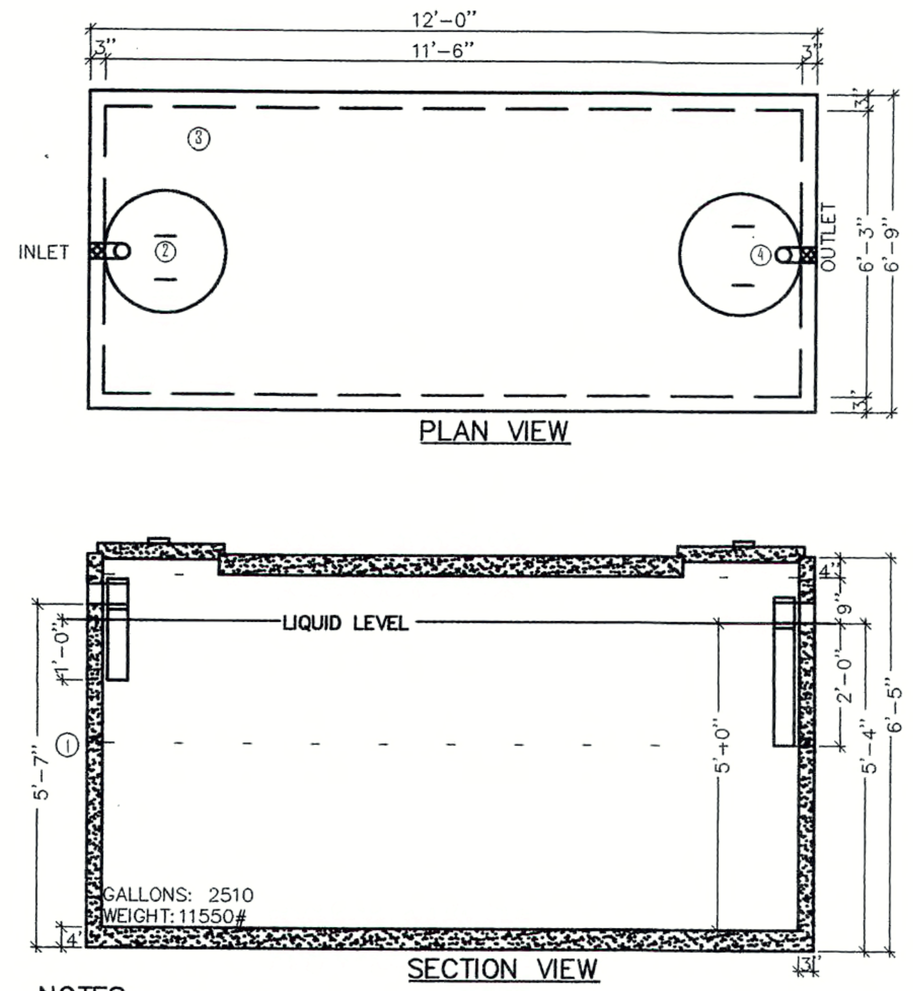
NTS



CLEANOUT DETAIL

NTS

07254-b.dwg DETAIL(8)



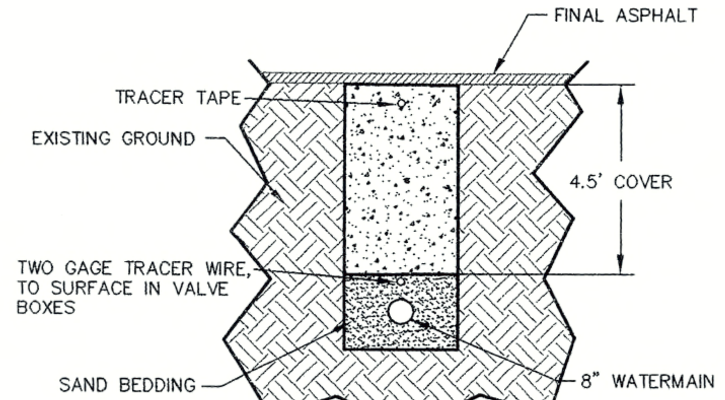
NOTES:

1. 2–PIECE CONSTRUCTION WITH BUTYL TAPE SEAL ASTM C990
2. 4" PVC TEE & BAFFLE AT INLET
3. SIDE INLET/OUTLET CONNECTION BY SPECIAL ORDER
4. 4" PVC TEE AND BAFFLE AT OUTLET
5. WE STRONGLY RECOMMEND A FILTER AT THE OUTLET OF ALL TANKS
6. 6X6 – 10/10 MESH THROUGHOUT PLUS #3 REBAR 12" O.C. IN TOP

SEPTIC TANK DETAIL

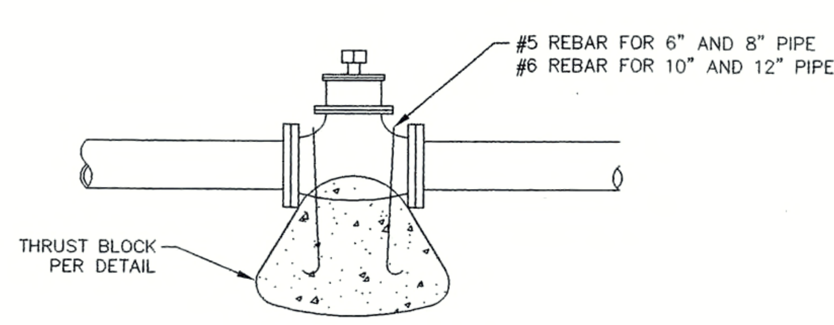
NTS

WILBERT PRECAST, INC.
2500 GALLON SEPTIC TANK SINGLE COMPARTMENT
PRODUCT NO 1617



TYPICAL WATER LINE TRENCH

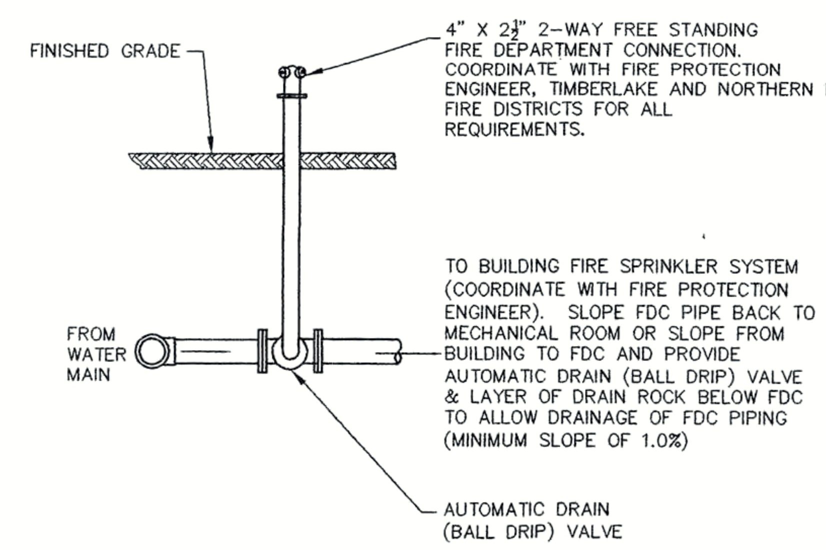
NTS



FOR VERTICAL BENDS, VALVES AND TEES OR CROSSES WITH DIRECTLY ATTACHED VALVES, PLUGS, OR BLIND FLANGES

TYPICAL STEEL STRAP INSTALLATION

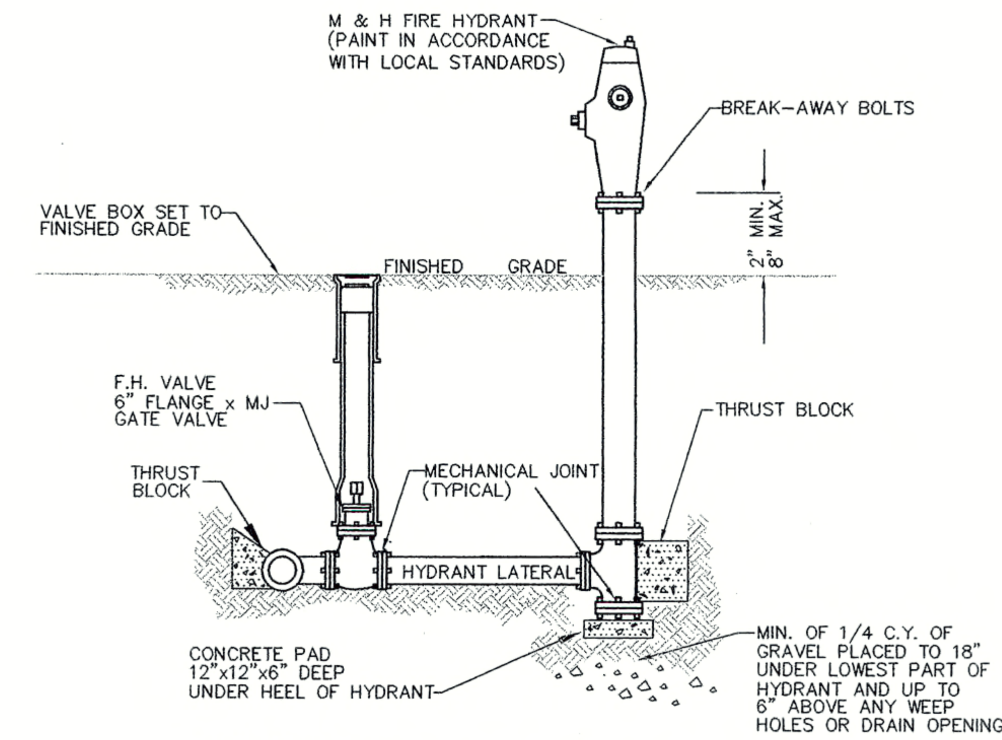
NTS



NOTE: FIRE DEPARTMENT CONNECTION ASSEMBLY SHALL CONFORM WITH NFPA REGULATIONS. PROVIDE THRUST BLOCKS PER TIMBERLAKE AND NORTHERN LAKES FIRE DISTRICTS.

FIRE DEPARTMENT CONNECTION

NTS

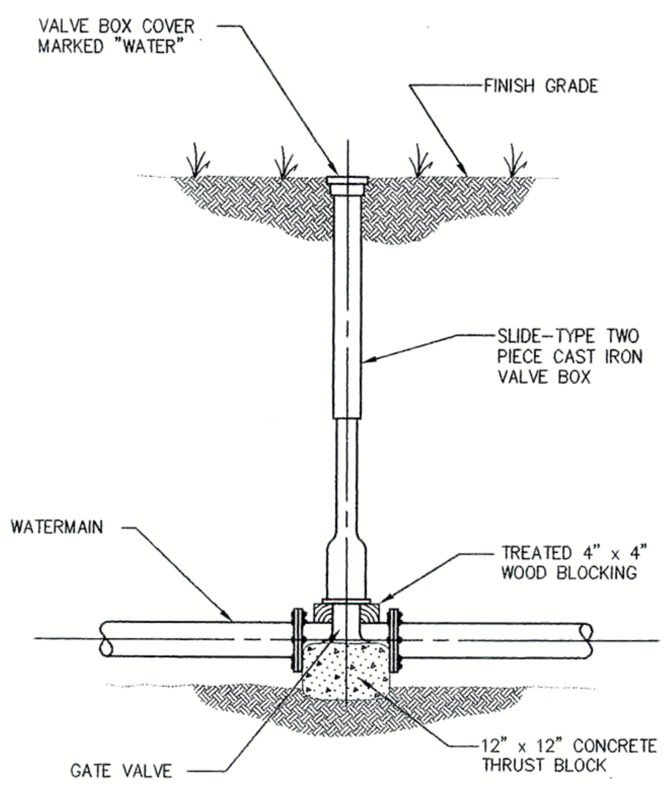


WITH SHACKLE RODS

1. 2 EA. 3/4" SHACKLE RODS MAY BE USED ON HYDRANT LATERAL IN LIEU OF THRUST BLOCKS AS APPROVED BY THE ENGINEER WHERE THE HYDRANT IS LESS THAN 12' FROM MAIN. ALL RODS & LUGS SHALL BE COATED WITH BITUMASTIC.
2. FOR INSTALLATIONS AT EXISTING MAINS, NEW TEES SHALL BE SPOOLED INTO MAIN WITH 3' +/– PVC SPOOLS & COUPLINGS AS REQ'D.

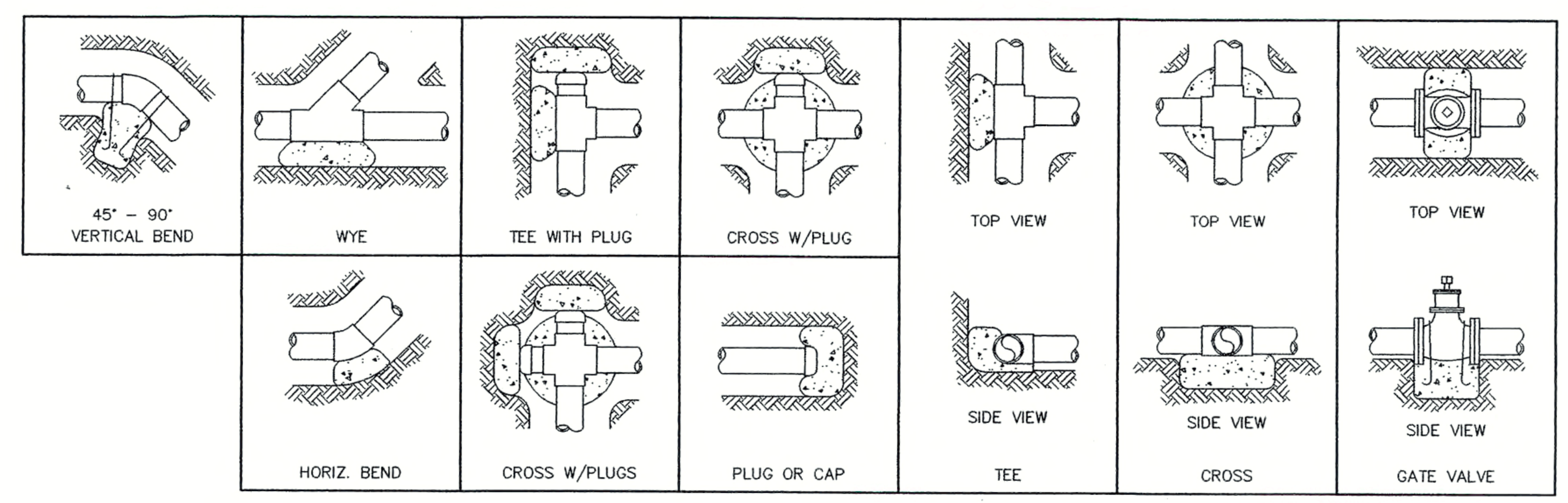
FIRE HYDRANT DETAIL

NTS



GATE VALVE INSTALLATION

NTS



THRUST BLOCK LOCATIONS

THRUST LOADS

THRUST AT FITTINGS IN LBS AT 200 LBS PER SQUARE INCH OF WATER PRESSURE					
PIPE DIAMETER	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	DEAD END OR TEE
4"	3,600	2,000	1,000	500	2,600
6"	8,000	4,400	2,300	1,200	5,700
8"	14,300	7,700	4,000	2,000	10,100
10"	22,300	12,100	6,200	3,100	15,800
12"	32,000	17,400	8,900	4,500	22,700
14"	43,600	23,600	12,100	6,100	30,800
16"	57,000	30,800	15,700	7,900	40,300

SAFE SOIL BEARING LOADS

FOR HORIZONTAL THRUSTS WHEN THE DEPTH OF COVER OVER THE PIPE EXCEEDS 2 FEET

SOIL	POUNDS PER SQUARE FOOT
MUCK, PEAT	0
SOFT CLAY	1,000
SAND	2,000
SAND & GRAVEL	3,000
SAND & GRAVEL CEMENTED W/CLAY	4,000
HARD SHALE	10,000

NOTE:
CONTRACTOR TO VERIFY TYPE OF SOIL FOR SOIL BEARING LOAD WITH ENGINEER PRIOR TO PLACEMENT OF THRUST BLOCK.

NOTES:

1.) BLOCKING SHALL BE CEMENT CONCRETE CLASS "B" POURED IN PLACE AGAINST UNDISTURBED EARTH. FITTING SHALL BE ISOLATED FROM CONCRETE THRUST BLOCK WITH PLASTIC OR SIMILAR MATERIAL.
2.) TO DETERMINE THE BEARING AREA OF THE THRUST BLOCK IN SQUARE FEET (S.F.): EXAMPLE: 12" – 90° BEND IN SAND & GRAVEL 32,000 LBS – 3,000 LB/S.F. = 10.7 S.F. OF AREA
3.) AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZE, PRESSURES AND SOIL CONDITIONS.
4.) BLOCKING SHALL BE ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATING PRESSURE UNDER ALL CONDITIONS OF SERVICE.
5.) PLASTIC BARRIER SHALL BE PLACED BETWEEN ALL THRUST BLOCKS AND FITTINGS.
6.) SEE "TYPICAL STEEL STRAP INSTALLATION DETAIL FOR ANCHOR REBAR SIZES.

THRUST BLOCK DETAIL

NTS

CALL BEFORE YOU DIG 428-4950

No.	DESC. / DATE	BY
4		
3		
2		
1		

STORHAUG ENGINEERING
LAND SURVEYING | LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING | LAND USE PLANNING
510 EAST THIRD AVE | SPOKANE, WA 99202
PHONE 509-242-1000 | FAX 509-242-1001

SHEET TITLE: DETAIL SHEET

PROJECT TITLE: BAYVIEW LODGE
BAYVIEW, ID

SEAL: PROFESSIONAL ENGINEER REGISTERED 12543 STATE OF IDAHO CHRISTOPHER MORTENSON 5/14/08

DATE	05/14/08
DRAWN	DLT
CHECKED	CBM
PROJECT NUMBER	07-254
DRAWING NO.	8 OF 8
	DETAIL

ULRICH'S BUENA VISTA UTILITY RECORD DRAWINGS

VISTA BAY, BAYVIEW KOOTENAI COUNTY, IDAHO

GENERAL CONSTRUCTION NOTES

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL SECURE ALL PERMITS AND APPROVALS AS REQUIRED BY KOOTENAI COUNTY PLANNING AND BUILDING DEPARTMENT, LAKES HIGHWAY DISTRICT, AND THE BAYVIEW SEWER AND WATER DISTRICT.

2. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES IN ACCORDANCE TO THE LATEST EDITION OF THE STATE OF IDAHO CATALOG OF STORM WATER BEST MANAGEMENT PRACTICES FOR IDAHO CITIES AND COUNTIES.

3. UNLESS OTHERWISE INSTRUCTED, THE CONTRACTOR SHALL RESTORE SURFACE CONDITIONS TO LIKE CONDITIONS OR BETTER. ALL DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER. ALL AREAS DEVOID OF VEGETATION SHALL BE RESEEDED IN ACCORDANCE TO THE (I.S.P.W.C.) AND TO THE SATISFACTION OF THE KOOTENAI COUNTY PLANNING AND BUILDING DEPARTMENT.

4. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COORDINATING COMPACTION TESTING WITH AN INDEPENDENT GEO-CONSULTANT. ALL COMPACTION TEST AND INTERVALS SHALL CONFORM TO THE IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION. CONTRACTOR SHALL SUBMIT CERTIFIED TEST RESULTS TO THE ENGINEER OF RECORD. ALL COSTS REQUIRED FOR RE-TESTING BY ANY AGENCY SHALL BE AT THE CONTRACTOR'S EXPENSE.

5. CONTRACTOR SHALL MECHANICALLY COMPACT ALL TRENCH BACKFILL IN ACCORDANCE TO (I.S.P.W.C) LATEST EDITION AND AS REQUIRED HEREON.

6. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL REQUEST LOCATES FOR ALL UNDERGROUND UTILITIES BY CONTACTING THE "CALL BEFORE YOU DIG" AT 1-800-428-4950 AT LEAST 48 HOURS PRIOR TO STARTING ANY EXCAVATION.

7. EXISTING AND FUTURE LOCATION OF ALL UTILITIES SHOWN ON THESE PLANS ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR THE PROTECTION OF ALL EXISTING UTILITIES AND SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES ON ALL FUTURE UTILITY LOCATIONS PRIOR TO STARTING WORK. THE CONTRACTOR SHALL HOLD THE OWNER AND ENGINEER HARMLESS FOR ANY UTILITIES NOT SHOWN OR NOT SHOWN IN THE LOCATION CONTAINED HEREIN.

8. UNLESS OTHERWISE PREARRANGED, THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION ACTIVITIES, EQUIPMENT, MATERIALS AND STAGING AREAS WITHIN PRIVATE PROPERTY AND OUTSIDE OF TRAFFIC TRAVEL ZONES. ALL DAMAGES TO PUBLIC OR PRIVATE PROPERTY INCURRED DURING CONSTRUCTION SHALL BE RESTORED TO EQUAL OR BETTER CONDITIONS AT THE CONTRACTOR'S EXPENSE.

9. AT ALL TIMES, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAINTAINING THE PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE, USABLE CONDITION. ANY SPILLS AND CONSTRUCTION DEBRIS DEPOSITED OFF-SITE DURING CONSTRUCTION SHALL BE PROMPTLY AND SAFELY REMOVED FROM PUBLIC PROPERTY AT THE CONTRACTOR'S EXPENSE.

10. THE CONTRACTOR SHALL IMPLEMENT PROVISIONS TO PROTECT ALL SURVEY MONUMENTS. REPLACEMENT OF ALL SURVEY MONUMENTS SHALL BE AT THE CONTRACTOR'S EXPENSE AND SHALL BE REESTABLISHED BY A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF IDAHO, AND IN ACCORDANCE WITH IDAHO CODE.

11. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE CONSTRUCTION DOCUMENTS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL STOP WORK IMMEDIATELY AND THE OWNER AND ENGINEER OF RECORD SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION. THE ENGINEER OF RECORD RESERVES THE RIGHT TO MAKE CHANGES IN GRADE OR ALIGNMENT IN THE FIELD AS NEEDED.

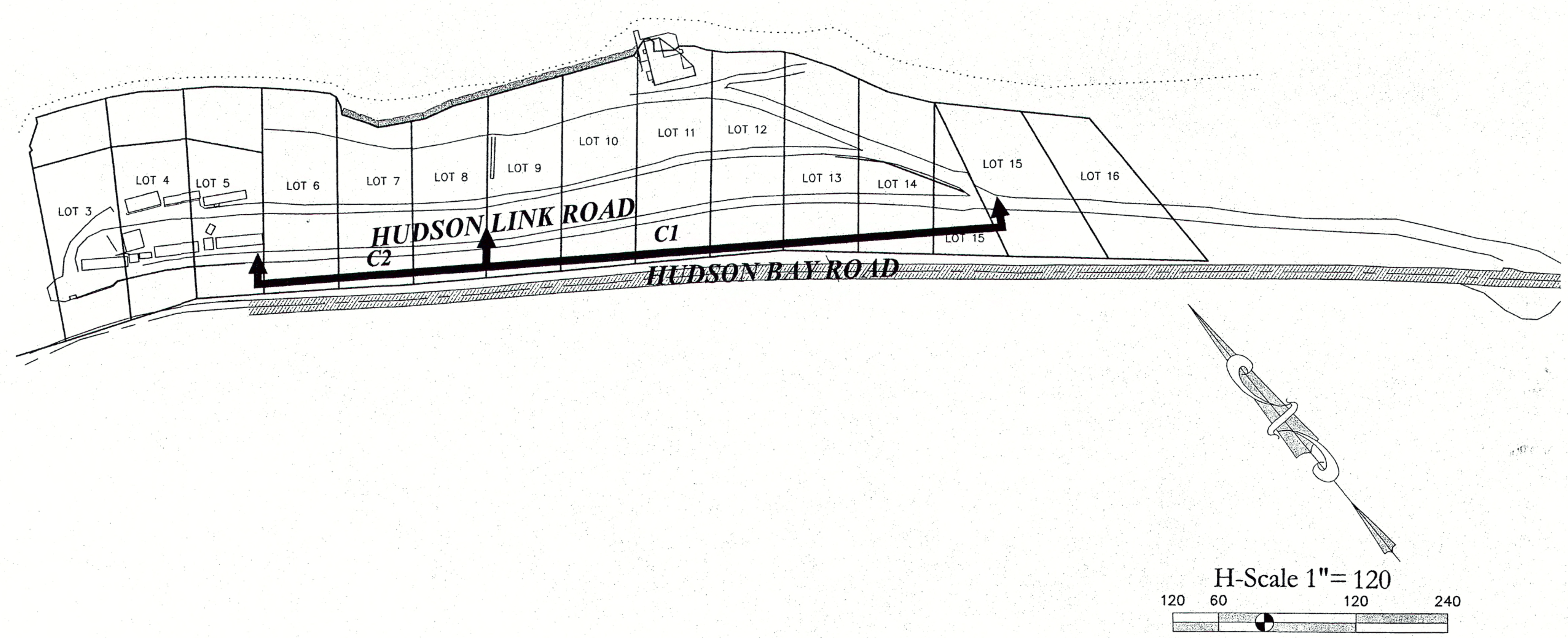
12. THE CONTRACTOR SHALL FORMERLY PROPOSE A WRITTEN REQUEST TO THE ENGINEER OF RECORD FOR ALL CONSTRUCTION STAKING REQUESTS WITH A MINIMUM 48 HOUR NOTIFICATION.

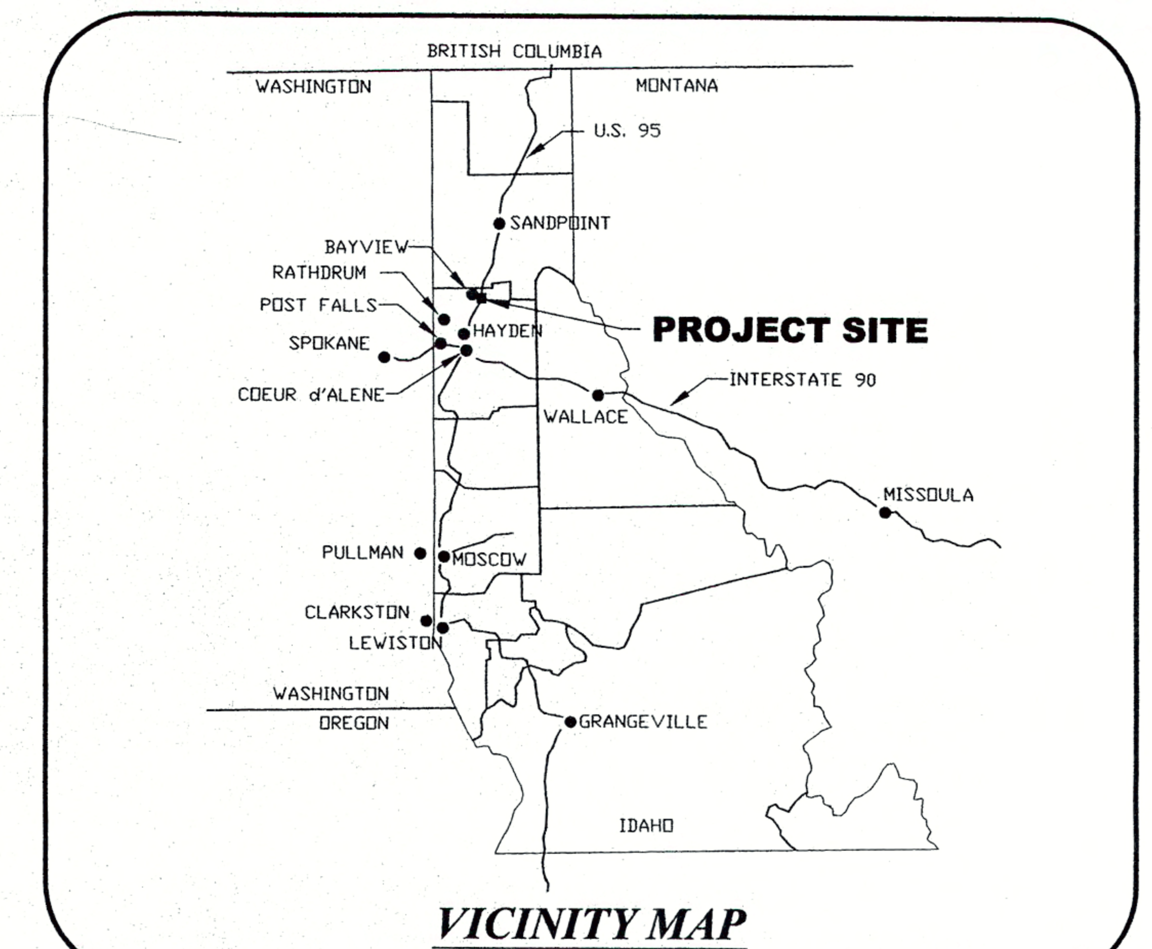
13. THE CONTRACTOR SHALL REFER TO HUDSON LINK ROAD CONSTRUCTION PLANS FOR STREET AND STORMWATER IMPROVEMENTS.

14. ACCESS AND UTILITY EASEMENTS ARE NOT SHOWN AND SHALL BE SECURED UNDER A SEPARATE INSTRUMENT PRIOR TO AS-BUILT CERTIFICATION.

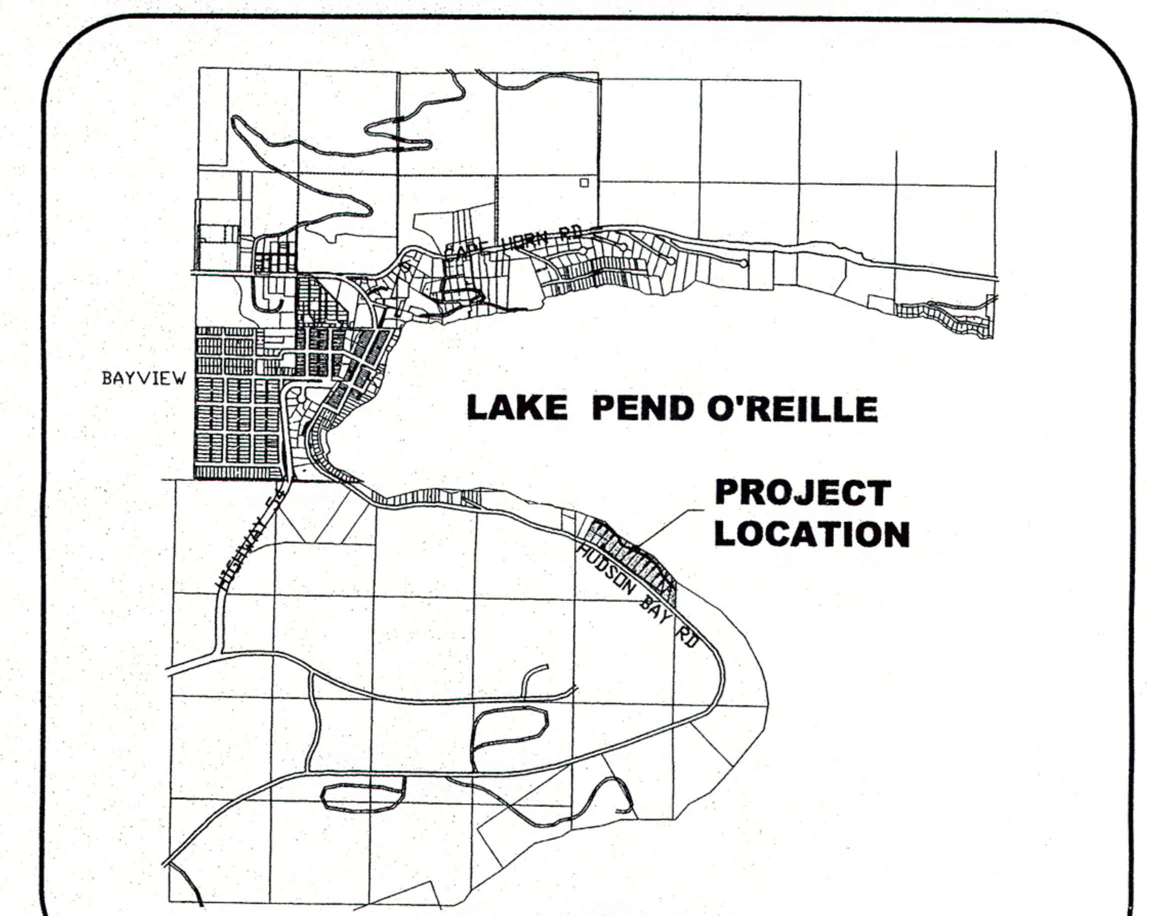
15. ALL SEPTIC TANK EFFLUENT LINES, FITTINGS AND RELATED APPURTENANCES SHALL MEET SDR35 PVC PRESSURE RATING OR EQUIVALENT. THE CONTRACTOR SHALL PROVIDE SUBMITTED CHANGES IN CONFORMANCE TO ISPWC.

16. ALL SEWER (SEPTIC TANK EFFLUENT) AND WATER WORK SHALL CONFORM TO LATEST EDITION OF ISPWC AND BAYVIEW SEWER AND WATER DISTRICTS STANDARDS AND AWWA REQUIREMENTS.





VICINITY MAP
NTS



VICINITY MAP
NTS

SITE INFORMATION

OWNER INFORMATION:

WATERFORD PARK HOMES, LLC
9702 N. RAMSEY RD.
HAYDEN, ID 83835

LEGAL DESCRIPTION

ULRICH'S BUENA VISTA BEACH
LOT 6 THROUGH LOT 14
LOT 15 EX TAX #8270 02 53N 02W

HIGHWAY DISTRICT

LAKES HIGHWAY DISTRICT
P. O. BOX 460
HAYDEN LAKE, ID 83835
PHONE: (208) 772-7527

WATER AND SEWER PURVEYOR

BAYVIEW WATER AND SEWER DISTRICT
16401 E. EMERSON DRIVE
BAYVIEW, ID 83803
PHONE: (208) 683-3948

LEGEND

- PROPERTY PIN
- STREET SIGN
- FIRE HYDRANT
- MAIL BOX
- WATER METER
- POWER POLE
- GUY WIRE
- STREET LIGHT
- WATER VALVE
- THRUST BLOCK
- DRYWELL
- UTILITY BOX
- C12 — CULVERT
- ROADSIDE DITCH
- SILT FENCE
- W — WATER MAIN
- SS> — SEPTIC SEWER
- OHM — ORDINARY HIGH-WATER MARK

AS-BUILT NOTE:

SOME INFORMATION CONTAINED HEREIN HAS BEEN SUPPLIED BY THE CONTRACTOR IN ACCORDANCE WITH IDAHO CODE.

INC
INLAND NORTHWEST CONSULTANTS
ENGINEERS • SURVEYORS • PLANNERS
1296 Polston Avenue, Suite B, Post Falls, Idaho 83854
PHONE (208) 773-8370 www.inlandnwc.com FAX (208) 777-2128

SHEET INDEX

T1 TITLE SHEET WITH VICINITY MAP, SHEET INDEX AND OVERVIEW
1 DELETED ~~OV1 OVERVIEW OF SEWER AND WATER SERVICES~~
C1 HUDSON LINK ROAD AREA LOTS 9-15
C2 HUDSON LINK ROAD AREA LOTS 6-9
1 DELETED ~~C3 HUDSON LINK ROAD AND CONNECTION WATER LINE PROFILES~~
1 DELETED ~~C4 LOWER ROAD WATER LINE PROFILE~~
D1 CONSTRUCTION DETAILS & SPECIFICATIONS
D2 CONSTRUCTION DETAILS & SPECIFICATIONS

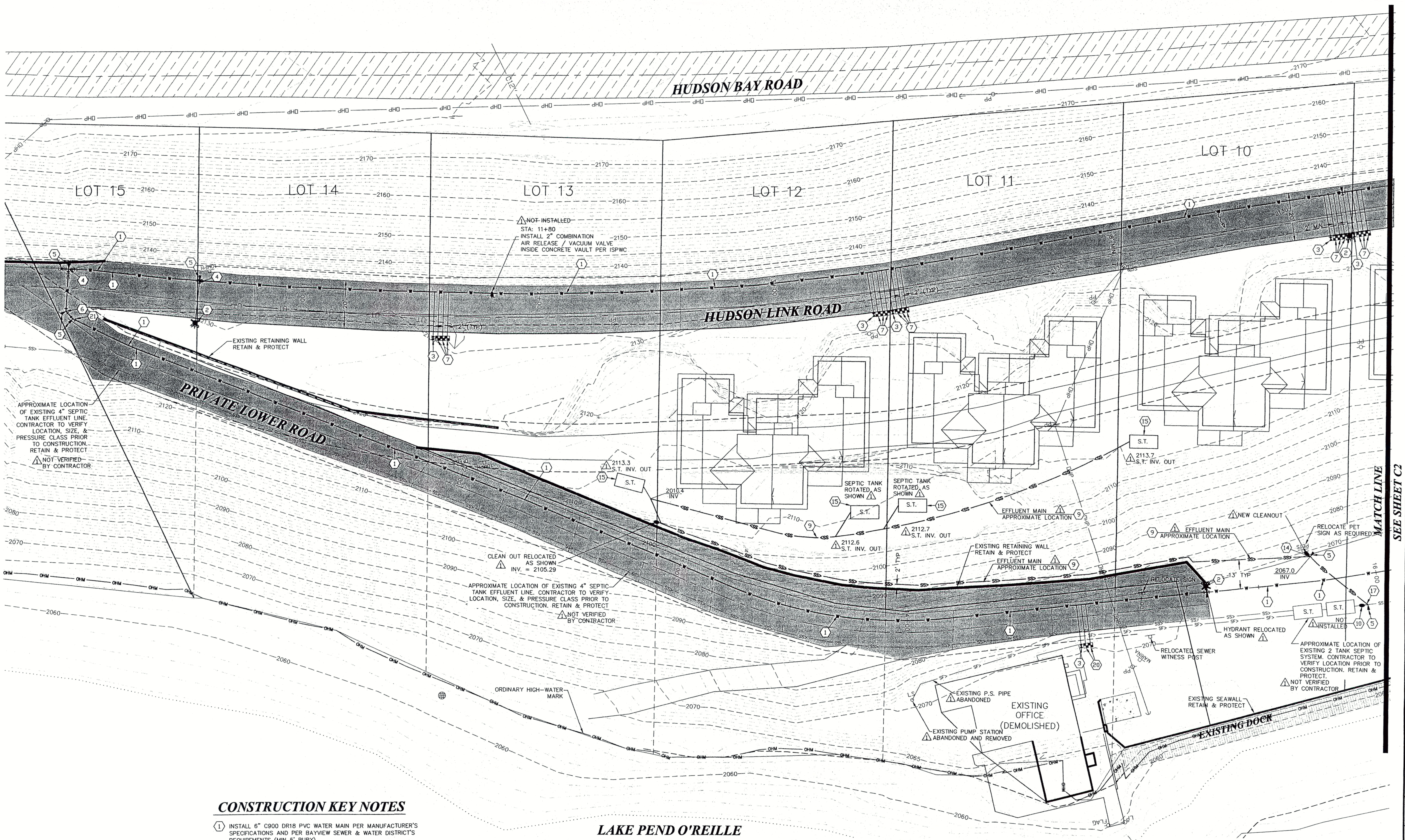
PROFESSIONAL ENGINEER REGISTERED 11138 STATE OF IDAHO DREW C. DITTMAN
4/13/09

UNDERGROUND SERVICE ALERT
ONE-CALL NUMBER
(800)428-4950
CALL TWO BUSINESS DAYS BEFORE YOU DIG

MARK	DATE	DESCRIPTION
1	10/10/08	AS-BUILTS

ISSUE DATE: 3/11/08
DRAWN BY: GLH/TLT
CHECKED BY: DCD
DWG FILE: 07240-T1.dwg
PROJ. # 07-240
SHEET TITLE:
COVER SHEET

T1



CONSTRUCTION KEY NOTES

1. INSTALL 6" C900 DR18 PVC WATER MAIN PER MANUFACTURER'S SPECIFICATIONS AND PER BAYVIEW SEWER & WATER DISTRICT'S REQUIREMENTS (MIN 5' BURY).
2. INSTALL FIRE HYDRANT ASSEMBLY PER I.S.P.W.C. AND AS SHOWN ON SHEET D1.
3. INSTALL 2 1/2" DEDICATED FIRE SPRINKLER LINE PER DETAIL SHOWN ON SHEET D2.
4. INSTALL 6" D.I. TEE PER MANUFACTURER'S SPECIFICATIONS.
5. INSTALL THRUST BLOCKING PER DETAIL SHOWN ON SHEET D1.
6. INSTALL 6" 45° DI BEND PER MANUFACTURER'S SPECIFICATIONS.
7. INSTALL 1" DOMESTIC WATER SERVICES PER DETAIL SHOWN ON SHEET D1
8. INSTALL CONCRETE PIPE ANCHORS PER DETAIL SHOWN ON SHEET D1. (SPACING = 24').
9. INSTALL 4" SDR35 SEWER (SEPTIC TANK EFFLUENT) LINE PER MANUFACTURER'S SPECIFICATIONS (MIN BURY = 3'; MIN BENDING RADIUS = 75', MIN SLOPE = 0.1%)
10. INSTALL 4" CLEAN-OUT TO GRADE PER DETAIL SHOWN ON SHEET D2.
11. INSTALL 4" 90° SDR35 BEND PER MANUFACTURER'S SPECIFICATIONS.
12. INSTALL BELL RESTRAINT HARNESS ON 4" EFFLUENT LINE EVERY 24". EBBA 6500 OR EQUIVALENT PER MANUFACTURER'S SPECIFICATIONS.
13. INSTALL 4" PVC TEE SDR35 PER MANUFACTURER'S SPECIFICATIONS.
14. INSTALL 4" 45° SDR35 BEND PER MANUFACTURER'S SPECIFICATIONS.
15. INSTALL 1500 GALLON SEPTIC TANK W/ EFFLUENT FILTER ON DISCHARGE (OUTLET) END PER PANHANDLE HEALTH DISTRICT REQUIREMENTS AND AS SHOWN ON SHEET D2.
16. INSTALL 4" 11.25° SDR35 BEND PER MANUFACTURER'S SPECIFICATIONS.
17. INSTALL 4" PVC SDR35 WYE PER MANUFACTURER'S SPECIFICATIONS.
18. INSTALL 4" PVC SDR35 LONG COUPLER PER MANUFACTURER'S SPECIFICATIONS.
19. INSTALL 6" DI BLIND FLANGE PER MANUFACTURER'S SPECIFICATIONS.
20. INSTALL 3" WATER SERVICE AS SHOWN. TO SERVE EXISTING OFFICE BUILDING AND FUTURE DOCK EXPANSION.
21. INSTALL 6" 22.5° DI BEND PER MANUFACTURER'S SPECIFICATIONS.
22. INSTALL 6" RESILIENT WEDGE VALVE WITH VALVE BOX PER MANUFACTURER'S SPECIFICATIONS.

H-Scale 1"= 20'

20 10 20 40

UNDERGROUND SERVICE ALERT
ONE-CALL NUMBER
(800)428-4950
CALL TWO BUSINESS DAYS BEFORE YOU DIG

INC INLAND NORTHWEST CONSULTANTS
ENGINEERS • SURVEYORS • PLANNERS
1296 Polston Ave., Ste. B
Post Falls, Idaho 83854
PHONE (208) 773-8370
FAX (208) 773-2328
www.incnorthwest.com

PROFESSIONAL ENGINEER REGISTERED 11138 STATE OF IDAHO DREW C. DITTMAN
4/13/0

ULRICH'S BUENA VISTA UTILITY RECORD DRAWINGS

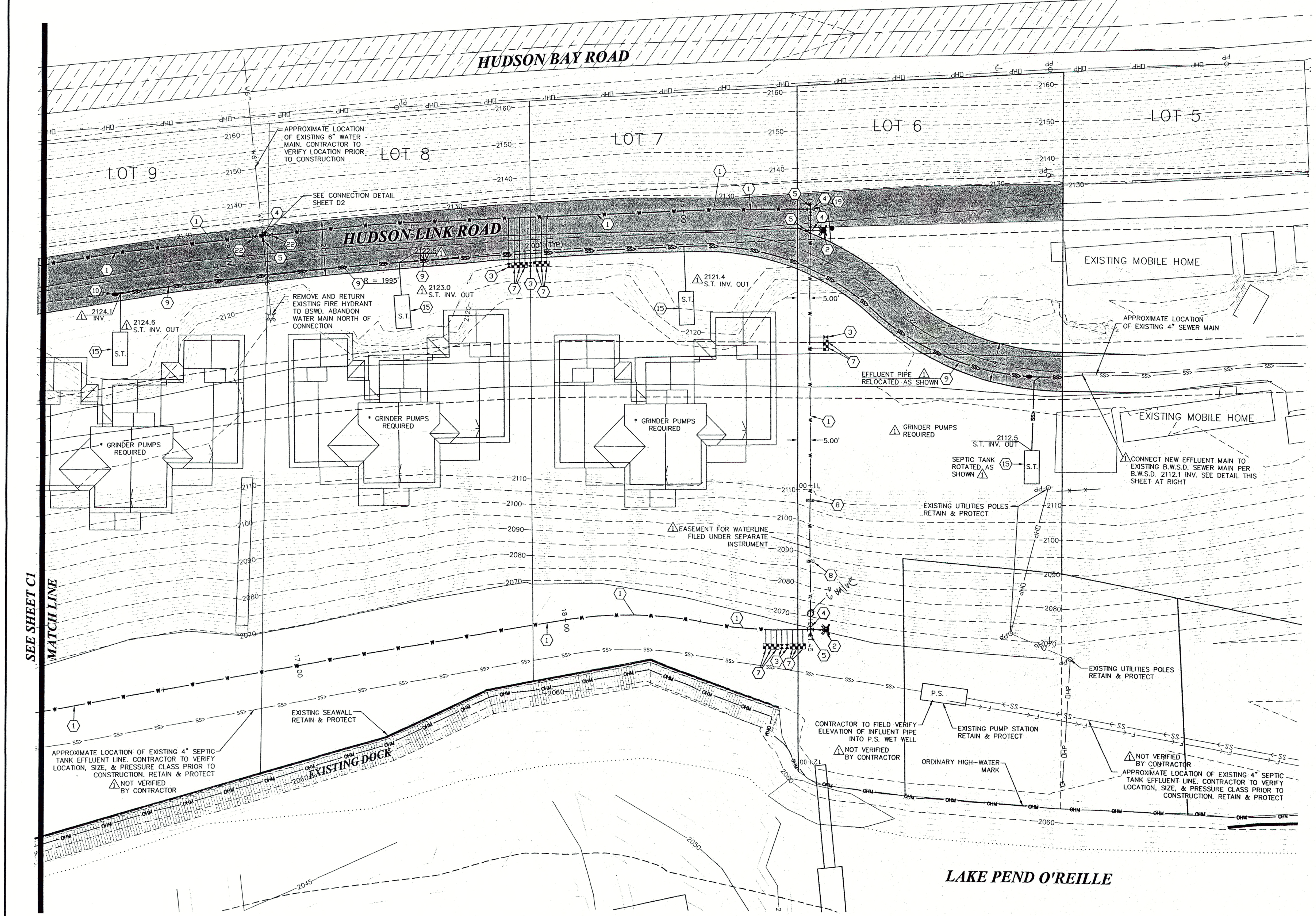
VISTA BAY, KOOTENAI COUNTY, IDAHO

MARK	DATE	DESCRIPTION
	10/10/08	AS-BUILTS

ISSUE DATE:	3/11/0
DRAWN BY:	TLT
CHECKED BY:	MLB
DWG FILE:	*C1-C
PROJ. #	07-240

SHEET TITLE:
PLAN AND PROFILE

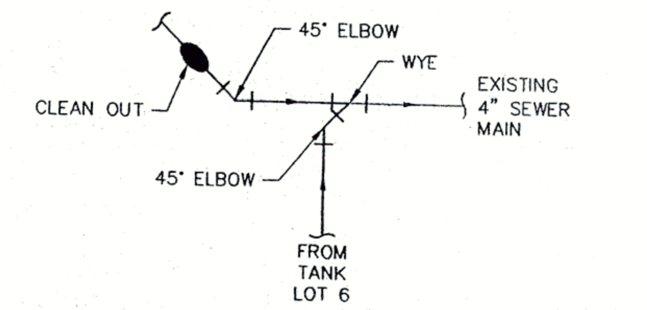
C1



CONSTRUCTION KEY NOTES

1. INSTALL 6" C900 DR18 PVC WATER MAIN PER MANUFACTURER'S SPECIFICATIONS AND PER BAYVIEW SEWER & WATER DISTRICT'S REQUIREMENTS (MIN 5' BURY).
2. INSTALL FIRE HYDRANT ASSEMBLY PER I.S.P.W.C. AND AS SHOWN ON SHEET D1.
3. INSTALL 2 1/2" DEDICATED FIRE SPRINKLER LINE PER DETAIL SHOWN ON SHEET D2.
4. INSTALL 6" D.I. TEE PER MANUFACTURER'S SPECIFICATIONS.
5. INSTALL THRUST BLOCKING PER DETAIL SHOWN ON SHEET D1.
6. INSTALL 6" 45° DI BEND PER MANUFACTURER'S SPECIFICATIONS.
7. INSTALL 1" DOMESTIC WATER SERVICES PER DETAIL SHOWN ON SHEET D1
8. INSTALL CONCRETE PIPE ANCHORS PER DETAIL SHOWN ON SHEET D1. (SPACING = 24').
9. INSTALL 4" SDR35 SEWER (SEPTIC TANK EFFLUENT) LINE PER MANUFACTURER'S SPECIFICATIONS (MIN BURY = 3'; MIN BENDING RADIUS = 75', MIN SLOPE = 0.1%)
10. INSTALL 4" CLEAN-OUT TO GRADE PER DETAIL SHOWN ON SHEET D2.
11. INSTALL 4" 90° SDR35 BEND PER MANUFACTURER'S SPECIFICATIONS.
12. INSTALL BELL RESTRAINT HARNESS ON 4" EFFLUENT LINE EVERY 24". EBBA 6500 OR EQUIVALENT PER MANUFACTURER'S SPECIFICATIONS.
13. INSTALL 4" PVC TEE SDR35 PER MANUFACTURER'S SPECIFICATIONS.
14. INSTALL 4" 45° SDR35 BEND PER MANUFACTURER'S SPECIFICATIONS.
15. INSTALL 1500 GALLON SEPTIC TANK W/ EFFLUENT FILTER ON DISCHARGE (OUTLET) END PER PANHANDLE HEALTH DISTRICT REQUIREMENTS AND AS SHOWN ON SHEET D2.
16. INSTALL 4" 11.25° SDR35 BEND PER MANUFACTURER'S SPECIFICATIONS.
17. INSTALL 4" PVC SDR35 WYE PER MANUFACTURER'S SPECIFICATIONS.
18. INSTALL 4" PVC SDR35 LONG COUPLER PER MANUFACTURER'S SPECIFICATIONS.
19. INSTALL 6" DI BLIND FLANGE PER MANUFACTURER'S SPECIFICATIONS.
20. INSTALL 3" WATER SERVICE AS SHOWN. TO SERVE EXISTING OFFICE BUILDING AND FUTURE DOCK EXPANSION.
21. INSTALL 6" 22.5° DI BEND PER MANUFACTURER'S SPECIFICATIONS.

△ CONNECTION DETAIL THIS SHEET



H-Scale 1"= 20'

20 10 20 40

UNDERGROUND SERVICE ALERT
ONE-CALL NUMBER
(800)428-4950
CALL TWO BUSINESS DAYS BEFORE YOU DIG

INLAND NORTHWEST CONSULTANTS
1296 Polston Ave., Ste. B
Post Falls, Idaho 83854
PHONE (208) 773-8370
FAX (208) 777-2128
www.incnorthwest.com

PROFESSIONAL ENGINEER REGISTERED 11138 STATE OF IDAHO DREW C. DITTMAN 4/13/09

ULRICH'S BUENA VISTA UTILITY RECORD DRAWINGS

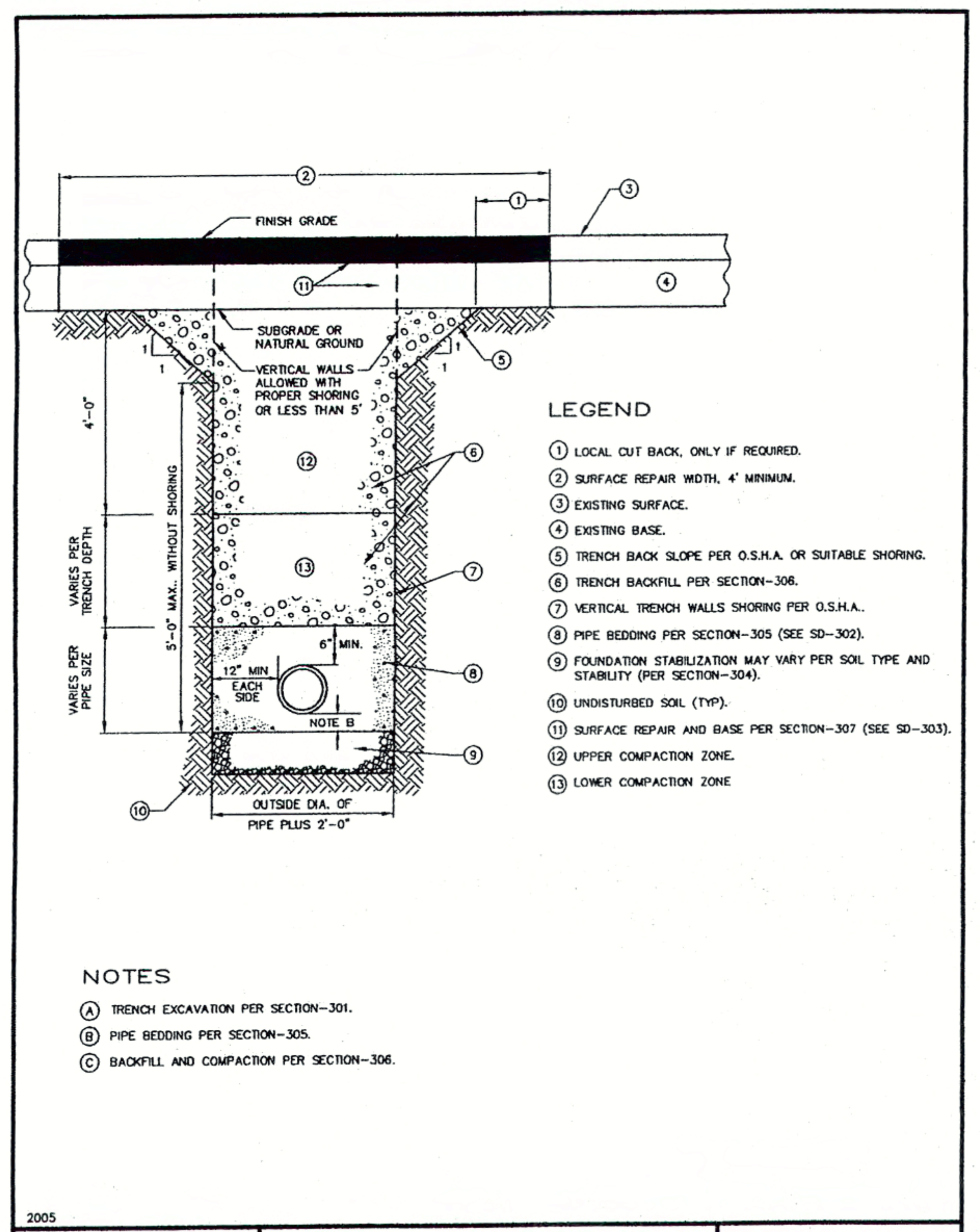
VISTA BAY, KOOTENAI COUNTY, IDAHO

MARK	DATE	DESCRIPTION
△1	10/10/08	AS-BUILTS

ISSUE DATE: 3/11/08
DRAWN BY: TLT
CHECKED BY: MLB
DWG FILE: *C1-C
PROJ. # 07-240

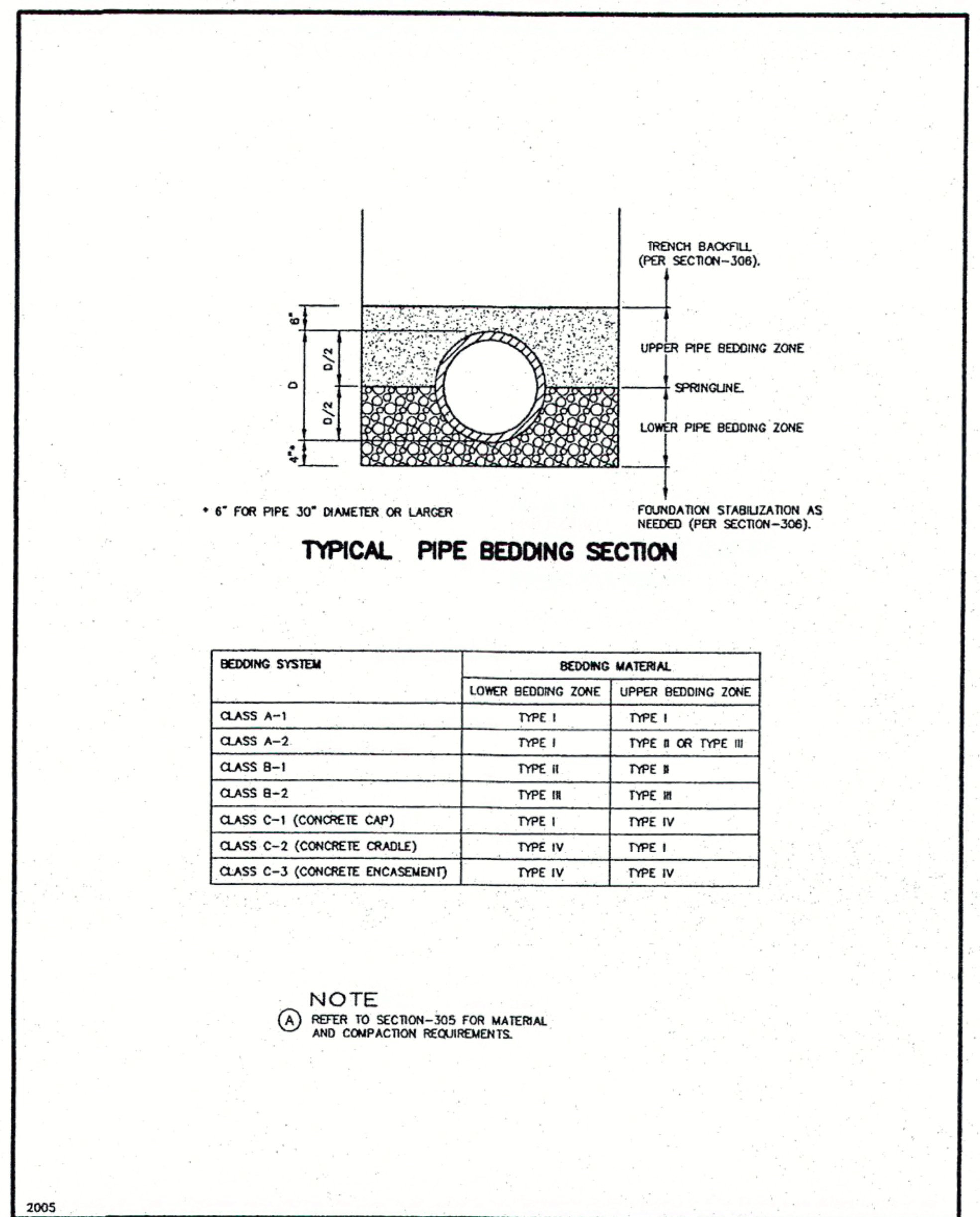
SHEET TITLE: PLAN AND PROFILE

C2



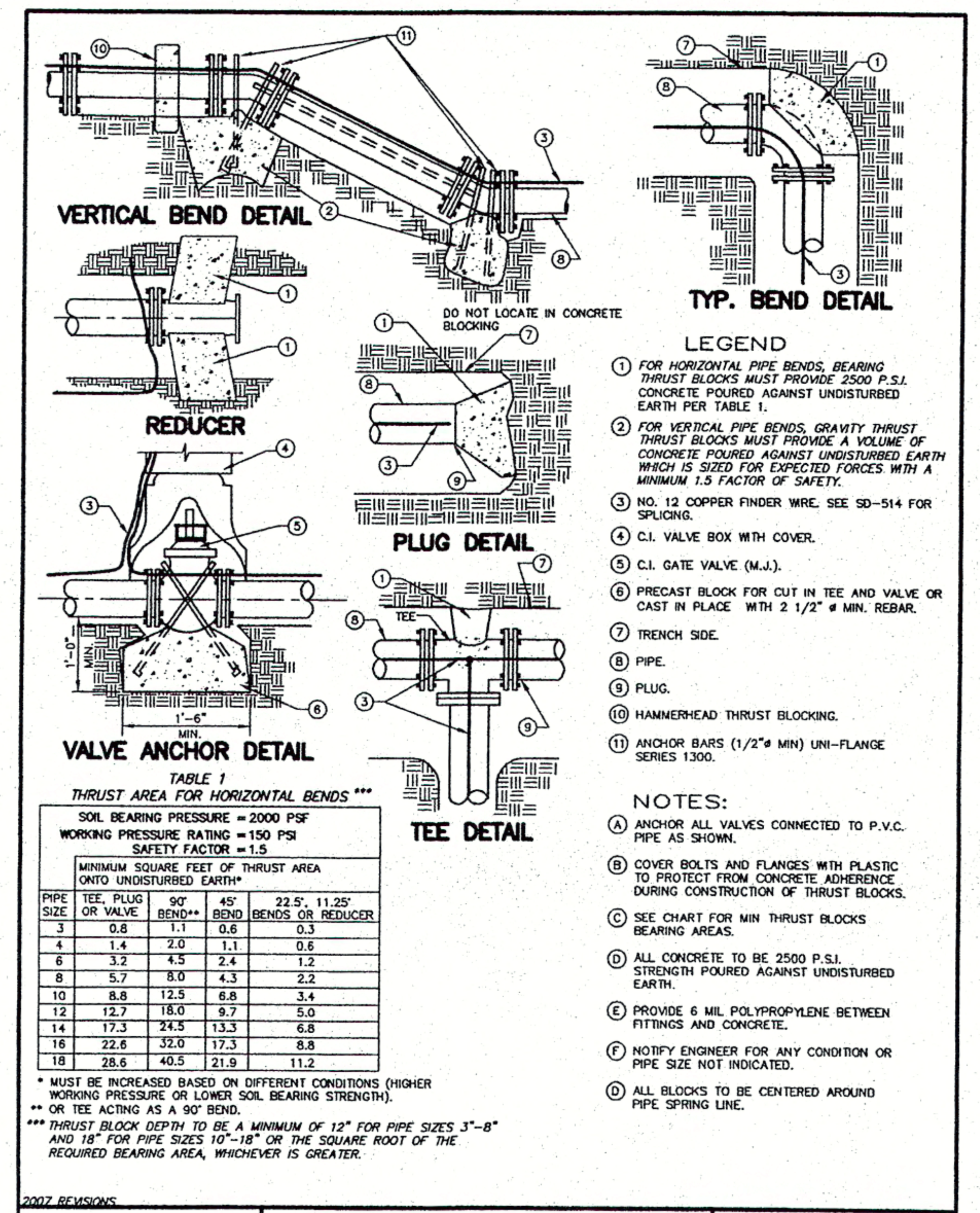
2005

IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION	TYPICAL TRENCH	STANDARD DRAWING NO. SD-301



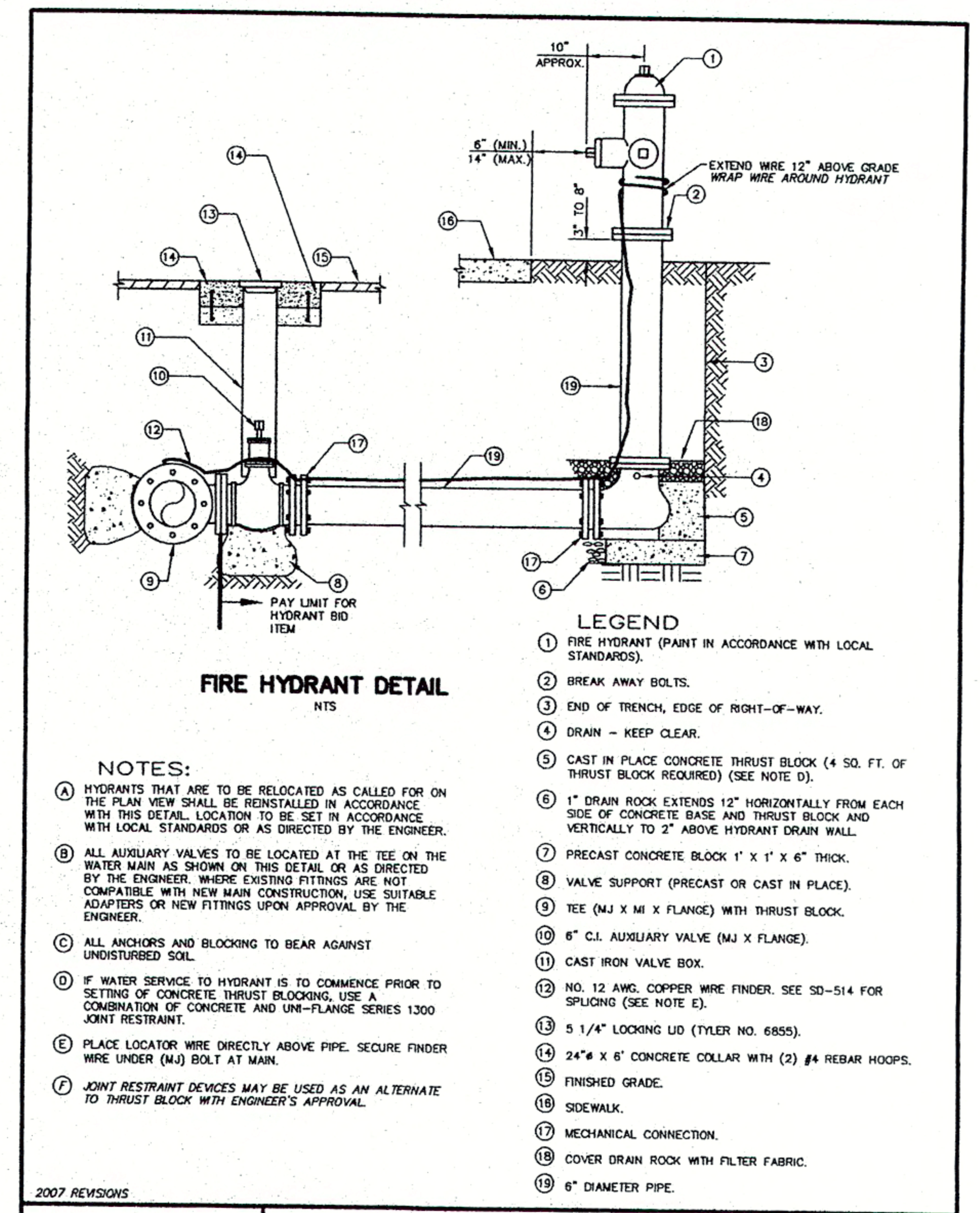
2005

IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION	TYPICAL PIPE BEDDING SECTION	STANDARD DRAWING NO. SD-302



2007 REVISIONS

IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION	THRUST BLOCK AND ANCHOR DETAILS	STANDARD DRAWING NO. SD-403

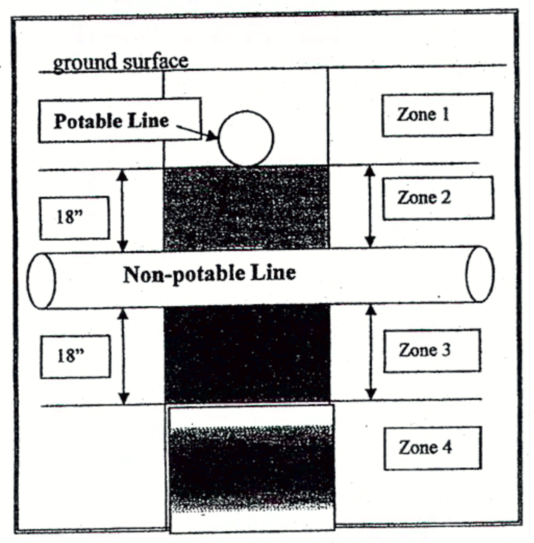


2007 REVISIONS

IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION	FIRE HYDRANT DETAIL	STANDARD DRAWING NO. SD-404

Potable and Non-Potable Line Crossings
Vertical Separation Requirements
January 2007

The term "line" applies to both main lines and service lines.



Zone 1:
A) Potable Water and Non-Potable Mains and Service Lines must be separated by at least 18 inches **and**

B) One full, uncut length of Potable pipe must be centered over the crossing so that the joints are as far as possible from the crossing.

Zone 2: Potable line <18" over top of Non-Potable line.

A) One full, uncut length of Potable Water pipe must be centered over the crossing so that the joints are as far as possible from the Non-Potable line **and**

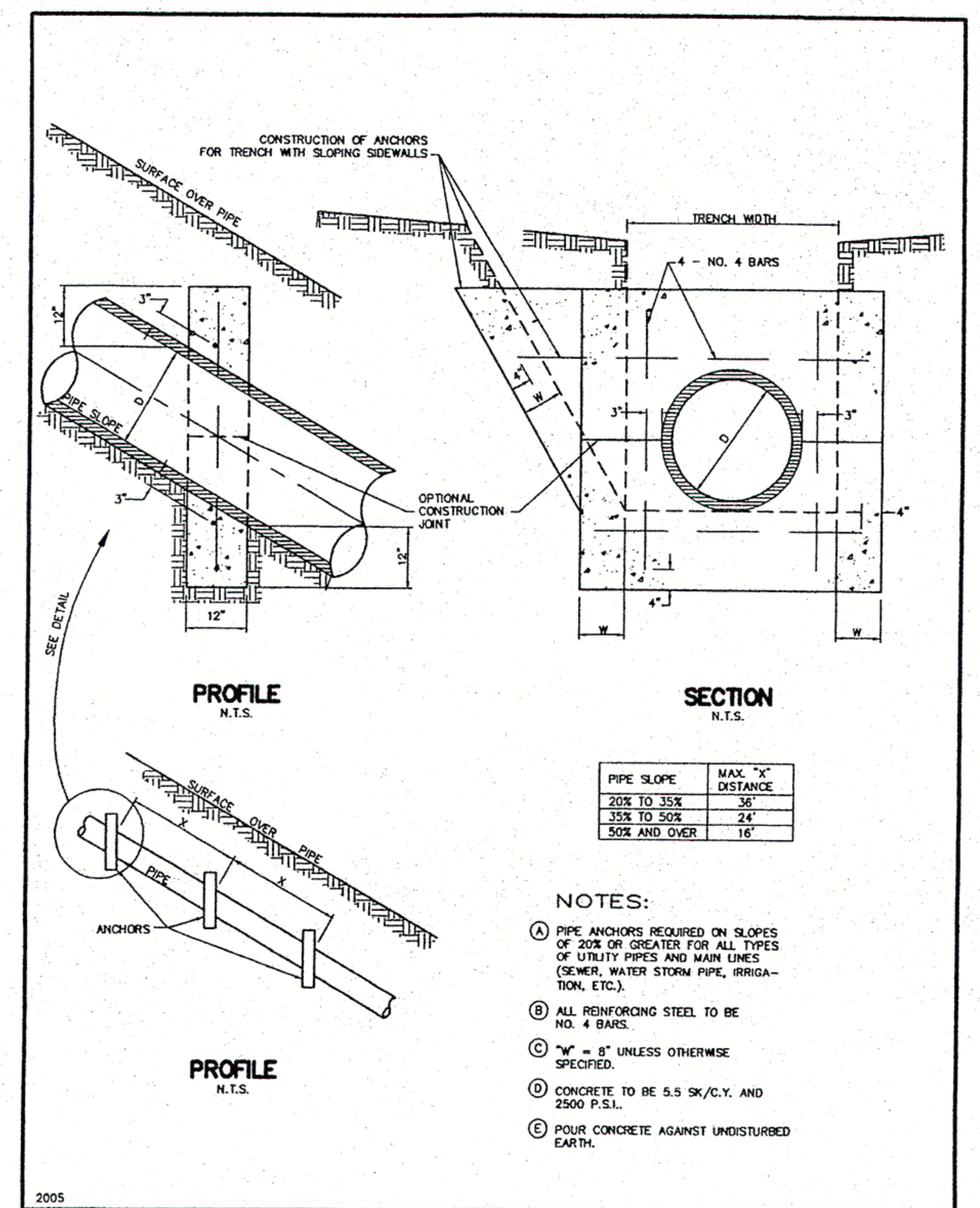
either B) Non-Potable line must be constructed to Potable water pipe standards and pressure tested for water tightness for a horizontal distance of 10 feet on both sides of the crossing,

or C) Non-Potable or potable line must be cased in a larger diameter carrier pipe for a horizontal distance of 10 feet on both sides of the crossing, with no joints.

Zone 3: Same requirements as Zone 2 except the Non-Potable line must also be supported above the crossing to prevent settling.

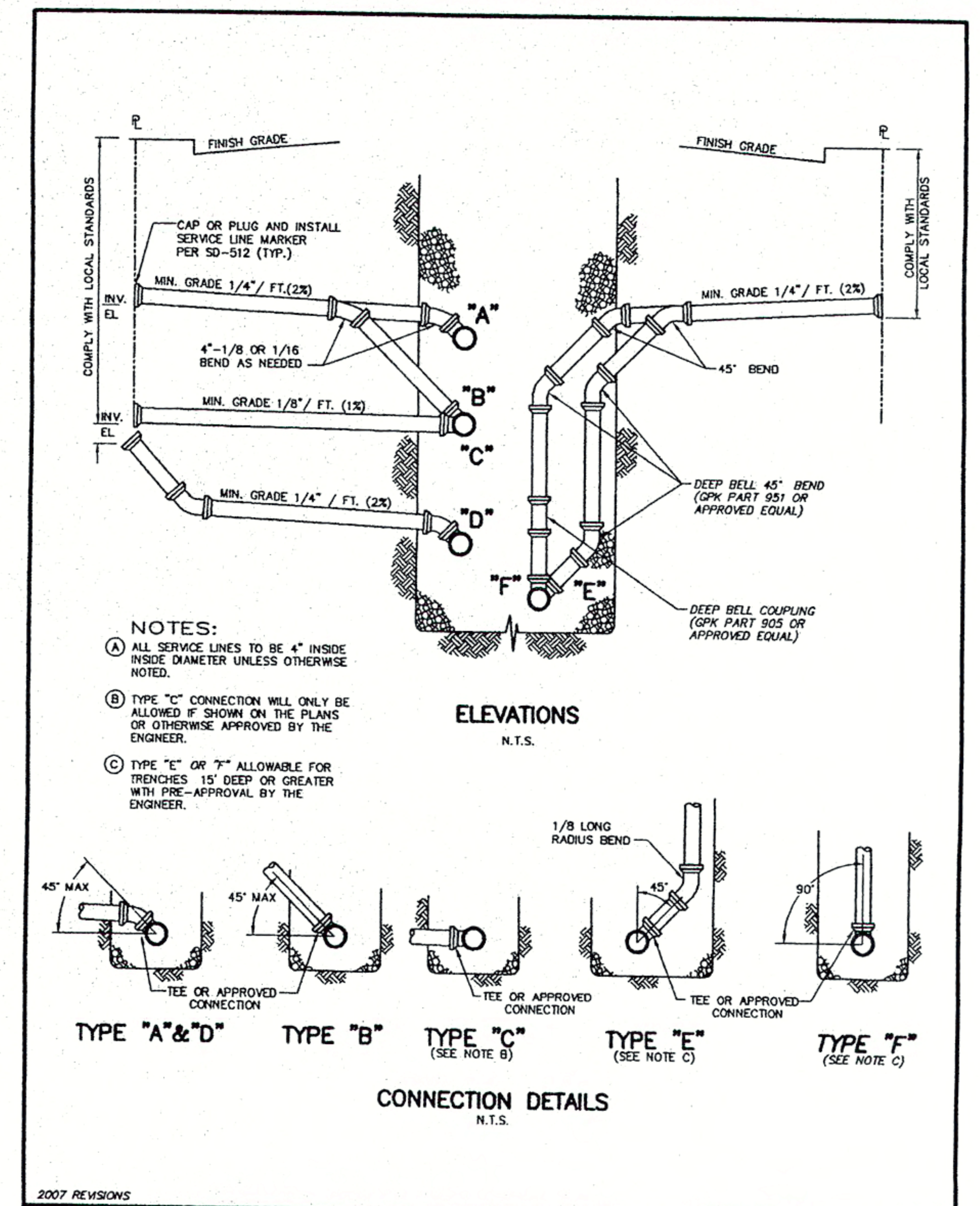
Zone 4: Same requirements as Zone 1 except the Non-Potable line must also be supported above the crossing to prevent settling.

Sewage force mains shall have at least eighteen inches of clearance from Potable Water mains and Zone 2 and 3 placements are prohibited. Separation requirements also apply to Potable and Non-Potable service lines controlled by the system owner and extending to the property line, service meter, or cleanout. Refer to IDAPA 58.01.08.542.07: Idaho Rules for Public Drinking Water Systems and IDAPA 58.01.16.430.o: Idaho Wastewater Rules.



2005

IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION	PIPE ANCHORS	STANDARD DRAWING NO. SD-510



2007 REVISIONS

IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION	STANDARD SEWER SERVICE LINES	STANDARD DRAWING NO. SD-511

UNDERGROUND SERVICE ALERT
ONE-CALL NUMBER
(800)428-4950
CALL TWO BUSINESS DAYS BEFORE YOU DIG

INLAND NORTHWEST CONSULTANTS
ENGINEERS • SURVEYORS • PLANNERS
1296 Polston Ave., Ste. B
Post Falls, Idaho 83854
PHONE (208) 773-8370
FAX (208) 777-2128
www.incnorthwest.com

PROFESSIONAL ENGINEER REGISTERED 11138 STATE OF IDAHO DREW C. DITTMAN
4/13/09

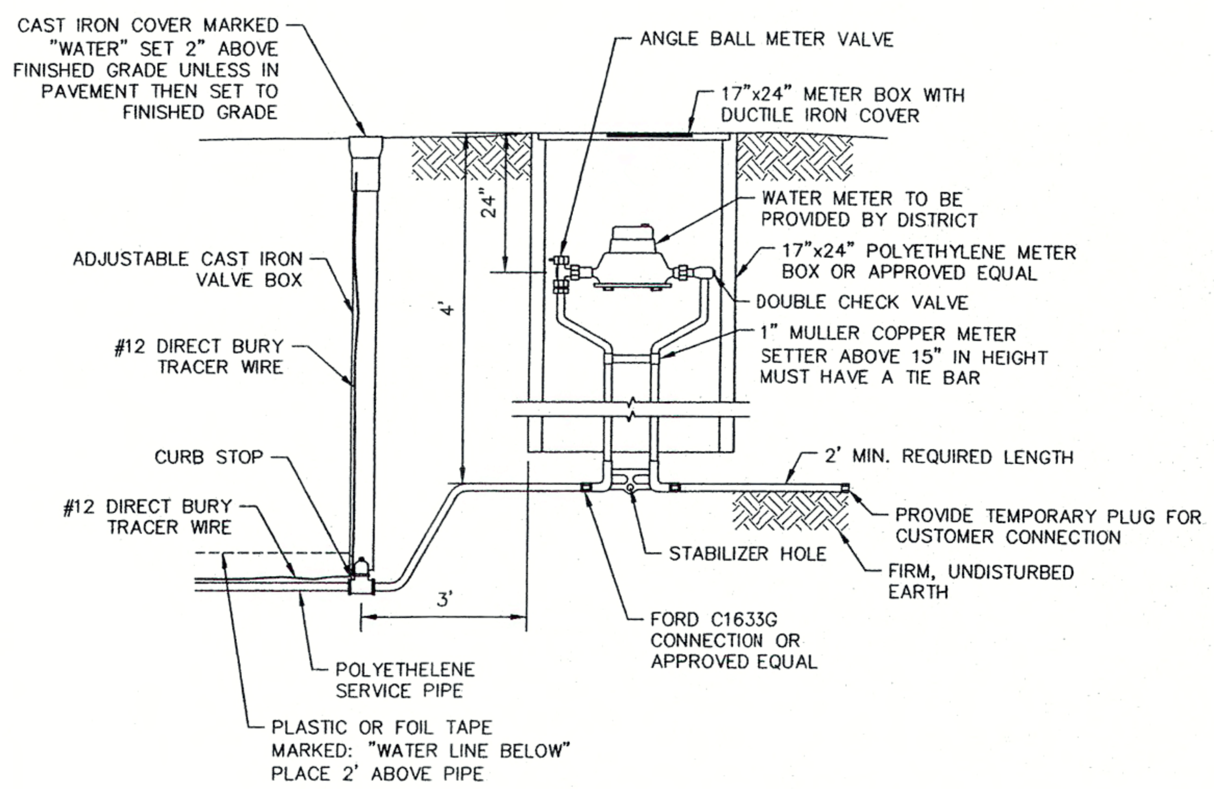
ULRICH'S BUENA VISTA UTILITY RECORD DRAWINGS
VISTA BAY, KOOTENAI COUNTY, IDAHO

MARK	DATE	DESCRIPTION
△	10/10/08	AS-BUILTS

ISSUE DATE:	3/11/08
DRAWN BY:	AJD/TLT
CHECKED BY:	DCD
DWG FILE:	*D1
PROJ. #	07-240

SHEET TITLE:
DETAIL SHEET

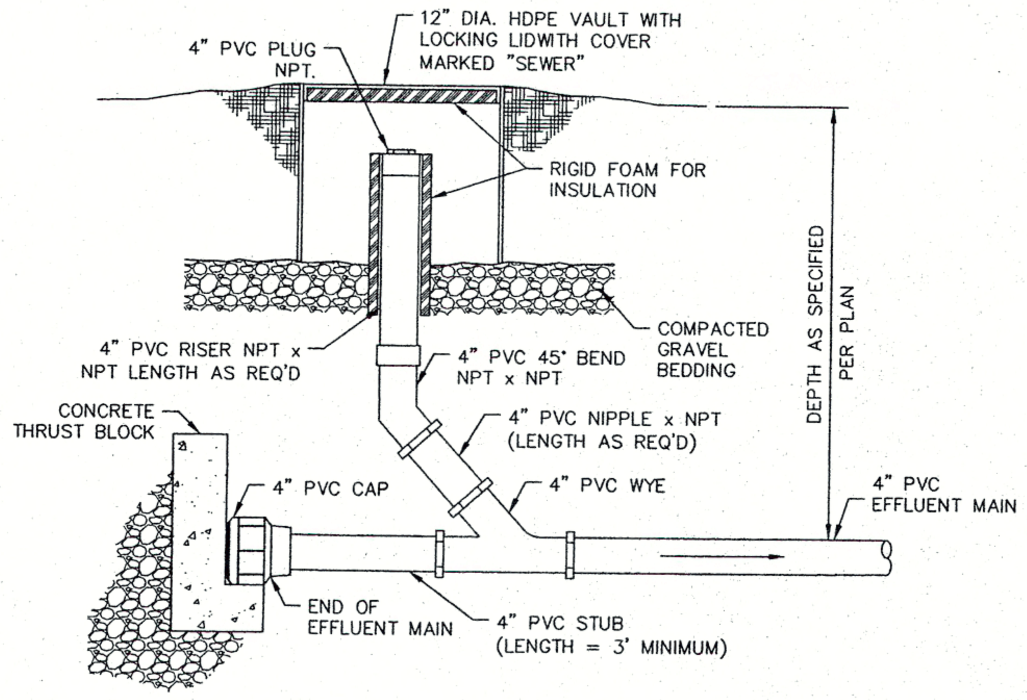
D1



TYPICAL WATER SERVICE DETAIL

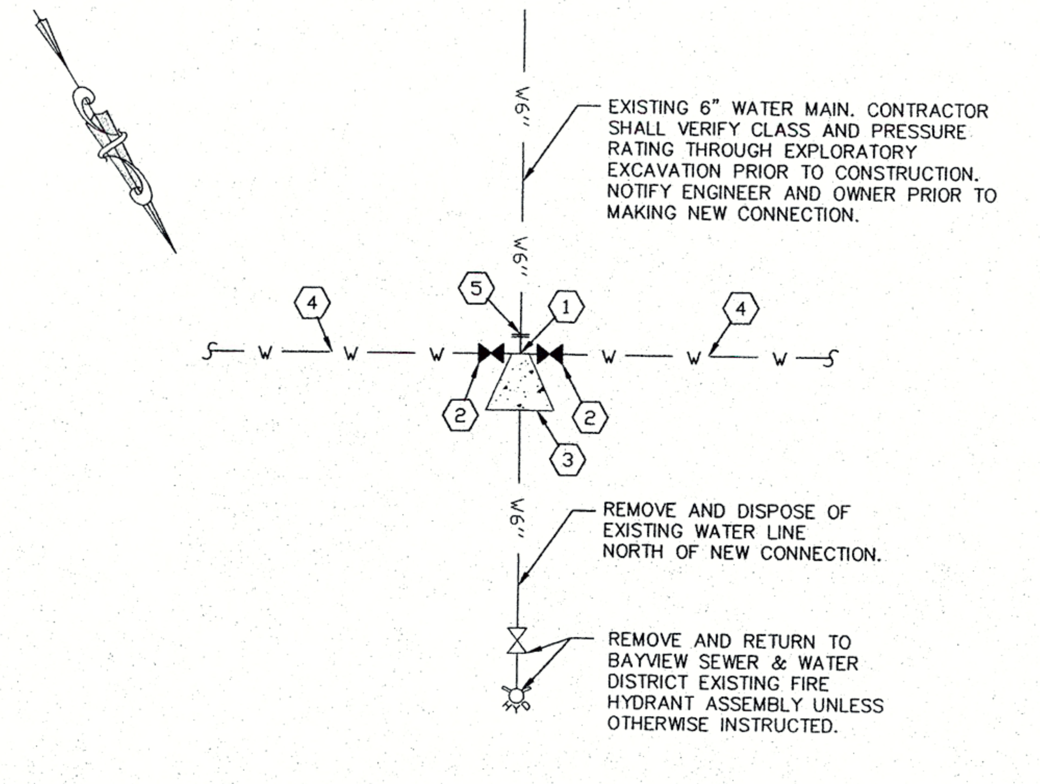
ADAPTED FROM BAYVIEW SEWER AND WATER DISTRICT

N.T.S.



EFFLUENT CLEAN OUT DETAIL

N.T.S.



(1) INSTALL 6" FLG X FLG X MJ DI TEE PER MANUFACTURER'S SPECIFICATIONS

(2) INSTALL 6" FLG X MJ RESILIENT SEAL WEDGE VALVE W/ VALVE BOX PER MANUFACTURER'S SPECIFICATIONS AND AWWA STANDARDS. EXTEND LOCATING WIRE UP ALL VALVE BOXES TO FINISH SURFACE.

(3) INSTALL CAST-IN-PLACE CONCRETE THRUST BLOCK PER ISPWC AND AS SHOWN ON SHEET D1.

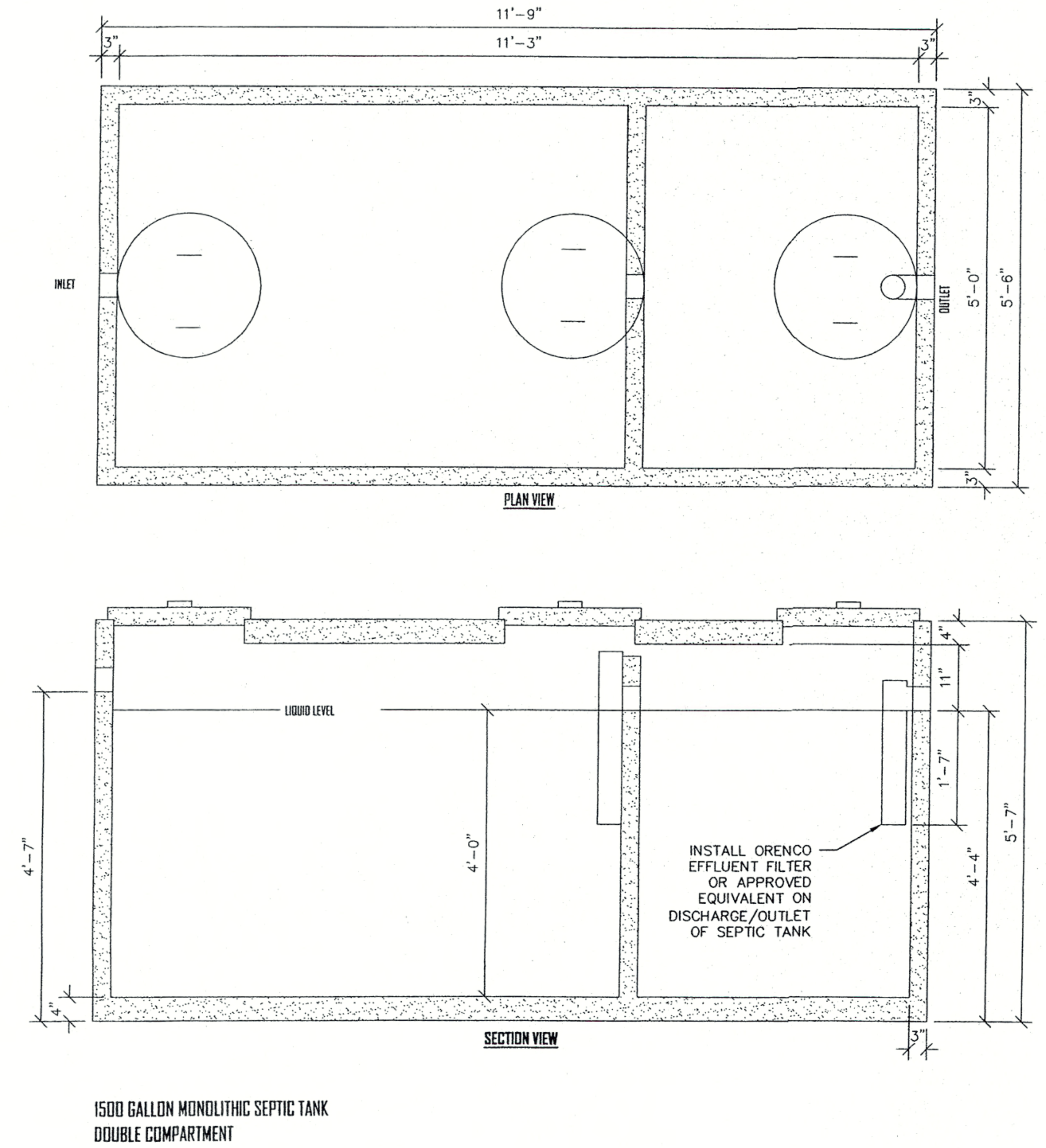
(4) INSTALL 6" C900 DR18 PVC WATER MAIN PER MANUFACTURER'S SPECIFICATIONS AND PER BAYVIEW SEWER & WATER DISTRICT REQUIREMENTS.

(5) INSTALL 6" MEGALUG JOINT RESTRAINT PER MANUFACTURER'S SPECIFICATIONS.

6" WATER MAIN CONNECTION DETAIL

STA: 16+45.00

N.T.S.

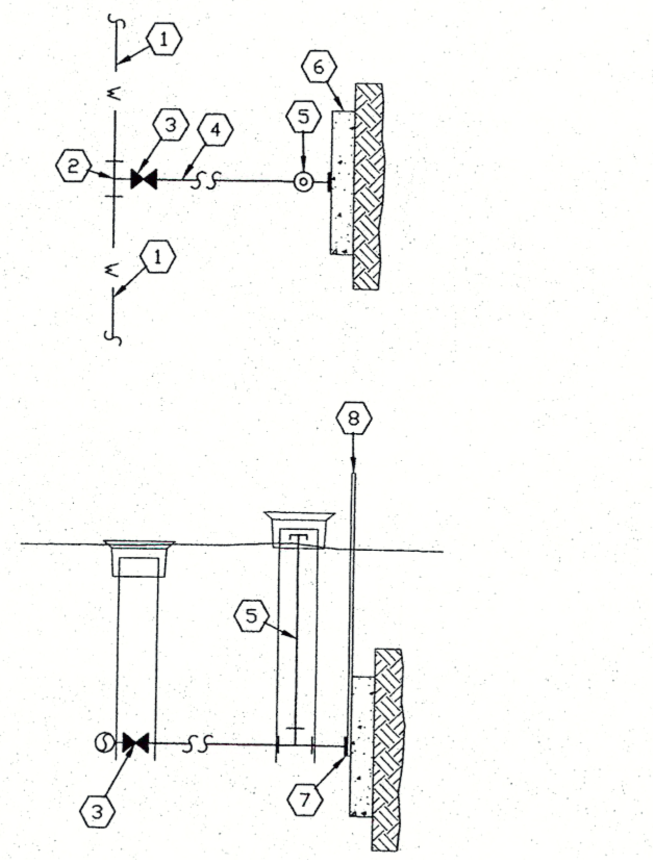


1500 GALLON MONOLITHIC SEPTIC TANK
DOUBLE COMPARTMENT

NOTES:
1. 2-PIECE CONSTRUCTION WITH BUTYL TAPE SEAL ASTM C990
2. 4" PVC TEE & BAFFLE AT INLET
3. SIDE INLET/OUTLET CONNECTION BY SPECIAL ORDER
4. 4" POLYLOK AT INLET/OUTLET
5. 6X6 – 10/10 MESH THROUGHOUT PLUS #3 REBAR 12" O.C. IN TOP

1500 GALLON SEPTIC TANK DETAIL

NOT TO SCALE



(1) INSTALL 6" C900 DR18 PVC WATER MAIN PER MANUFACTURER'S SPECIFICATIONS AND BAYVIEW SEWER & WATER DISTRICT REQUIREMENTS.

(2) INSTALL 2 1/2" SADDLE TAP ON 6" MAIN PER MANUFACTURER'S SPECIFICATIONS.

(3) INSTALL 2 1/2" FLG X MJ RESILIENT SEAL WEDGE VALVE W/ VALVE BOX PER MANUFACTURER'S SPECIFICATIONS AND AWWA STANDARDS. EXTEND LOCATING WIRE UP ALL VALVE BOXES TO FINISH SURFACE.

(4) INSTALL 2 1/2" SDR21 PVC FIRELINE PER I.S.P.W.C. BAYVIEW SEWER & WATER DISTRICT REQUIREMENTS AND LOCAL FIRE DISTRICT STANDARDS.

(5) INSTALL 2 1/2" BLOW OFF ASSEMBLY PER BAYVIEW SEWER & WATER DISTRICT AND ISPWC REQUIREMENTS.

(6) INSTALL PRECAST (SUITCASE) CONCRETE THRUST BLOCK. (TEMPORARY APPLICATION).

(7) INSTALL 2 1/2" NPT CAP OR PLUG PVC OF EQUIVALENT PRESSURE RATING AS PIPE.

(8) INSTALL TREATED 2"X4" TIMBER PAINTED BLUE AS SHOWN.

2 1/2" FIRE SPRINKLER SERVICE DETAIL

N.T.S.

UNDERGROUND SERVICE ALERT
ONE-CALL NUMBER
(800)428-4950
CALL TWO BUSINESS DAYS BEFORE YOU DIG

INC INLAND NORTHWEST CONSULTANTS
1296 Polston Ave., Ste. B
Post Falls, Idaho 83854
PHONE (208) 773-8370
FAX (208) 777-2128
www.incnorthwest.com

PROFESSIONAL ENGINEER REGISTERED 11138 STATE OF IDAHO DREW C. DITTMAN

ULRICH'S BUENA VISTA UTILITY RECORD DRAWINGS

VISTA BAY, KOOTENAI COUNTY, IDAHO

MARK	DATE	DESCRIPTION
1	10/10/08	AS-BUILTS

ISSUE DATE: 3/11/08
DRAWN BY: AJD/TLT
CHECKED BY: DCD
DWG FILE: *D1
PROJ. # 07-240
SHEET TITLE:
DETAIL SHEET

D2

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Appendix 2-B

IDEQ Sanitary Surveys

THIS PAGE WAS INTENTIONALLY LEFT BLANK

May 19, 2014

Ms Jean Felker,

Department Of Environmental Quality

2110 Ironwood Parkway

Coeur d' Alene, Id. 83814

Subject: Reply to sanitary survey.

Ms. Jean Felker:

Thank you for the results of the sanitary survey done on April 1, 2014.

The dead end lines are flushed every spring. Due to the requirement of needing to be flushed two times per year, I will change our schedule to flushing in the spring and fall.

As to your recommendations, they are being considered.

If you have any questions feel free to call me at 683-3948 or e-mail me at bwsd@frontier.com.

Sincerely,

Neil Peck

System Supervising Operator

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway, Coeur d'Alene, ID 83814 (208) 769-1422

C. L. "Butch" Otter, Governor
Curt A. Fransen, Director

April 29, 2014

Mr. Neil Peck
Bayview Water & Sewer District
PO Box 637
Bayview, ID 83803

Subject: Sanitary Survey of Bayview Water & Sewer District, PWS #1280014

Mr. Peck:

Thank you for your assistance in conducting the sanitary survey of the Bayview Water & Sewer District (BWSD) on April 1, 2014. The water system is in compliance with the Idaho Rules for Public Drinking Water Systems (Idaho Rules).

No significant deficiencies were identified at the time of the survey; however, the following additional deficiencies and requirements must be met. Please submit the requested documents or a plan of correction (POC) for these requirements within 30 days of the receipt of this letter. The POC is a document that should include the deficiencies and additional requirements, how they will be corrected, and the date by which corrections will be completed. Please allow an adequate timeline to implement your POC so that extensions will not be necessary.

Deficiencies and Requirements

1. It is required that any dead end distribution mains must be flushed every six months.

Follow up Items

1. If at any time there is a depressurization event, where distribution pressure is known to have fallen below 20 psi, the BWSD must provide public notification and also notify the Idaho Department of Environmental Quality (DEQ).

Recommendations:

1. It is recommended that all sample taps be smooth nosed.
2. DEQ recommends the reservoir be inspected and cleaned every five years.
3. DEQ recommends the valves in distribution be exercised annually.
4. DEQ recommends an operation and maintenance manual be provided for the drinking water system. Operation and maintenance manuals should include daily operating instructions, trouble shooting, operator safety procedures, location of valves and other key system features, parts lists and parts order forms and information for contacting the water system operator.

If you have any questions regarding this survey, please do not hesitate to contact me at the DEQ in Coeur d'Alene. We are located at 2110 Ironwood Parkway; phone, 208 769-1422.

Sincerely,

Jean Felker

Jean Felker
Drinking Water Analyst
jean.felker@deq.idaho.gov

File in TRIM: ID1280014 (2014ACA2632/2633/2634)

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY
Drinking Water Supply Report
2014

PWS #: 1280014
System: Bayview Water & Sewer District
System Representative: Neil Peck
Surveyed by: Jean Felker, DEQ
Connections: 425 **Population: 1,062**

Date: April 1, 2014
PWS #: 1280014
County: Kootenai

FIELD SURVEY DATA

The Bayview Water & Sewer District (BWSD) serves the residential and commercial areas of the City of Bayview and the Cape Horn Road subdivisions. The water system consists of two drilled wells originally constructed during World War II to serve the Naval Base located at Farragut State Park. The system is also comprised of chlorination treatment, four storage reservoirs and four booster stations.

Source

Well number 7 and 8 were drilled in 1942 while Farragut State Park was a Naval base. Each well is located inside a pumphouse. The wells are each 425 feet deep with a 19-inch casing to 375 feet below ground surface (bgs). The operator indicates that the wells are capable of producing 750 gallons per minute (gpm). The wells are equipped with 125 horsepower (hp) vertical turbine pumps that are controlled by pressure sensors. Well 7 is the main well source and is owned by the BWSD. Well 7 also has a diesel powered auxiliary generator for back-up power supply.

Well 8 is the emergency back-up well source which is leased from Farragut State Park. The sources are manifolded together with well 8 being valved off. Both wells have flow to waste capability and meet all current set back requirements. Diesel powered generator back-up power is provided at pumphouse 7 and at Cape Horn Booster Station.

No existing ground water contamination issues have been identified by the Source Water Assessment report completed June 26, 2001, and updated March 15, 2013. The GWUDI (Ground Water Under Direct Influence of Surface Water) assessment was completed for this single well source on May 1, 1995 and determined that no surface water is influencing the ground water source.

There were no toxic or hazardous materials noted on site at either pumphouse at the time of the survey. The pumphouses and surrounding well lots are fenced and securely locked to prevent unauthorized entry. The pumphouses have adequate heat, lights and ventilation. A source sample tap is located inside of each pumphouse.

Treatment

Disinfection treatment is provided at the Cape Horn Booster Station to serve the Cape Horn area of distribution due to historic coliform bacteria problems within that area. The BWSD uses 12.5% sodium hypochlorite solution. LMI injection pumps are used to inject the solution. The system is flow proportional and cannot inject solution unless the sensor detects flow and has an automatic cutoff in the event the well or reservoir stops producing water.

Storage and Pumping

The BWSD owns four storage reservoirs and four booster stations that serve distribution.

- Reservoir #1 (Farragut Reservoir) is a 225,000 gallon above ground reservoir constructed in 1942. Reservoir #1supplies water to the town of Bayview and to Cape Horn Pumphouse, the newest booster station built in 2003.

- Reservoir #2 (Dromore) is an 11,000 gallon above ground steel tank constructed in 1980, which serves the Dromore subdivision area.

- Reservoir #3 (Pend Oreille Pines) is a 100,000 gallon above ground steel tank constructed in 1990, and serves the Pend Oreille Pines subdivision area.

- Reservoir #4 (Cape Horn Estates) is comprised of two twin, above ground steel reservoirs, each holding a maximum 30,000 gallons each (60,000 gallons total).

All reservoirs were inspected and cleaned in 2005. They reservoirs were all found to be in good condition and well maintained and clean. All have flow to waste capability and are vented. The vents are inspected annually for appropriate and intact screens and maintained as needed.

The pumps at the Cape Horn booster station are two Baldor 40hp centrifugal pumps. Sodium hypochlorite injection for disinfection is done at this location to serve the Cape Horn distribution area. This booster station also has a diesel generator auxiliary power supply.

The Dromore booster station houses the sample tap, meter, and two 3 hp centrifugal pumps.

The Pend Oreille Pines booster station has two 3 hp Baldor VFD pumps.

The Cape Horn Estates booster station that serves the gated community of Cape Horn Estates has one 5 hp centrifugal pump.

Distribution

The distribution system consists of ductile iron, steel and PVC pipe in sizes ranging from 2 inches to 8 inches. Fire hydrants are located throughout the system for flushing and to assist in fire protection.

The BWSD has established a formal cross connection control program. The water system must ensure that cross connections do not exist or are isolated from the potable water system by an approved backflow prevention assembly. Backflow prevention assemblies shall be inspected and tested annually for functionality by an Idaho licensed tester, as specified in Subsection 552.06.c. Annual backflow testing of all backflow assemblies installed on underground sprinkler systems within distribution is required.

Administration

The BWSD is governed by the Water District Board. The financial contact is currently Linda Williams. The operator and administrative contact is Neil Peck. He is currently licensed as DWD1, WWC1, WWT1 and WWTLA and is certified through April 10, 2015 per the Idaho Bureau of Occupational Licensing.

Monitoring

Please refer to the Public Water System Switchboard for current monitoring schedules and other important information located at:
http://www.deq.idaho.gov/water-quality/drinking-water/pws-switchboard.aspx

Well 7 & 8 (manifold):

Alpha/ R226/R228/R6&8 – 1 routine per 9 years
Uranium – 1 routine per 9 years
Fluoride – 1 routine per 9 years
IOCs – 1 routine per 9 years
Sodium – 1 routine per 3 years
VOCs – 1 routine per 6 years
Arsenic – 1 routine per 9 years
Nitrate – 1 per year
Nitrite – 1 per 9 years

Distribution:

Coliform – 2 routine per month
Disinfection By Products (DBP) – 2 routine per year
Lead Copper – 10 routine per 3 years

Please remember to select an additional sample location so you have 10 total sample locations according to the sample site selection criteria. Please have these sites selected prior to the next scheduled round of Lead Copper monitoring. If you do not have enough sites that fit the Lead/Copper sampling site selection criteria, then please select sites throughout distribution to equal the total number of sample sites needed. You can also contact the Idaho Department of Environmental Quality (DEQ) for additional guidance.

Conclusion

At the time of the survey it was evident that Mr. Neil Peck takes his responsibility of providing safe and reliable water to the users of BWSD seriously; his efforts are appreciated by DEQ. The BWSD was found to be in compliance with the Idaho Rules for Public Drinking Water Systems. No significant deficiencies were noted during this sanitary survey.

The deficiencies and recommendations listed below need to be addressed in a written Plan of Correction (POC) and submitted to DEQ within 30 days of the receipt of this letter. The POC is a simple narrative document that lists the deficiencies and additional requirements, how they will be corrected, and the date by which correction will be completed.

Deficiencies and Requirements:

1. It is required that any dead end distribution mains must be flushed every six months.

Follow up Items:

1. If at any time there is a depressurization event, where distribution pressure is known to have fallen below 20 psi, the BWSD must provide public notification and also notify the DEQ.

Recommendations:

1. It is recommended that all sample taps be smooth nosed.
2. DEQ recommends the reservoir be inspected and cleaned every five years.
3. DEQ recommends the valves in distribution be exercised annually.
4. DEQ recommends an operation and maintenance manual be provided for the drinking water system. Operation and maintenance manuals should include daily operating instructions, trouble shooting, operator safety procedures, location of valves and other key system features, parts lists and parts order forms and information for contacting the water system operator.

Photographic Documentation

Name of Facility: BAYVIEW WATER & SEWER DISTRICT

Inspector: J. FELKER

Inspection Date: Tuesday, April 01, 2014

Purpose of Inspection: SANITARY SURVEY

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

Publish Date: Tuesday 29 April 2014

Table of Photographs:


Photograph 1: Dromore Booster Station


Photograph 2: Dromore Booster Vault


Photograph 3: Dromore Reservoir


Photograph 4: Farragut Reservoir

Photograph 5: Pump house for Well 8

Photograph 6: Well 8

Photograph 7: Cape Horn Booster Station

Photograph 8: Cape Horn Emergency Power Generator

Photograph 9: Cape Horn Power Controls

Photograph 10: Cape Horn Booster Pumps

Photograph 11: Sodium Hypochlorite solution tank and LMI meter

Photograph 12: Injection site for Cape Horn distribution

Photograph 13: Pend Orielle Pines Booster Station

Photograph 14: Pend Orielle Pines booster pumps

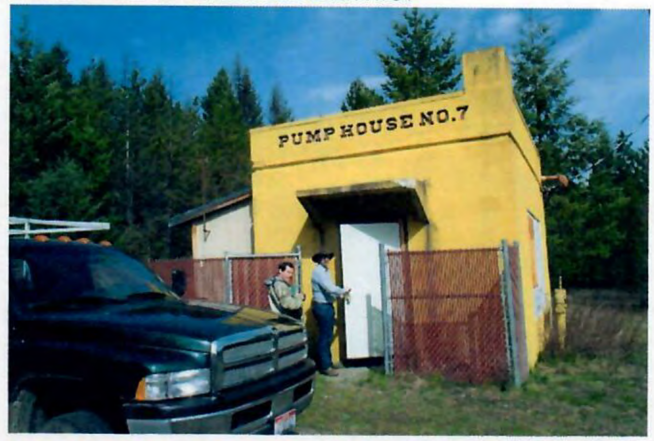
Photograph 15: Pend Orielle Pines Reservoir

Photograph 16: Cape Horn Estates Booster station

Photograph 17: Cape Horn Estates Booster vault

Photograph 18: Cape Horn Estates Reservoir

Photograph 19: Cape Horn Estates Reservoir valves



Photograph 20: Pump house for Well 7

Photograph 21: Well 7 - primary well

Enhanced Sanitary Survey
Instructions for Selection of Correction Time Frame

☐ **24 hours**

This time frame should be selected for those items that pose an Imminent Threat to Public Health and must be remedied as soon as possible to decrease exposure to dangerous or potentially dangerous contamination or circumstances.

These items would be considered to be Health Hazards that would create or may create a danger to the consumer's health. These hazards may consist of but are not limited to, design, construction, operational, structural, collection, storage, distribution, monitoring, treatment, or water quality elements of a public water system.

This time frame should be selected for those items identified that are Significant Deficiencies and that we determine to cause or have potential to cause, risk to health or safety or that could affect the reliable delivery of safe drinking water.

(It is anticipated that relatively few items, and only those of the highest priority, will be identified that will require remedy within this Correction Time Frame.)

☐ **7 Days**

These items would be considered to be Health Hazards that would create or may create a danger to the consumer's health. These hazards may consist of but are not limited to, design, construction, operational, structural, collection, storage, distribution, monitoring, treatment, or water quality elements of a public water system.

This time frame should be selected for those items identified that are Significant Deficiencies and that we determine to cause or have potential to cause, risk to health or safety or that could affect the reliable delivery of safe drinking water.

☐ **Complete Report of Survey Results Within Thirty Days**

A report describing the complete results of this survey will be provided within thirty days. After receipt of this report, you have 30 days to consult with the regulatory agency regarding a schedule for completing any corrective actions required in response to the survey.

(It is anticipated that the majority of the items identified during the inspection will require corrective action within 120 days following consultation with the regulatory agency. Factors that could be considered when selecting this time frame would be overall risk or potential risk to public health, expertise necessary to effectively make the modification (plumbing, electrician, engineering) and expense of the modification (large capital improvement vs. replacement of item from operating budget.)

DISCLAIMER: This document is a Preliminary Inspection Findings Form. It does not constitute a final determination of compliance status with any of the laws administered by the Idaho Department of Environmental Quality, including, but not limited to, the Idaho Environmental Protection and Health Act, Idaho Code § 39-101, et seq., the Idaho Rules for Public Drinking Water Systems, IDAPA 58.01.08, and adoptions of Federal Regulations thereunder, Idaho Code § 50-1326 et seq., Idaho Code § 54-2401 et seq., or any rules promulgated, permits issued, or consent or judicial orders entered into under authority of these acts. The Idaho Department of Environmental Quality reserves the right to supplement this document with additional compliance determinations, and amend, change, or otherwise modify any determination stated in this document. This document in does not restrict or preclude the State of Idaho or the Department of Environmental Quality from taking action available under law to address past, present, or future violations of the laws administered by the agency.

Enhanced Sanitary Survey
Preliminary Inspection Findings Form

Facility Name: Bayview Wts District PWS #: 1280014

Inspection Date: 4-1-2014 Time Closing Conference Begins: ________ Time Closing Conference Ends: ________

Inspector: Jean Felker Phone #: ________
(Print Name)

Inspector: Jeanfelker
(Signature)

Facility Representative: Neil Peck E-mail: ________
(Print Name)

Title: ________ Facility Representative: Neil Peck
(Signature)

Note: *Your signature indicates you have received this document and does not imply agreement with the violations noted.*

Significant Deficiencies Noted at the Time of the Inspection:
In accordance with IDAPA 58.01.08.008.02., the health hazards identified below must be mitigated as required by the Department and terminated within a time schedule established by the Department.

	Correction Time Frame
1.	☐ 24 hours ☐ 7 days ☐ Corrective action plan within 30 days
2. none noted	☐ 24 hours ☐ 7 days ☐ Corrective action plan within 30 days
3.	☐ 24 hours ☐ 7 days ☐ Corrective action plan within 30 days
4.	☐ 24 hours ☐ 7days ☐ Corrective action plan within 30 days
5.	☐ 24 hours ☐ 7 days ☐ Corrective action plan within 30 days
6.	☐ 24 hours ☐ 7 days ☐ Corrective action plan within 30 days

Potential Violations Pending Further Review:

1.
2. none
3.
4.
5.
6.

Free Technical Assistance: Yes ☐ No ☐

- ☐ Financial: a) rate reviews b) budgeting c) finding loans and grants d) capital improvement planning
- ☐ Training: a) operator b) board/council c) asset management d) developing policies and procedures
- ☐ Technical Assistance: a) leak detection b) line location c) distribution d) treatment e) other
- ☐ System Operation: a) best practices guidance b) emergency response c) vulnerability assessment
- ☐ Source Water Protection: a) planning b) implementation

Contact Name: ________ phone #: ________

Original stays with inspector for scanning and registration into TRIM. Copy stays with Public Water System Owner/Operator.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway, Coeur d'Alene, ID 83814 (208) 769-1422

Brad Little, Governor
John H. Tippets, Director

April 11, 2019

Sharon Meyer, Administrative Contact
Robert Kuchenski, Designated Operator in Charge
Bayview Water and Sewer District
PO Box 637
Bayview, ID 83803
BWSD637@gmail.com
bob@integritywater.net

Subject: Report of Sanitary Survey, Bayview Water and Sewer District, ID1280014

Sharon and Bob:

Thank you for your system participation during the survey of the Bayview Water and Sewer District on March 26, 2019. The water system was inspected and determined to be operating in partial compliance with the Idaho Rules for Public Drinking Water Systems (Rules). The system will be considered operating in full compliance with the Rules at the time the significant deficiencies and deficiencies are corrected.

Within 30 days of receipt of this survey, the system is required to provide a written plan describing how and on what schedule the system will address the significant deficiencies listed at the conclusion of the enclosed report.

Please complete and return the enclosed financial form prior to May 31, 2019.

I may be reached at 208-666-4624 with any questions or concerns you may have pertaining to the survey.

Sincerely,

Suzanne Scheidt

Suzanne Scheidt
Senior Drinking Water Analyst
suzanne.scheidt@deq.idaho.gov

Enclosures: Bayview Water and Sewer District Report and Photo Log, Financial Form

c: Anna Moody, Drinking Water Program Supervisor anna.moody@deq.idaho.gov
Jean Felker, Drinking Water Analyst jean.felker@deq.idaho.gov
File in TRIM: ID1280014: 2019ACA2721

2019 Drinking Water Supply Report
Idaho Department of Environmental Quality

System: Bayview Water and Sewer District
PWS#: ID1280014 **County:** Kootenai **Date of Survey:** March 26, 2019
System Representatives Present at Survey: Bob Kuchenski
Surveyed by: Suzanne Scheidt, Senior Drinking Water Analyst
Sources: Wells 7 & 8
Water System Type: Community
Population: 1,162 **Service Connections:** 465 residential and commercial

A photographic log is enclosed with the narrative report.

System Overview

The Bayview Water and Sewer District (District) is a community public drinking water system (system) supplied by two wells drawing from the Rathdrum Prairie Aquifer. The system supplies five pressure zones via reservoirs and booster stations. A map of key system components, pressure zones and service areas is included at the conclusion of this report.

Wells are equipped with manual switch-over diesel generators, and most booster stations are equipped with propane generators with auto-switchover. The system maintains a one-way emergency intertie from neighboring Farragut State Park.

Voluntary chlorination of Cape Horn distribution components is provided via flow proportional injection at the Limekiln booster station.

Remote monitoring of central systems components is provided via supervisory control and data acquisition (SCADA). SCADA programming sends autodialer alarms to operators and District office staff in the event of system conditions such as well 7 and 8 failure to start, power loss, booster pump failure to start and communication failure. Battery back-up power to SCADA components is provided at well 7, Farragut tank, and the District office.

Source Water Assessment Reports for wells 7 and 8 may be reviewed and updated at:
http://www2.deq.idaho.gov/water/swaOnline/Search

Sources

Wells 7 and 8 were drilled with similar construction characteristics in the 1940s to supply the Farragut Naval Base. Wells are cited 1900 feet apart and individually discharge to a common 10-inch transmission main sized to accept combined well discharge to the Farragut tank. Well 7, the 10-inch transmission main and the Farragut tank were acquired by the District from the U.S. Navy in the 1970s under a 50-year lease. Well 8 was acquired by the District from the State of Idaho in the 1990s (the State of Idaho had previously acquired remaining original land and Farragut Naval infrastructure in the 1950s). The District operates and maintains well 8 under a 10-year permit requiring renewal in 2024.

Required setback distances between wells and potential sources of contamination are met. Well pedestals were found to be sealed, and well vent casings protected with 24-mesh screens.

Well discharge appurtenances include: raw water sample tap, flow meter, check valve, and isolation (gate valves). Flow meters installed on well 7 and 8 discharge are past due for calibration and evaluated as a deficiency requiring correction. Pressure relief valves are not installed on well discharge and evaluated as deficiencies requiring correction. Wells are not equipped with flow to waste; this is evaluated as a deficiency requiring correction at the time of next material modification.

Operation of wells 7 and 8 was recently modified to alternating lead/lag. Prior to this operational modification, well 7 serves as primary with well 8 as emergency back-up. Monitoring requirements have been updated to reflect this operational change.

As indicated, wells discharge via 10-inch transmission main to supply the Farragut tank. Torpedo casings were likely installed in conjunction with well construction to tamper pressure transients to the 10-inch main and reduce entrained air during well cycles. It is strongly recommended the efficacy of this configuration be further evaluated to determine if additional measures are required to minimize future impacts to transmission main between wells and Farragut tank.

Injection quills are installed on individual well discharge for emergency chlorination purposes if necessary. A 30 gallon day tank (empty) and electronic metering pump are housed within the well 7 building.

The Idaho Department of Water Resources issued a water right (95-9880) of 4.38 cfs for well 7 with a priority date of 7/17/1981 and a water right (95-9880) of 1.7 cfs for well 8.

Well 7 (E0005327)

As per available records, well 7 was constructed in the early 1940s to an approximate depth of 330 feet below ground surface. The "extra heavy wall oil well" 18-inch casing (0.875-inch wall thickness) was perforated at the bottom 67 feet. Static water level was reported at 223 feet bgs. Records reflect lithology below the static water level to consist of sands and gravels. It is unknown if the well was constructed with a surface seal. The well is enclosed in a building; entry is secured by a locked gate.

The vertical turbine line shaft well is equipped with a 125-hp soft start motor reported to have been re-built within the last 10 years. The pump lifts via an 8-inch pump column discharging at approximately 750 gpm. Water lube is provided via consistent distribution back-pressure routed through a flow restrictor. In the event flow is not detected, the primary logic controller will preclude the pump from energizing and an autodialer alarm sent to the operator via SCADA relay.

Well 8 (E0005328)

System records reflect well 8 was also constructed in the early 1940s. Well-specific construction documents are not available; however, it is assumed well 8 was similarly constructed to well 7. It is unknown if the well was constructed with a surface seal. The well is enclosed within a locked building.

The vertical turbine (oil-lubed NSF-H1 Chevron Food Grade 21) line shaft well is equipped with a 125-hp soft start motor also reported to have been re-built within the last 10 years. The pump lifts via an 8-inch pump column discharging at approximately 750 gpm.

The operator reported a minimum forty-five minute pre-lube period is required when well 8 is not routinely actuated. When routinely operated, pre-lube period is reduced to five minutes.

Distribution System

Distribution Main

Distribution main is constructed primarily of 6-inch PVC with some sections of 2-inch, 4-inch, and 8-inch diameter PVC or polyethylene pipelines. Sections of 8-inch cast iron are located within the vicinity of the naval facility; while sections of 5-inch steel line supply portions of Cape Horn Estates distribution zone. The Facility Plan indicates some sections of 2-inch main between lengths of larger diameter main create bottlenecks in distribution capacity.

The District has conducted in-depth review of non-revenue water and determined an estimated 50% loss. The current percentage of loss exceeds industry standard recommendations by 40%. Three potential causes have been identified as contributors:

1. Recent studies as reported in the 2018 Facility Plan reflect a high probability significant leakage of aging 10-inch transmission main between wells and the Farragut tank. This is evaluated as significant deficiency of Idaho Rules for Public Drinking Water Systems, IDAPA 58.01.08.542.10. A plan of correction for addressing this issue is required within 30 days of receipt of this report.
2. Many service meters are 40 years old, beyond their useful life and likely under-reporting. It is strongly recommended service meters be repaired or replaced to accurately measure non-revenue water in order to maintain financial resiliency of the system.
3. The US Navy Detachment facility is supplied via one 6-inch and two 8-inch unmetered connections. The facility is charged $600 per month for water and wastewater services. It is strongly recommended meters are installed at the facility to ensure the facility is adequately charged for metered usage.

Hydraulic modeling analyses indicate 40 psi maximum day demand cannot be met throughout distribution with specific pressure decreases observed in the Dromore distribution zone. This is evaluated as a deficiency requiring further evaluation and correction if necessary.

As per the system operator, all non-looped main segments terminate at service connections.

Pressure reducing valves (PRV) installed on distribution main are protected from freezing. A lack of routine servicing of PRVs presents a concern for unreliable operation and evaluated as a deficiency of the Rules requiring corrective action.

The operator is not aware of any air vacuum relief valves (AVR) installed on distribution main. In the event an AVR is located, the outlet is required to be raised above the ground water table, downturned and equipped with 24-mesh screen.

Fire Flow Requirements

Fire flow is established by the Timberlake Fire Protection District. Minimum fire flow requirements for one and two family dwellings (less than 3600 square feet) are 1000 gpm for 60 minutes. Fire flow requirements for other buildings are based on building area and construction type with minimum flow of 1500 gpm for prescribed duration. As reported in the 2018 Facility Plan, Chief Steele with Timberlake Fire Protection District indicated there is "always room for improvement but there are generally no glaring inadequacies on existing conditions for residential areas, with the exception of the inadequate 11,000 gallon tank in the Dromore area." The lack of adequate fire flow to the Dromore distribution zone is evaluated as a deficiency requiring corrective action.

Chief Steele also indicated the Fire District would prefer to see the following fire flows and duration be addressed in future water system improvements:

- Residential Areas (single family homes up to 3,600 SF): minimum fire flows of 1,000 gpm for one hour.
- Larger Residential/Commercial Areas: minimum fire flows of 1,500 gpm for two hours.

Fire hydrants within the Naval Detachment are not supplied by District infrastructure.

Emergency Intertie

A one-way intertie between Farragut State Park and the District may be utilized to supply the Bayview system on an emergency temporary basis. As the District operates at a lower main pressure, Farragut does not receive service from the intertie. While the two systems have been separated by a single gate valve since original Naval Base construction, in 2000 an electrically actuated solenoid valve was installed. Valve controls are housed in the well 8 building.

Pressure Zones

The District supplies three pressure zones within the Bayview area and two pressure zones within the Cape Horn Area.

Gravity Pressure Zone – Bayview Zone 1. This zone supplies approximately 40 connections via 4-inch and 6-inch main within in the southwest service boundary of the district via gravity from the Farragut tank. Distribution main pressures range from 70 to 100 psi.

Bayview Zone 2 – This zone is also supplied via gravity from the Farragut tank; however as services are at a lower elevation, water is first routed through a PRV. Distribution main is predominantly 4-inch and 6-inch with some segments of 8-inch main. Distribution main pressures range from 45 to 90 psi.

Dromore Zone – This zone supplies approximately 20 residential connections through 2-inch, 3-inch, 4-inch and 6-inch main; main pressure ranges from 25 to 70 psi. Boosted pressure is provided via Dromore booster station; the 11,000 gallon Dromore tank rides on the zone.

Cape Horn Zone 1 – This zone is supplied by boosted pressure via the Limekiln booster station through 6-inch and 8-inch mains constructed in 2002. Some original Cape Horn services are supplied via 2-inch, 4-inch and 5-inch steel mains. The 100,000 gallon Pend Oreille Pines tank rides on the zone. Pressure range from 45 to 120 psi with individual PRVs installed on service connections receiving pressures greater than 80 psi.

Pend Oreille Boosted Zone – this zone receives boosted pressure from the Pend Oreille Pines booster station drawing from the 100,000 gallon Pend Oreille Pines tank.

Upper Cape Horn Estates Zone 2 – This zone receives boosted pressure from Cape Horn booster station via 6-inch main constructed in 1973. The two 30,000 gallon Cape Horn Estates tanks ride on the zone. Pressure range from 50 to 70 psi. The zone is separated by Cape Horn Zone 1 by two PRVs set to open in the event of emergency to provide fire flow to Cape Horn Zone 1.

Farragut Tank

As indicated, wells 7 and 8 discharge via 10-inch designated transmission main to supply the 225,000 gallon concrete Farragut tank constructed to supply the Naval base in the 1940s. The tank was constructed with an elevated floor accessed via internal stair case.

The tank was cleaned and inspected by Aquadrone through deployment of a remote operated vehicle in November 2017. Inspection results indicated "widespread and significant failure in the coating on walls, floor and interior supports."

Structural engineering evaluation completed in December 2017 indicated numerous cracks subject to leaks and posing damage to steel structural supports. Failure of coating and internal supports as well as numerous cracks and leaks are evaluated as a deficiency requiring corrective actions. Video supplied by Aquadrone inspection indicates the reservoir roof access hatch is not equipped with a water tight seal, and is evaluated as a significant deficiency requiring correction. Video does not include reservoir vent condition or adequate seals of roof control junction box, please provide photo-documentation of these items prior to May 31, 2019. The location of the overflow outlet is not known; and evaluated as a significant deficiency. The overflow is required to be located and if necessary modified to allow for the outlet to discharge to day light and equipped with a 4-mesh expandable mesh screen with weighted flapper or 24-mesh screen.

A level transducer with back-up pressure transducer are installed within the tank and tied to SCADA relay to actuate well pumps. A SCADA radio receiver installed on the tank communicates via relay with wells 7 and 8, Limekiln and Pend Oreille Pines booster stations, and Cape Horn Estates tank.

The reservoir may not be taken off line without subjecting the Bayview distribution zones to an unacceptable decrease in pressure.

Due to the apparent shared inflow/outflow piping configuration of the tank, there is a higher likelihood for stagnant water concerns in the tank. It is recommended this is considered when evaluating operational level set points.

Limekiln Booster Station

The Limekiln booster station provides initial boosted pressure from the Bayview lower gravity zone to Cape Horn, Pend Oreille and Upper Cape Horn pressure zones. Two 40-hp pumps discharging at 350 gpm each supply boosted pressure to 8-inch HDPE main. The 8-inch main is routed approximately 1 ½ miles along lake depth adjacent to the shoreline. The submerged main was inspected via Aquadrone in 2017 and found to be in good condition.

Pumps are equipped with upstream and downstream isolation valves. Pressure gages are provided on manifold of pump inlets and outlets. An instantaneous and totalizing flow meter is installed on boosted discharge. A pressure relief valve is not provided on boosted discharge and evaluated as a deficiency requiring corrective action.

Remote operation and oversight of the PLC is provided via SCADA relay with back-up battery power. SCADA is programmed to provide auto-dialer alarms to the operator in the event of low/high pressures, power loss, etc. The booster station is equipped with back-up power via propane generator with automatic switchover.

The locked booster station is equipped with adequate heat, ventilation and floor drain.

Sodium hypochlorite injection is provided to boosted discharge via a flow proportional electronic metering pump drawing from a sodium hypochlorite day tank. The metering pump is paced via instantaneous flow meter signal provided through the PLC. The 30 gallon day tank is equipped with secondary containment.

Dromore Tank

The Dromore 11,000 gallon welded steel tank was constructed in late 1970's - early 1980's and gravity supplies 20 homes in the northeast portion of Bayview. The tank rides on the Dromore boosted pressure zone.

The tank was inaccessible at the time of the survey. The 2018 Facility Plan indicates float controls are assumed to be installed in the tank to actuate the Dromore booster pumps in alternating lead/lag. The plan also states there are taste complaints in the Dromore zone with customer reports of black flakes. An above grade discharge pipe is wrapped in insulation;

however, reportedly susceptible to freezing.

Photo-documentation of the adequately protected overflow outlet, screened vent and access hatches equipped with internal seals must be provided to DEQ prior to May 31, 2019.

Dromore Booster Station

The Dromore booster station is located adjacent to supply the Dromore tank. Two 3-hp pumps discharging at 50 gpm each are equipped with upstream and downstream isolation valves. A sample tap is provided on boosted discharge.

A pressure gage is provided on the suction line; an additional gage is required on boosted discharge. A pressure relief valve is required to be installed on the boosted discharge and evaluated as a deficiency.

The locked booster station is equipped with adequate heat, ventilation and floor drain. The station is not equipped with back-up power as recommended.

Pend Oreille Pines Tank

The Pend Oreille Pines 100,000 gallon welded steel tank was constructed in 2002 in conjunction with the project to extend service to Cape Horn. The tank rides on the Limekiln booster station, a level transducer in the tank actuates booster pumps (equipped with VFDs) via SCADA relay.

A level transducer installed in the standpipe provides remote SCADA monitoring.

The tank combined internal overflow and drain outlet is protected with 24-mesh screen and discharges via air gap to an armored bank. The reservoir is equipped with a vent protected with 24-mesh screen. The reservoir roof was not accessible at the time of the survey, photo-documentation of internal access hatches must be provided by May 31, 2019.

Pend Oreille Pines Booster Station

The Pend Oreille Pines booster station shares a property with the Pend Oreille Pines tank. The station provides boosted pressure to 20 lots (13 homes) via two 3-hp pump (capacity 27 gpm each) equipped with variable frequency drive (VFD) motors. Remote operation and oversight is provided via SCADA relay. Pumps are equipped with upstream and downstream isolation valves.

Pressure gages are provided on manifold of pump inlets and outlets. A pressure relief valve is required on boosted discharge tee where a pressure reducing valve is not installed and evaluated as a deficiency. One hydropneumatic tank rides on boosted pressure; the tank bladder appears to have failed and will require additional evaluation. Should tank bladder failure be confirmed, the deficiency must be corrected.

The locked booster station is equipped with adequate heat, ventilation and a floor drain.

Booster pump components receive back-up power via propane generator with automatic switch over.

Cape Horn Estates Tanks

Two identical 30,000 gallon welded steel tanks were constructed in early 1970s with original development of Cape Horn Estates. Tank interiors were re-coated and exteriors repainted in 2002. Tanks receive boosted pressure via the Cape Horn booster station and ride on the Upper Cape Horn Boosted Zone to supply approximately 20 residential connections within the northeast boundary of the system's service area.

A level transducer installed in the standpipe provides remote SCADA oversight and operation.

Tanks are equipped with isolation valves and may be taken off line individually without discontinuing service to Cape Horn customers.

Individual standpipe combined vents and overflows are adequately air gapped and equipped with 24-mesh screen. The reservoir roof was reportedly in good condition and an internal water tight seal was provided. Please provide photo-documentation of the internal water tight access hatch prior to May 31, 2019.

Cape Horn Booster Station

The Cape Horn booster station provides boosted pressure to the upper Cape Horn Zone via one 5 hp pump equipped with upstream and downstream isolation valves. The pump is actuated via pressure transducer on boosted pressure. The booster station is not equipped with a duplex pump; however the upper zone may be supplied via gravity from the Cape Horn tanks.

Pressure gages are provided on pump suction and discharge. A pressure relief valve is required on boosted pressure discharge and evaluated as a deficiency. The station is equipped with a floor drain. The locked booster station is provided with adequate heat and ventilation. Booster station components are equipped with back-up power via propane generator with auto-switchover.

Cross Connection Control Implementation

As per Idaho Rules, the water system purveyor is responsible for implementation of a Cross Connection Control Program. The water system purveyor is defined as "the person, company, or association who provides or intends to provide drinking water to the customers and is ultimately responsible for the public water system operation." The District Board is considered the purveyor ultimately responsible for implementation of the program.

The following Rule citation (IDAPA 58.01.08.552.06.a-e) lists the minimum requirements of a Cross Connection Control Program:

Cross Connection Control Program - Community Water Systems. The water purveyor is responsible through its cross connection control program to take reasonable and prudent *measures to protect the water system against contamination and pollution from cross connections through premises isolation, internal or in-plant isolation, fixture protection, or some combination of premises isolation, internal isolation, and fixture protection. Pursuant to Section 543, all suppliers of water for community water systems shall implement a cross connection control program to prevent the entrance to the system of materials known to be toxic or hazardous. The water purveyor is responsible to enforce the systems cross connection control program. The program will at a minimum include:*

1. *An inspection program to locate cross connections and determine required suitable protection. For new connections, suitable protection must be installed prior to providing water service.*
2. *Required installation and operation of adequate backflow prevention assemblies. Appropriate and adequate backflow prevention assembly types for various facilities, fixtures, equipment, and uses of water should be selected from the AWWA Pacific Northwest Section Cross Connection Control Manual, the Uniform Plumbing Code, the AWWA Recommended Practice for Backflow Prevention and Cross Connection Control (M14), the USC Foundation Manual of Cross Connection Control, or other sources deemed acceptable by the Department. The assemblies must meet the requirements of Section 543 and comply with local ordinances.*
3. *Annual inspections and testing of all installed backflow prevention assemblies by a tester licensed by a licensing authority recognized by the Department. Testing shall be done in accordance with the test procedures published by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research. See the USC Foundation Manual of Cross-Connection Control referenced in Subsection 002.02.*
4. *Discontinuance of service to any structure, facility, or premises where suitable backflow protection has not been provided for a cross connection.*
5. *Assemblies that cannot pass annual tests or those found to be defective shall be repaired, replaced, or isolated within ten (10) business days. If the failed assembly cannot be repaired, replaced, or isolated within ten (10) business days, water service to the failed assembly shall be discontinued.*

The District has established a Cross Connection Control Ordinance; however a cross connection control program is not fully implemented. This is evaluated as a deficiency of the Rules requiring correction.

Monitoring Summary

The system is in compliance with all current monitoring requirements. The District actively participates in DEQ's Monitoring Waiver Program. The table on page 10 summarizes current monitoring requirements. The monitoring schedule may also be accessed at: http://www. deq.idaho.gov/water-quality/drinking-water/pws-switchboard. aspx

Sample Type	Frequency	Sample Location
Distribution		
Total coliform	2 samples per month	In accordance with coliform sampling plan
Lead and Copper	10 samples every 3 years	Assigned sampling locations
Total Trihalomethane	1 sample every year	Cape Horn Estates Tower
Haloacetic Acids Group 5	1 sample every year	Cape Horn Estates Tower
Sample Location: Well 7	**Frequency**	
Nitrate	1 sample per year	
Nitrite	1 sample per 9 years	
Alpha	1 sample per 9 years	
Fluoride	1 sample per 9 years	
Sodium	1 sample per 3 years	
Uranium	1 sample per 9 years	
VOCs	1 sample per 6 years	
Arsenic	1 sample per 9 years	
Radium 226	1 sample per 9 years	
Radium 228	1 sample per 9 years	
Regulated IOC	1 sample per 9 years	
Sample Location: Well 8	**Frequency**	
Nitrate	1 sample per year	
Nitrite	1 sample per 9 years	
Alpha	1 sample per 9 years	
Fluoride	1 sample per 9 years	
Sodium	1 sample per 3 years	
Uranium	1 sample per 9 years	
VOCs	1 sample per 6 years	
Arsenic	1 sample per 9 years	
Radium 226	1 sample per 9 years	
Radium 228	1 sample per 9 years	
Regulated IOC	1 sample per 9 years	

Source Water Quality

Source water quality meets all regulatory standards. Nitrate levels (1995-present) range consistently between minimum detection limits to 0.2 mg/L from the historical manifold sampling location. The maximum contaminant level (MCL) for nitrate in drinking water is 10 mg/L. Arsenic levels (2001-2017) consistently range below minimum detection limits to 0.004 mg/L from samples drawn from the manifold sampling location. The MCL for arsenic in drinking water is 0.010 mg/L.

Distribution Water Quality

Disinfection by product results drawn from the Cape Horn Estates Tower in September 2018 were below minimum laboratory detection limits for haloacetic acid group 5. Total trihalomethane results were 4.35 ug/L; the MCL for total trihalomethanes in drinking water is 80.0 ug/L. Results are indicative of low organic compounds in the source supplies.

Lead and copper monitoring results from the most recent round of ten samples collected in August 2016 indicate levels of lead in the drinking water supply range between 0.0013 to 0.0026 mg/L. The action level for lead in drinking water is 0.015 mg/L. Copper levels ranged from 0.0159 mg/L to 0.0473 mg/L. The action level for copper in drinking water is 1.3 mg/L.

The District is required to collect two coliform samples per month from rotating locations throughout the distribution system. Please provide a copy of the system's total coliform sampling plan.

Operator Certification

The Bayview Water and Sewer District is classified as a distribution one water system and is under designated oversight of Responsible Charge Operator Robert Kuchenski. Mr. Kuchenski holds a Distribution Level 2 (DWD2-14719) and Treatment Level 2 (DWT1-10956) license, renewal due February 2020. Ian Kuchenski serves as the back-up operator and holds a Distribution Level 1 (DWD1-21471) license, renewal due July 2019. As per Idaho Statute, the licensed operator is responsible for all decisions impacting water quality or quantity.

Administration

The District is administered by a five member Board meeting at the District Office. Sharon Meyer serves as Chairwoman, Robyn Edwards as Vice-Chair, Jan Jones, Rich Doney, and Steve May serve as Directors.

Rate Structure

All District service connections are metered. System rate structure was last updated in February 2018 and included as an addendum to the survey report.

Conclusion

The system was found to be operating in partial compliance with the Idaho Rules for Public Drinking Water Systems and will be considered to be operating in full compliance with the Rules upon correction of significant deficiencies and deficiencies noted below.

Significant Deficiencies – A corrective action plan, which includes a schedule for implementation of corrections, is required to be submitted within 30 days of receipt of this report.

1. Recent studies reported in the 2018 Facility Plan indicate a high probability of significant leakage within aging 10-inch transmission main between wells and Farragut tank and is evaluated as significant deficiency as per IDAPA 58.01.08.542.10.
2. The location of the Farragut tank overflow outlet is not known and is evaluated as a significant deficiency. The overflow is required to be located and if necessary modified to allow for the outlet to discharge to day light and be equipped with a 4-mesh expandable mesh screen with weighted flapper or 24-mesh screen as per IDAPA 58.01.08.546.03.
3. The Farragut tank access hatch is not equipped with a water tight gasket as per IDAPA 58.01.08.544.03.

Deficiencies - Please provide a description and timeline for addressing deficiencies in the written plan of correction.

1. Flow meters installed on well 7 and 8 discharge are past due for calibration.
2. Wells are not equipped with flow to waste and require correction at the time of next material modification.
3. Pressure relief valves are not installed on well discharge.
4. Inadequate pressure (static pressure less than 20 psi) within the Dromore distribution zone is evaluated as a deficiency requiring correction.
5. A lack of routine servicing of PRVs presents a concern for unreliable operation and requires corrective action.
6. The lack of adequate fire flow to the Dromore distribution zone requires corrective action.
7. Failure of Farragut tank coating and internal supports as well as numerous cracks and leaks requires corrective actions.
8. A pressure relief valve is required to be installed on Limekiln, Cape Horn, and Dromore boosted discharge.
9. A pressure relief valve is required on Pend Oreille Pines boosted discharge tee not already equipped with a PRV.
10. The District has established a Cross Connection Control Ordinance; however a cross connection control program is not fully implemented. This is evaluated as a deficiency of the Rules requiring correction.

Additional Requirements

1. Please provide photo-documentation of Farragut tank vent condition and seals on roof control junction box prior to May 31, 2019.
2. Dromore tank Photo-documentation of the adequately protected overflow outlet, screened vent and access hatches equipped with internal seals must be provided to DEQ prior to May 31, 2019.
3. Photo-documentation of Cape Horn tank and Pend Oreille Pines tank internal access hatches must be provided by May 31, 2019.
4. A follow up meeting will be scheduled with Jessie Roe prior to May 31, 2019 to evaluate current implementation of the cross connection control program. A timeline for implementation of the program will be updated based on information presented.
5. Please confirm that all booster pumps are equipped with low flow cut off mechanisms.
6. Upon discovery, AVR outlets are required to be raised above the ground water table, down turned and equipped with 24-mesh screen.
7. Please provide an updated copy of the system's total coliform sampling plan with the plan of correction.

Recommendations

1. Wells discharge via 10-inch transmission main to the Farragut tank. At the time of well construction, torpedo casings were likely installed to tamper pressure transients and alleviate entrained air during well cycles. It is strongly recommended the efficacy of this configuration be further evaluated to determine if additional measures are required to minimize future impacts to transmission main between wells and Farragut tank.
2. It is strongly recommended service meters are repaired or replaced in order to maintain

financial resiliency of the system.

3. It is strongly recommended that meters are installed at US Naval Detachment facility to measure water usage and ensure the facility is appropriately changed for usage.
4. It is recommended the potential for stagnant water be considered when determining operational level set points of the Farragut tank.
5. It is recommended the Dromore booster station be equipped with auto transfer back-up power.

Photographic Documentation

Name of Facility: Bayview Water and Sewer District

Inspector(s): Suzanne Scheidt

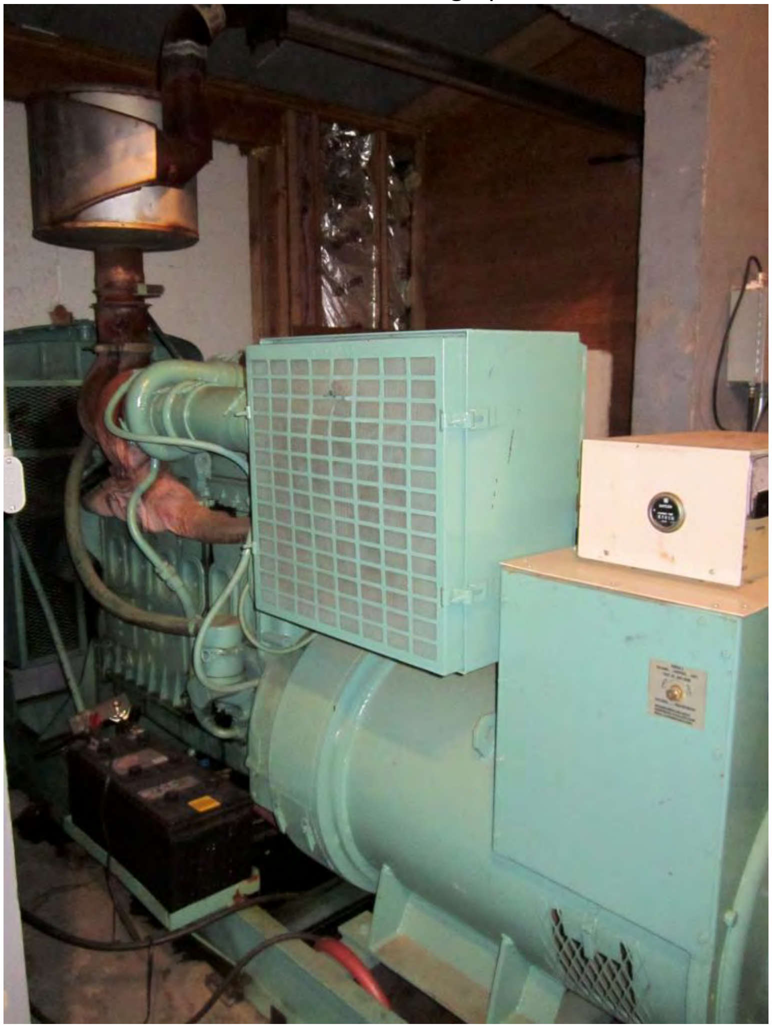
Inspection Date: Tuesday, March 26, 2019

Purpose of Inspection: Sanitary Survey

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

Publish Date: Wednesday 3 April 2019

Table of Photographs:

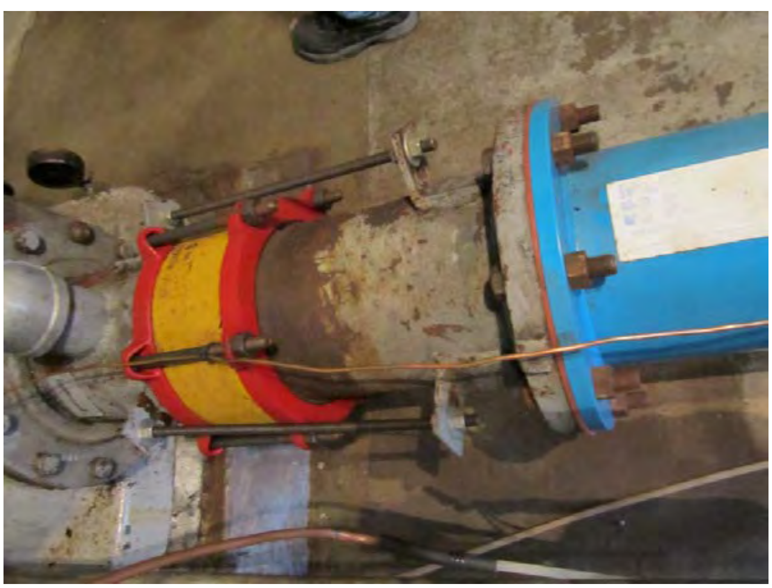


Photograph 1: Well 7 diesel manual switchover generator

Photograph 2: Well 7 diesel manual switchover generator

Photograph 3: Well 7 water lubed VTLS

Photograph 4: Well 7 screened casing vent



Photograph 5: Well 7 discharge appurtenances

Photograph 6: Well 7 discharge appurtenances

Photograph 7: Well 7 air/pressure release (torpedo casing)

Photograph 8: Well 7 air/pressure relief (torpedo casing)

Photograph 9: Well 7 pressure gage

Photograph 10: Well 7 emergency chlorination components

Photograph 11: Well 7 PLC tied to SCADA relay

Photograph 12: Well 7 diesel fuel tank w/ secondary containment

Photograph 13: Well 7 building

Photograph 14: Well 8

Photograph 15: Well 8 controls

Photograph 16: Well 8 discharge appurtenances

Photograph 17: Well 8 food grade oil

Photograph 18: Well 8 discharge appurtenances

Photograph 19: Well 8 torpedo casing pressure/air release

Photograph 20: Well 8 discharge appurtenances

Photograph 21: Well 8 discharge appurtenances

Photograph 22: Well 8 building

Photograph 23: Farragut Tank

Photograph 24: Farragut Tank internal stairway access

Photograph 25: Farragut Tank shared inflow/outflow

Photograph 26: Farragut Tank overflow

Photograph 27: Farragut Tank overflow

Photograph 28: Farragut Tank shared inflow/outflow

Photograph 29: Farragut Tank isolation valves

Photograph 30: Farragut Tank shared inflow/outflow isolation valves

Photograph 31: Farragut Tank shared inflow/outflow isolation valves

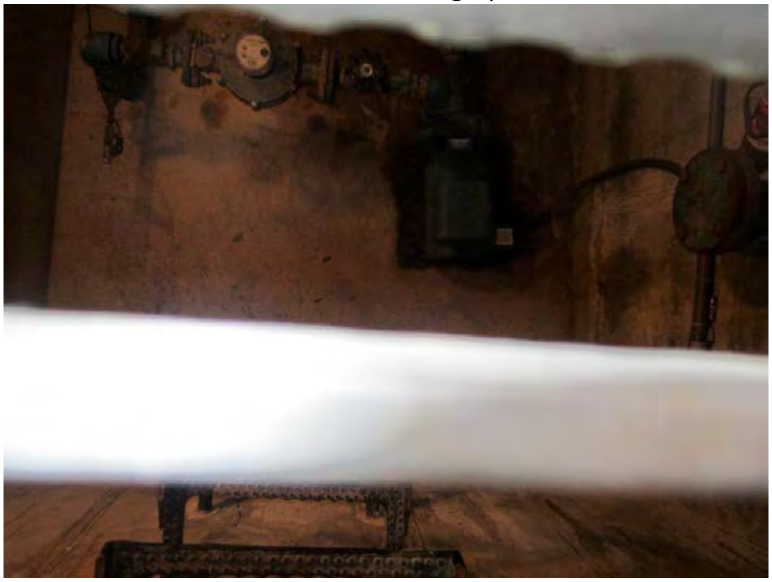
Photograph 32: Farragut Tank shared inflow/outflow to tank floor

Photograph 33: Farragut Tank PLC SCADA relay/radio equipped w back-up battery

Photograph 34: Farragut Tank access ladder

Photograph 35: Cape Horn Booster Station

Photograph 36: Cape Horn booster station propane generator w auto-switchover



Photograph 37: Cape Horn booster station vault

Photograph 38: Cape Horn booster station vault

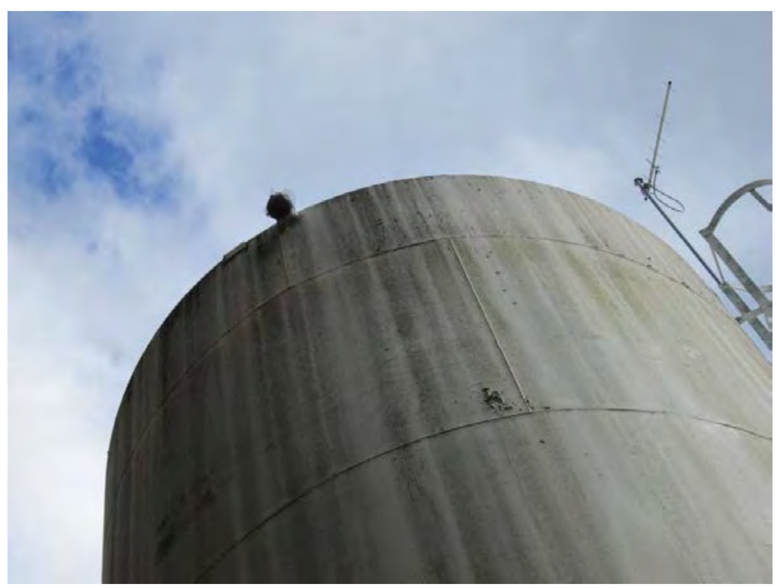
Photograph 39: Cape Horn booster station vault

Photograph 40: Cape Horn booster station flow meter

Photograph 41: Cape Horn booster station

Photograph 42: Cape Horn tanks (30K each)

Photograph 43: Cape Horn tanks shared influent/effluent



Photograph 44: Cape Horn tank screened vent/overflow 1

Photograph 45: Cape Horn tank screened vent/overflow 2

Photograph 46: Farragut tank PRV

Photograph 47: Farragut tank PRV by-pass

Photograph 48: Farragut tank PRV by-pass

Photograph 49: Farragut tank PRV

Photograph 50: Farragut tank PRV w torpedo casing pressure/air release

Photograph 51: Farragut tank PRV

Photograph 52: Dromore booster station


Photograph 53: Dromore booster pumps


Photograph 54: Dromore booster pumps and flow meter


Photograph 55: Pend Oreille tank and booster station


Photograph 56: Pend Oreille tank vent w screen

Photograph 57: Pend Oreille tank overflow

Photograph 58: Pend Oreille tank VFD controls

Photograph 59: Pend Oreille booster pumps

Photograph 60: Pend Oreille boosted discharge tee (PRV required on one tee)

Photograph 61: Pend Oreille boosted discharge (hydro tank waterlogged)

Photograph 62: Pend Oreille boosted discharge

Photograph 63: Pend Oreille booster pump isolation valves

Photograph 64: Limekiln booster propane generator with auto-switchover

Photograph 65: Limekiln booster pump building

Photograph 66: Limekiln booster pumps

Photograph 67: Limekiln suction and boosted discharge lines

Photograph 68: Limekiln booster pump controls

Photograph 69: Limekiln booster pump isolation valves

FINANCIAL CAPACITY

SURVEY DATE		PWS #
3/26/2019	*(mm/dd/yyyy)*	1280014

yes no n/a unk note **FINANCIAL CAPACITY**

☐ ☐ ☐ ☐ ☐ 1. Is the PWS current with the payment of drinking water fees?

☐ ☐ ☐ ☐ ☐ 2. Does the PWS charge a drinking water fee to the user?

If yes, what is the fee: $ ______

☐ ☐ ☐ ☐ ☐ 3. Is the PWS in the business of selling water?

#3 Note: **- If no, identify why in the comments section and mark "N/A" on questions 4 - 19.**

☐ ☐ ☐ ☐ ☐ 4. Does the PWS provide and use an annual budget? *(Recommended)*

☐ ☐ ☐ ☐ ☐ 5. If applicable, is the PWS fund separate from the waste water/sewer utility fund? *(Recommended)*

☐ ☐ ☐ ☐ ☐ 6. Do water system revenues exceed expenditures? *(Recommended)*

☐ ☐ ☐ ☐ ☐ 7. Are controls established to prevent expenditures from exceeding revenues?

☐ ☐ ☐ ☐ ☐ 8. Has an independent financial audit been completed? *(Recommended)*

☐ ☐ ☐ ☐ ☐ 9. If yes, is a copy of the most recent balance sheet for the water system available? *(Recommended)*

☐ ☐ ☐ ☐ ☐ 10. Does the water system include a cash budget within its annual budget for cash flow? *(Recommended)*

☐ ☐ ☐ ☐ ☐ 11. Does the water system management review the user fee, user charge, or rate system at least annually? *(Recommended)*

12. When was the last user fee, user charge, or rate system adjustment?

______ *mm/dd/yyyy*

yes no n/a unk note

☐ ☐ ☐ ☐ ☐ 13. Does the water system management review financial reports at least monthly? *(Recommended)*

☐ ☐ ☐ ☐ ☐ 14. Does the PWS provide and use a capital budget? *(Recommended)*

☐ ☐ ☐ ☐ ☐ 15. Has this PWS produced and does it currently utilize a capital improvements plan? *(Recommended)*

16. If yes, when was the capital improvements budget produced?

______ *mm/dd/yyyy*

☐ ☐ ☐ ☐ ☐ 17. Has the capital improvement budget been updated in the last 18 months? *(Recommended)*

☐ ☐ ☐ ☐ ☐ 18. Does the water system budget provide funding for depreciation of existing plant in service and/or for the funding of reserves for system replacement?

☐ ☐ ☐ ☐ ☐ 19. Are there sufficient funds for training personnel?

COMMENTS:
(Please indicate the question number)

Page ______ Of ______

Appendix 2-C

Hydraulic Calculations

THIS PAGE WAS INTENTIONALLY LEFT BLANK

BWSD Water System Facility Plan

Hydraulic Analysis

System Calibration Using Hydrant Testing Data

Location No.	Location	Elevation (ft)
1	Farragut Tank - Ground	2,330
2	Farragut Tank - Overflow	2,430
3	FH 708 - 17974 E Hwy 54	2,180
4	FH 703 - 1st St and Fir	2,252
5	Main PRV (2190 + 40 psi downstream)	2,282
6	FH 720 - Limekiln and Pier	2,075

This sheet uses system elevations and headloss to calculate a static pressure at various points in the system. This is then compared against static pressures measured during fire hydrant flow testing conducted by Timberlake Fire District.

Hydrant static checks are within 4% of calculated values.

Therefore, system assumptions/information (e.g., tank overflow, friction factor, etc.) seem reasonable.

Darcy-Weisbach Pipe Headloss

Scenario	Pipeline Segment	Q (gpm)	D (in)	A (in^2)	A (ft^2)	V (fps)	L (ft)	Kinematic Viscosity (ft^2/sec)	Reynolds No.	k_s (in)	f	h_L (ft)
1	1	839	12	113.1	0.785	2.38	1,900	1.41E-05	1.69E+05	0.005	0.0188	3.14
	2	839	8	50.3	0.349	5.36	1,100	1.41E-05	2.53E+05	0.005	0.0192	14.12
	3	839	6	28.3	0.196	9.52	1,300	1.41E-05	3.38E+05	0.005	0.0199	72.85
2	1	839	12	113.1	0.785	2.38	1,900	1.41E-05	1.69E+05	0.005	0.0188	3.14
	2	839	8	50.3	0.349	5.36	1,100	1.41E-05	2.53E+05	0.005	0.0192	14.12
	3	839	6	28.3	0.196	9.52	1,750	1.41E-05	3.38E+05	0.005	0.0199	98.06
Below PRV	1	993	8	50.3	0.349	6.34	3,500	1.41E-05	3.00E+05	0.005	0.0190	62.26

1 - Storage Tank to Hydrant 708 at 17974 Hwy 54

Route		
Flow (gpm)	839	
Delta z (ft)	250	
Delta z (psi)	108.2	<-- Static Pressure, Calculated
Fire Flow Static P (psi)	110.0	<-- 2014 hydrant testing
Difference (psi)	-1.8	
Difference (%)	-1.6%	

2 - Storage Tank to Hydrant 703 at 1st and Fir

Route		
Flow (gpm)	839	
Delta z (ft)	178	
Delta z (psi)	77.1	<-- Static Pressure, Calculated
Fire Flow Static P (psi)	80.0	<-- 2012 hydrant testing
Difference (psi)	-2.9	
Difference (%)	-3.8%	

3 - Main PRV to Hydrant 720 at Limekiln and Pier

Route		
Flow (gpm)	993	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure, Calculated
Fire Flow Static P (psi)	92.0	<-- 2012 hydrant testing
Difference (psi)	-2.2	
Difference (%)	-2.5%	

BWSD Water System Facility Plan

Hydraulic Analysis

Existing Average Day Flow

Location No.	Location	Elevation (ft)
1	Farragut Tank - Ground	2,330
2	Farragut Tank - Overflow	**2,430**
3	FH 708 - 17974 E Hwy 54	2,180
4	FH 703 - 1st St and Fir	2,252
5	Main PRV (2190 + 40 psi downstream)	**2,282**
6	FH 720 - Limekiln and Pier	2,075
7	Hudson Bay Road at Vista Bay	2,170
8	FH 713 - N Shore and Arapaho	2,180

Flow Scenario		Flow (gpd)	Flow (gpm)
Existing (2017)			
	Avg. Day	233,500	162
	Max. Day	476,300	331
Future (2037)			
	Avg. Day	334,100	232
	Max. Day	681,600	473
Fire Flow		N/A	1,500

This sheet uses system elevations and headloss to calcualte a static pressure and dynamic pressure at various points in the system under **existing average day flow conditions**. The Swamee & Jane explicit approximation of the Colebrook-White equation is used to determine the friction factor .

The calculated dynamic pressure is then compared against the IDEQ-required minimum operating pressure of 40 psi to detemine if system pressures are adequate at the given flow rate.

The storage tank overflow elevation is the basis for the static pressures in the

Minimum Pressure to Be Maintained 40 psi

Darcy-Weisbach Pipe Headloss

Scenario	Pipeline Segment	Q (gpm)	D (in)	A (in^2)	A (ft^2)	V (fps)	L (ft)	Kinematic Viscosity (ft^2/sec)	Reynolds No.	k_s (in)	f	h_L (ft)
1	1	162	12	113.1	0.785	0.46	1,900	1.41E-05	3.26E+04	0.005	0.0242	0.15
	2	162	8	50.3	0.349	1.03	1,100	1.41E-05	4.89E+04	0.005	0.0231	0.63
	3	162	6	28.3	0.196	1.84	1,300	1.41E-05	6.52E+04	0.005	0.0228	3.12
2	1	162	12	113.1	0.785	0.46	1,900	1.41E-05	3.26E+04	0.005	0.0242	0.15
	2	162	8	50.3	0.349	1.03	1,100	1.41E-05	4.89E+04	0.005	0.0231	0.63
	3	162	6	28.3	0.196	1.84	1,750	1.41E-05	6.52E+04	0.005	0.0228	4.20
3	1	162	12	113.1	0.785	0.46	1,900	1.41E-05	3.26E+04	0.005	0.0242	0.15
	2	162	8	50.3	0.349	1.03	1,100	1.41E-05	4.89E+04	0.005	0.0231	0.63
4	1	162	8	50.3	0.349	1.03	3,500	1.41E-05	4.89E+04	0.005	0.0231	2.02
5	1	162	8	50.3	0.349	1.03	200	1.41E-05	4.89E+04	0.005	0.0231	0.12
	2	162	6	28.3	0.196	1.84	4,200	1.41E-05	6.52E+04	0.005	0.0228	10.09
6	1	162	8	50.3	0.349	1.03	3,500	1.41E-05	4.89E+04	0.005	0.0231	2.02
	2	162	8	50.3	0.349	1.03	900	1.41E-05	4.89E+04	0.005	0.0231	0.52
	3	162	6	28.3	0.196	1.84	1,650	1.41E-05	6.52E+04	0.005	0.0228	3.96

Scenario 1 - Storage Tank to Hydrant 708 at 17974 Hwy 54

Route		
Flow (gpm)	162	
Delta z (ft)	250	
Delta z (psi)	108.2	<-- Static Pressure
Actual h_L (ft)	3.91	<-- Friction headloss
Allowable h_L (ft)	157.6	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	106.5	<-- Pressure at Given Flow

Scenario 2 - Storage Tank to Hydrant 703 at 1st and Fir

Route		
Flow (gpm)	162	
Delta z (ft)	355	
Delta z (psi)	153.7	<-- Static Pressure
Actual h_L (ft)	4.99	<-- Friction headloss
Allowable h_L (ft)	262.6	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	151.5	<-- Pressure at Given Flow

Scenario 3 - Storage Tank to main PRV

Route		
Flow (gpm)	162	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	0.79	<-- Friction headloss
Allowable h_L (ft)	115.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	89.4	<-- Pressure at Given Flow

Scenario 4 - Main PRV to FH 720 - Limekiln and Pier

Route		
Flow (gpm)	162	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	2.02	<-- Friction headloss
Allowable h_L (ft)	115.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	88.9	<-- Pressure at Given Flow

Scenario 5 - Main PRV to east end of Hudson Bay Road at Vista Bay

Route		
Flow (gpm)	162	
Delta z (ft)	112	
Delta z (psi)	48.7	<-- Static Pressure
Actual h_L (ft)	10.20	<-- Friction headloss
Allowable h_L (ft)	20.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	44.2	<-- Pressure at Given Flow

Scenario 6 - Main PRV to FH 713 at N Shore and Arapaho

Route		
Flow (gpm)	162	
Delta z (ft)	102	
Delta z (psi)	44.3	<-- Static Pressure
Actual h_L (ft)	6.50	<-- Friction headloss
Allowable h_L (ft)	10.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	41.5	<-- Pressure at Given Flow

BWSD Water System Facility Plan

Hydraulic Analysis

Existing Maximum Day Flow

Location No.	Location	Elevation (ft)
1	Farragut Tank - Ground	2,330
2	Farragut Tank - Overflow	**2,430**
3	FH 708 - 17974 E Hwy 54	2,180
4	FH 703 - 1st St and Fir	2,252
5	Main PRV (2190 + 40 psi downstream)	**2,282**
6	FH 720 - Limekiln and Pier	2,075
7	Hudson Bay Road at Vista Bay	2,170
8	FH 713 - N Shore and Arapaho	2,180

Flow Scenario		Flow (gpd)	Flow (gpm)
Existing (2017)			
	Avg. Day	233,500	162
	Max. Day	476,300	331
Future (2037)			
	Avg. Day	334,100	232
	Max. Day	681,600	473
Fire Flow		N/A	1,500

This sheet uses system elevations and headloss to calculate a static pressure and dynamic pressure at various points in the system under **existing maximum day flow conditions**. The Swamee & Jane explicit approximation of the Colebrook-White equation is used to determine the friction factor .

The calculated dynamic pressure is then compared against the IDEQ-required minimum operating pressure of 40 psi to detemine if system pressures are adequate at the given flow rate.

The storage tank overflow elevation is the basis for the static pressures in the

Minimum Pressure to Be Maintained 40 psi

Darcy-Weisbach Pipe Headloss

Scenario	Pipeline Segment	Q (gpm)	D (in)	A (in^2)	A (ft^2)	V (fps)	L (ft)	Kinematic Viscosity (ft^2/sec)	Reynolds No.	k_s (in)	f	h_L (ft)
1	1	331	12	113.1	0.785	0.94	1,900	1.41E-05	6.65E+04	0.005	0.0213	0.55
	2	331	8	50.3	0.349	2.11	1,100	1.41E-05	9.98E+04	0.005	0.0209	2.39
	3	331	6	28.3	0.196	3.75	1,300	1.41E-05	1.33E+05	0.005	0.0212	12.04
2	1	331	12	113.1	0.785	0.94	1,900	1.41E-05	6.65E+04	0.005	0.0213	0.55
	2	331	8	50.3	0.349	2.11	1,100	1.41E-05	9.98E+04	0.005	0.0209	2.39
	3	331	6	28.3	0.196	3.75	1,750	1.41E-05	1.33E+05	0.005	0.0212	16.20
3	1	331	12	113.1	0.785	0.94	1,900	1.41E-05	6.65E+04	0.005	0.0213	0.55
	2	331	8	50.3	0.349	2.11	1,100	1.41E-05	9.98E+04	0.005	0.0209	2.39
4	1	331	8	50.3	0.349	2.11	3,500	1.41E-05	9.98E+04	0.005	0.0209	7.61
5	1	331	8	50.3	0.349	2.11	200	1.41E-05	9.98E+04	0.005	0.0209	0.43
	2	331	6	28.3	0.196	3.75	4,200	1.41E-05	1.33E+05	0.005	0.0212	38.88
6	1	331	8	50.3	0.349	2.11	3,500	1.41E-05	9.98E+04	0.005	0.0209	7.61
	2	331	8	50.3	0.349	2.11	900	1.41E-05	9.98E+04	0.005	0.0209	1.96
	3	331	6	28.3	0.196	3.75	1,650	1.41E-05	1.33E+05	0.005	0.0212	15.28

Scenario 1 - Storage Tank to Hydrant 708 at 17974 Hwy 54

Route		
Flow (gpm)	331	
Delta z (ft)	250	
Delta z (psi)	108.2	<-- Static Pressure
Actual h_L (ft)	14.98	<-- Friction headloss
Allowable h_L (ft)	157.6	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	101.7	<-- Pressure at Given Flow

Scenario 2 - Storage Tank to Hydrant 703 at 1st and Fir

Route		
Flow (gpm)	331	
Delta z (ft)	355	
Delta z (psi)	153.7	<-- Static Pressure
Actual h_L (ft)	19.15	<-- Friction headloss
Allowable h_L (ft)	262.6	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	145.4	<-- Pressure at Given Flow

Scenario 3 - Storage Tank to main PRV

Route		
Flow (gpm)	331	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	2.94	<-- Friction headloss
Allowable h_L (ft)	115.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	88.5	<-- Pressure at Given Flow

Scenario 4 - Main PRV to FH 720 - Limekiln and Pier

Route		
Flow (gpm)	331	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	7.61	<-- Friction headloss
Allowable h_L (ft)	115.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	86.5	<-- Pressure at Given Flow

Scenario 5 - Main PRV to east end of Hudson Bay Road at Vista Bay

Route		
Flow (gpm)	331	
Delta z (ft)	112	
Delta z (psi)	48.7	<-- Static Pressure
Actual h_L (ft)	39.32	<-- Friction headloss
Allowable h_L (ft)	20.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	31.6	<-- Pressure at Given Flow

Scenario 6 - Main PRV to FH 713 at N Shore and Arapaho

Route		
Flow (gpm)	331	
Delta z (ft)	102	
Delta z (psi)	44.3	<-- Static Pressure
Actual h_L (ft)	24.84	<-- Friction headloss
Allowable h_L (ft)	10.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	33.6	<-- Pressure at Given Flow

BWSD Water System Facility Plan
Hydraulic Analysis
Future - Maximum Day Flow

Location No.	Location	Elevation (ft)
1	Farragut Tank - Ground	2,330
2	Farragut Tank - Overflow	**2,430**
3	FH 708 - 17974 E Hwy 54	2,180
4	FH 703 - 1st St and Fir	2,252
5	Main PRV (2190 + 40 psi downstream)	**2,282**
6	FH 720 - Limekiln and Pier	2,075
7	Hudson Bay Road at Vista Bay	2,170
8	FH 713 - N Shore and Arapaho	2,180

Flow Scenario	Flow (gpd)	Flow (gpm)
Existing (2017)		
Avg. Day	233,500	162
Max. Day	476,300	331
Future (2037)		
Avg. Day	334,100	232
Max. Day	681,600	473
Fire Flow	N/A	1,500

This sheet uses system elevations and headloss to calculate a static pressure and dynamic pressure at various points in the system under **future maximum day flow conditions**. The Swamee & Jane explicit approximation of the Colebrook-White equation is used to determine the friction factor .

The calculated dynamic pressure is then compared against the IDEQ-required minimum operating pressure of 40 psi to detemine if system pressures are adequate at the given flow rate.

The storage tank overflow elevation is the basis for the static pressures in the

Minimum Pressure to Be Maintained 40 psi

Darcy-Weisbach Pipe Headloss

Scenario	Pipeline Segment	Q (gpm)	D (in)	A (in^2)	A (ft^2)	V (fps)	L (ft)	Kinematic Viscosity (ft^2/sec)	Reynolds No.	k_s (in)	f	h_L (ft)
1	1	473	12	113.1	0.785	1.34	1,900	1.41E-05	9.52E+04	0.005	0.0202	1.07
	2	473	8	50.3	0.349	3.02	1,100	1.41E-05	1.43E+05	0.005	0.0202	4.71
	3	473	6	28.3	0.196	5.37	1,300	1.41E-05	1.90E+05	0.005	0.0206	23.96
2	1	473	12	113.1	0.785	1.34	1,900	1.41E-05	9.52E+04	0.005	0.0202	1.07
	2	473	8	50.3	0.349	3.02	1,100	1.41E-05	1.43E+05	0.005	0.0202	4.71
	3	473	6	28.3	0.196	5.37	1,750	1.41E-05	1.90E+05	0.005	0.0206	32.26
3	1	473	12	113.1	0.785	1.34	1,900	1.41E-05	9.52E+04	0.005	0.0202	1.07
	2	473	8	50.3	0.349	3.02	1,100	1.41E-05	1.43E+05	0.005	0.0202	4.71
4	1	473	8	50.3	0.349	3.02	3,500	1.41E-05	1.43E+05	0.005	0.0202	15.00
5	1	473	8	50.3	0.349	3.02	200	1.41E-05	1.43E+05	0.005	0.0202	0.86
	2	473	6	28.3	0.196	5.37	4,200	1.41E-05	1.90E+05	0.005	0.0206	77.42
6	1	473	8	50.3	0.349	3.02	3,500	1.41E-05	1.43E+05	0.005	0.0202	15.00
	2	473	8	50.3	0.349	3.02	900	1.41E-05	1.43E+05	0.005	0.0202	3.86
	3	473	6	28.3	0.196	5.37	1,650	1.41E-05	1.90E+05	0.005	0.0206	30.42

Scenario 1 - Storage Tank to Hydrant 708 at 17974 Hwy 54

Route		
Flow (gpm)	473	
Delta z (ft)	250	
Delta z (psi)	108.2	<-- Static Pressure
Actual h_L (ft)	29.75	<-- Friction headloss
Allowable h_L (ft)	157.6	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	95.3	<-- Pressure at Given Flow

Scenario 2 - Storage Tank to Hydrant 703 at 1st and Fir

Route		
Flow (gpm)	473	
Delta z (ft)	355	
Delta z (psi)	153.7	<-- Static Pressure
Actual h_L (ft)	38.05	<-- Friction headloss
Allowable h_L (ft)	262.6	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	137.2	<-- Pressure at Given Flow

Scenario 3 - Storage Tank to main PRV

Route		
Flow (gpm)	473	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	5.79	<-- Friction headloss
Allowable h_L (ft)	115.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	87.3	<-- Pressure at Given Flow

Scenario 4 - Main PRV to FH 720 - Limekiln and Pier

Route		
Flow (gpm)	473	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	15.00	<-- Friction headloss
Allowable h_L (ft)	115.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	83.3	<-- Pressure at Given Flow

Scenario 5 - Main PRV to east end of Hudson Bay Road at Vista Bay

Route		
Flow (gpm)	473	
Delta z (ft)	112	
Delta z (psi)	48.7	<-- Static Pressure
Actual h_L (ft)	78.28	<-- Friction headloss
Allowable h_L (ft)	20.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	14.8	<-- Pressure at Given Flow

Scenario 6 - Main PRV to FH 713 at N Shore and Arapaho

Route		
Flow (gpm)	473	
Delta z (ft)	102	
Delta z (psi)	44.3	<-- Static Pressure
Actual h_L (ft)	49.27	<-- Friction headloss
Allowable h_L (ft)	10.0	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	23.0	<-- Pressure at Given Flow

BWSD Water System Facility Plan

Hydraulic Analysis

Fire Flow - 500 gpm

Location No.	Location	Elevation (ft)
1	Farragut Tank - Ground	2,330
2	Farragut Tank - Overflow	**2,430**
3	FH 708 - 17974 E Hwy 54	2,180
4	FH 703 - 1st St and Fir	2,252
5	Main PRV (2190 + 40 psi downstream)	**2,282**
6	FH 720 - Limekiln and Pier	2,075
7	Hudson Bay Road at Vista Bay	2,170
8	FH 713 - N Shore and Arapaho	2,180

Flow Scenario		Flow (gpd)	Flow (gpm)
Existing (2017)			
	Avg. Day	233,500	162
	Max. Day	476,300	331
Future (2037)			
	Avg. Day	334,100	232
	Max. Day	681,600	473
Fire Flow		N/A	500

This sheet uses system elevations and headloss to calculate a static pressure and dynamic pressure at various points in the system under **the specified fire flow conditions**. The Swamee & Jane explicit approximation of the Colebrook-White equation is used to determine the friction factor .

The calculated dynamic pressure is then compared against the IDEQ-required minimum operating pressure of 20 psi to detemine if system pressures are adequate at the given flow rate.

The storage tank overflow elevation is the basis for the static pressures in the

Minimum Pressure to Be Maintained 20 psi

Darcy-Weisbach Pipe Headloss

Scenario	Pipeline Segment	Q (gpm)	D (in)	A (in^2)	A (ft^2)	V (fps)	L (ft)	Kinematic Viscosity (ft^2/sec)	Reynolds No.	k_s (in)	f	h_L (ft)
1	1	500	12	113.1	0.785	1.42	1,900	1.41E-05	1.01E+05	0.005	0.0200	1.19
	2	500	8	50.3	0.349	3.19	1,100	1.41E-05	1.51E+05	0.005	0.0200	5.23
	3	500	6	28.3	0.196	5.67	1,300	1.41E-05	2.01E+05	0.005	0.0205	26.64
2	1	500	12	113.1	0.785	1.42	1,900	1.41E-05	1.01E+05	0.005	0.0200	1.19
	2	500	8	50.3	0.349	3.19	1,100	1.41E-05	1.51E+05	0.005	0.0200	5.23
	3	500	6	28.3	0.196	5.67	1,750	1.41E-05	2.01E+05	0.005	0.0205	35.86
3	1	500	12	113.1	0.785	1.42	1,900	1.41E-05	1.01E+05	0.005	0.0200	1.19
	2	500	8	50.3	0.349	3.19	1,100	1.41E-05	1.51E+05	0.005	0.0200	5.23
4	1	500	8	50.3	0.349	3.19	3,500	1.41E-05	1.51E+05	0.005	0.0200	16.65
5	1	500	8	50.3	0.349	3.19	200	1.41E-05	1.51E+05	0.005	0.0200	0.95
	2	500	6	28.3	0.196	5.67	4,200	1.41E-05	2.01E+05	0.005	0.0205	86.07
6	1	500	8	50.3	0.349	3.19	3,500	1.41E-05	1.51E+05	0.005	0.0200	16.65
	2	500	8	50.3	0.349	3.19	900	1.41E-05	1.51E+05	0.005	0.0200	4.28
	3	500	6	28.3	0.196	5.67	1,650	1.41E-05	2.01E+05	0.005	0.0205	33.81

Scenario 1 - Storage Tank to Hydrant 708 at 17974 Hwy 54

Route		
Flow (gpm)	500	
Delta z (ft)	250	
Delta z (psi)	108.2	<-- Static Pressure
Actual h_L (ft)	33.06	<-- Friction headloss
Allowable h_L (ft)	203.8	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	93.9	<-- Pressure at Given Flow

Scenario 2 - Storage Tank to Hydrant 703 at 1st and Fir

Route		
Flow (gpm)	500	
Delta z (ft)	355	
Delta z (psi)	153.7	<-- Static Pressure
Actual h_L (ft)	42.28	<-- Friction headloss
Allowable h_L (ft)	308.8	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	135.4	<-- Pressure at Given Flow

Scenario 3 - Storage Tank to main PRV

Route		
Flow (gpm)	500	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	6.42	<-- Friction headloss
Allowable h_L (ft)	161.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	87.0	<-- Pressure at Given Flow

Scenario 4 - Main PRV to FH 720 - Limekiln and Pier

Route		
Flow (gpm)	500	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	16.65	<-- Friction headloss
Allowable h_L (ft)	161.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	82.6	<-- Pressure at Given Flow

Scenario 5 - Main PRV to east end of Hudson Bay Road at Vista Bay

Route		
Flow (gpm)	500	
Delta z (ft)	112	
Delta z (psi)	48.7	<-- Static Pressure
Actual h_L (ft)	87.02	<-- Friction headloss
Allowable h_L (ft)	66.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	11.0	<-- Pressure at Given Flow

Scenario 6 - Main PRV to FH 713 at N Shore and Arapaho

Route		
Flow (gpm)	500	
Delta z (ft)	102	
Delta z (psi)	44.3	<-- Static Pressure
Actual h_L (ft)	54.74	<-- Friction headloss
Allowable h_L (ft)	56.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	20.6	<-- Pressure at Given Flow

BWSD Water System Facility Plan

Hydraulic Analysis

Fire Flow - 1000 gpm

Location No.	Location	Elevation (ft)
1	Farragut Tank - Ground	2,330
2	Farragut Tank - Overflow	**2,430**
3	FH 708 - 17974 E Hwy 54	2,180
4	FH 703 - 1st St and Fir	2,252
5	Main PRV (2190 + 40 psi downstream)	**2,282**
6	FH 720 - Limekiln and Pier	2,075
7	Hudson Bay Road at Vista Bay	2,170
8	FH 713 - N Shore and Arapaho	2,180

Flow Scenario		Flow (gpd)	Flow (gpm)
Existing (2017)			
	Avg. Day	233,500	162
	Max. Day	476,300	331
Future (2037)			
	Avg. Day	334,100	232
	Max. Day	681,600	473
Fire Flow		N/A	1,000

This sheet uses system elevations and headloss to calculate a static pressure and dynamic pressure at various points in the system under **the specified fire flow conditions**. The Swamee & Jane explicit approximation of the Colebrook-White equation is used to determine the friction factor .

The calculated dynamic pressure is then compared against the IDEQ-required minimum operating pressure of 20 psi to detemine if system pressures are adequate at the given flow rate.

The storage tank overflow elevation is the basis for the static pressures in the

Minimum Pressure to Be Maintained 20 psi

Darcy-Weisbach Pipe Headloss

Scenario	Pipeline Segment	Q (gpm)	D (in)	A (in^2)	A (ft^2)	V (fps)	L (ft)	Kinematic Viscosity (ft^2/sec)	Reynolds No.	k_s (in)	f	h_L (ft)
1	1	1000	12	113.1	0.785	2.84	1,900	1.41E-05	2.01E+05	0.005	0.0185	4.39
	2	1000	8	50.3	0.349	6.38	1,100	1.41E-05	3.02E+05	0.005	0.0190	19.84
	3	1000	6	28.3	0.196	11.35	1,300	1.41E-05	4.02E+05	0.005	0.0198	102.69
2	1	1000	12	113.1	0.785	2.84	1,900	1.41E-05	2.01E+05	0.005	0.0185	4.39
	2	1000	8	50.3	0.349	6.38	1,100	1.41E-05	3.02E+05	0.005	0.0190	19.84
	3	1000	6	28.3	0.196	11.35	1,750	1.41E-05	4.02E+05	0.005	0.0198	138.24
3	1	1000	12	113.1	0.785	2.84	1,900	1.41E-05	2.01E+05	0.005	0.0185	4.39
	2	1000	8	50.3	0.349	6.38	1,100	1.41E-05	3.02E+05	0.005	0.0190	19.84
4	1	1000	8	50.3	0.349	6.38	3,500	1.41E-05	3.02E+05	0.005	0.0190	63.12
5	1	1000	8	50.3	0.349	6.38	200	1.41E-05	3.02E+05	0.005	0.0190	3.61
	2	1000	6	28.3	0.196	11.35	4,200	1.41E-05	4.02E+05	0.005	0.0198	331.77
6	1	1000	8	50.3	0.349	6.38	3,500	1.41E-05	3.02E+05	0.005	0.0190	63.12
	2	1000	8	50.3	0.349	6.38	900	1.41E-05	3.02E+05	0.005	0.0190	16.23
	3	1000	6	28.3	0.196	11.35	1,650	1.41E-05	4.02E+05	0.005	0.0198	130.34

Scenario 1 - Storage Tank to Hydrant 708 at 17974 Hwy 54

Route		
Flow (gpm)	1000	
Delta z (ft)	250	
Delta z (psi)	108.2	<-- Static Pressure
Actual h_L (ft)	126.91	<-- Friction headloss
Allowable h_L (ft)	203.8	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	53.3	<-- Pressure at Given Flow

Scenario 2 - Storage Tank to Hydrant 703 at 1st and Fir

Route		
Flow (gpm)	1000	
Delta z (ft)	355	
Delta z (psi)	153.7	<-- Static Pressure
Actual h_L (ft)	162.46	<-- Friction headloss
Allowable h_L (ft)	308.8	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	83.4	<-- Pressure at Given Flow

Scenario 3 - Storage Tank to main PRV

Route		
Flow (gpm)	1000	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	24.22	<-- Friction headloss
Allowable h_L (ft)	161.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	79.3	<-- Pressure at Given Flow

Scenario 4 - Main PRV to FH 720 - Limekiln and Pier

Route		
Flow (gpm)	1000	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	63.12	<-- Friction headloss
Allowable h_L (ft)	161.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	62.5	<-- Pressure at Given Flow

Scenario 5 - Main PRV to east end of Hudson Bay Road at Vista Bay

Route		
Flow (gpm)	1000	
Delta z (ft)	112	
Delta z (psi)	48.7	<-- Static Pressure
Actual h_L (ft)	335.38	<-- Friction headloss
Allowable h_L (ft)	66.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	-96.5	<-- Pressure at Given Flow

Scenario 6 - Main PRV to FH 713 at N Shore and Arapaho

Route		
Flow (gpm)	1000	
Delta z (ft)	102	
Delta z (psi)	44.3	<-- Static Pressure
Actual h_L (ft)	209.69	<-- Friction headloss
Allowable h_L (ft)	56.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	-46.4	<-- Pressure at Given Flow

BWSD Water System Facility Plan

Hydraulic Analysis

Fire Flow - 1500 gpm

Location No.	Location	Elevation (ft)
1	Farragut Tank - Ground	2,330
2	Farragut Tank - Overflow	**2,430**
3	FH 708 - 17974 E Hwy 54	2,180
4	FH 703 - 1st St and Fir	2,252
5	Main PRV (2190 + 40 psi downstream)	**2,282**
6	FH 720 - Limekiln and Pier	2,075
7	Hudson Bay Road at Vista Bay	2,170
8	FH 713 - N Shore and Arapaho	2,180

Flow Scenario		Flow (gpd)	Flow (gpm)
Existing (2017)			
	Avg. Day	233,500	162
	Max. Day	476,300	331
Future (2037)			
	Avg. Day	334,100	232
	Max. Day	681,600	473
Fire Flow		N/A	1,500

This sheet uses system elevations and headloss to calculate a static pressure and dynamic pressure at various points in the system under **the specified fire flow conditions**. The Swamee & Jane explicit approximation of the Colebrook-White equation is used to determine the friction factor .

The calculated dynamic pressure is then compared against the IDEQ-required minimum operating pressure of 20 psi to detemine if system pressures are adequate at the given flow rate.

The storage tank overflow elevation is the basis for the static pressures in the

Minimum Pressure to Be Maintained 20 psi

Darcy-Weisbach Pipe Headloss

Scenario	Pipeline Segment	Q (gpm)	D (in)	A (in^2)	A (ft^2)	V (fps)	L (ft)	Kinematic Viscosity (ft^2/sec)	Reynolds No.	k_s (in)	f	h_L (ft)
1	1	1500	12	113.1	0.785	4.26	1,900	1.41E-05	3.02E+05	0.005	0.0178	9.52
	2	1500	8	50.3	0.349	9.57	1,100	1.41E-05	4.53E+05	0.005	0.0186	43.68
	3	1500	6	28.3	0.196	17.02	1,300	1.41E-05	6.04E+05	0.005	0.0195	227.77
2	1	1500	12	113.1	0.785	4.26	1,900	1.41E-05	3.02E+05	0.005	0.0178	9.52
	2	1500	8	50.3	0.349	9.57	1,100	1.41E-05	4.53E+05	0.005	0.0186	43.68
	3	1500	6	28.3	0.196	17.02	1,750	1.41E-05	6.04E+05	0.005	0.0195	306.61
3	1	1500	12	113.1	0.785	4.26	1,900	1.41E-05	3.02E+05	0.005	0.0178	9.52
	2	1500	8	50.3	0.349	9.57	1,100	1.41E-05	4.53E+05	0.005	0.0186	43.68
4	1	1500	8	50.3	0.349	9.57	3,500	1.41E-05	4.53E+05	0.005	0.0186	138.97
5	1	1500	8	50.3	0.349	9.57	200	1.41E-05	4.53E+05	0.005	0.0186	7.94
	2	1500	6	28.3	0.196	17.02	4,200	1.41E-05	6.04E+05	0.005	0.0195	735.87
6	1	1500	8	50.3	0.349	9.57	3,500	1.41E-05	4.53E+05	0.005	0.0186	138.97
	2	1500	8	50.3	0.349	9.57	900	1.41E-05	4.53E+05	0.005	0.0186	35.74
	3	1500	6	28.3	0.196	17.02	1,650	1.41E-05	6.04E+05	0.005	0.0195	289.09

Scenario 1 - Storage Tank to Hydrant 708 at 17974 Hwy 54

Route		
Flow (gpm)	1500	
Delta z (ft)	250	
Delta z (psi)	108.2	<-- Static Pressure
Actual h_L (ft)	280.97	<-- Friction headloss
Allowable h_L (ft)	203.8	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	-13.4	<-- Pressure at Given Flow

Scenario 2 - Storage Tank to Hydrant 703 at 1st and Fir

Route		
Flow (gpm)	1500	
Delta z (ft)	355	
Delta z (psi)	153.7	<-- Static Pressure
Actual h_L (ft)	359.81	<-- Friction headloss
Allowable h_L (ft)	308.8	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	-2.1	<-- Pressure at Given Flow

Scenario 3 - Storage Tank to main PRV

Route		
Flow (gpm)	1500	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	53.20	<-- Friction headloss
Allowable h_L (ft)	161.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	66.8	<-- Pressure at Given Flow

Scenario 4 - Main PRV to FH 720 - Limekiln and Pier

Route		
Flow (gpm)	1500	
Delta z (ft)	207	
Delta z (psi)	89.8	<-- Static Pressure
Actual h_L (ft)	138.97	<-- Friction headloss
Allowable h_L (ft)	161.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	YES	
Dynamic P (psi)	29.6	<-- Pressure at Given Flow

Scenario 5 - Main PRV to east end of Hudson Bay Road at Vista Bay

Route		
Flow (gpm)	1500	
Delta z (ft)	112	
Delta z (psi)	48.7	<-- Static Pressure
Actual h_L (ft)	743.81	<-- Friction headloss
Allowable h_L (ft)	66.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	-273.3	<-- Pressure at Given Flow

Scenario 6 - Main PRV to FH 713 at N Shore and Arapaho

Route		
Flow (gpm)	1500	
Delta z (ft)	102	
Delta z (psi)	44.3	<-- Static Pressure
Actual h_L (ft)	463.80	<-- Friction headloss
Allowable h_L (ft)	56.2	<-- Allowable hL to Maintain Min. Req. P
Adequate h_L ?	NO	
Dynamic P (psi)	-156.4	<-- Pressure at Given Flow

Model Development Memo

DATE: September 17, 2019

TO: Steve James, P.E.

FROM: Colt Shelton, P.E.

SUBJECT: **20-17-070 Bayview Water Sewer District Facility Plan – Hydraulic Model Development**

I. Introduction

The intent of this memorandum is to summarize the information, assumptions, and calibration criteria used to develop the Bayview Water Sewer District (BWSD) water system hydraulic model. The development of the water system model was part of the BWSD Facility Plan.

The objective of the water model was to determine existing water system pressures and available fire flows for the BWSD water system and run one new scenario for system response to an additional 12-inch water main completed on the west side of the system.

II. Model Development

The information for the BWSD water system layout was available in a Graphical Information System (GIS) format developed/updated as part of the Facility Planning effort and was vetted with BWSD staff. The pipe size and locations were imported to WaterCAD Connect Edition, distributed by Bentley Systems, Inc. Additionally, the BWSD Water System Facility Plan was relied on to determine tank size and levels, pressure reducing value (PRV) locations, and pumping capacities throughout the BWSD system.

System elevations at pipe intersections and fire hydrants were gathered from a Digital Elevation Model (DEM), available from the United States Geological Survey (USGS), at a 32.8-foot (10-meter) grid density. The elevations were extracted from the DEM and 10 percent were spot checked against Google Earth elevations to provide a level of confidence in the elevation data.

Once the system pipes, nodes, fire hydrants, tanks, PRV's, and pumps were imported into the WaterCAD model, a model verification was completed to check connectivity of the pipes and data entry errors. The verification process iteratively worked through the system until no model errors were present. Once the verification process was completed, a model simulation for the system was completed to provide a final check for data entry errors by reviewing model pressures. After fixing locations were pressures indicated errant data, the model was reviewed by Jessica Waller as a QC of the system layout.

The final step to the model development was to calibrate the model based on historic fire flow tests completed by the BWSD staff. Model calibration will be discussed below in the **Model Calibration** section.

System average day demand (ADD), max day demand (MDD), and peak hour demand (PHD) were developed during the facility planning process and were used for the water model. The following table provides system flow demands.

Flow Demand	Current Demand (GPM)	Future Demand (GPM)
ADD	162	232
MDD	331	473
PHD	530	759

III. Model Assumptions

The water system model for the BWSD relies on the following assumptions, which have been incorporated into the model. The model simulations were completed on a steady state analysis.

1. Pumps run at the design point determined in the Water System Facility Plan. This assumption is required because pump curves were not available for the wells and booster station pumps. WaterCAD allows six different pump definition types. The one used in the BWSD water model is based on single design point on the pump curve. The single design point option has a predefined equation that fits a pump curve to the design point. This approach allows the system to reach equilibrium as the pump can adjust flow rates to match the system conditions but requires the pumping rate be verified against the design point after the run. If the rates are different, the pump curve is adjusted so the final model pumping rate matches the design point pumping rate.
2. Water tanks are two feet below the maximum tank elevation or tank overflow elevation. The water system supply is greater than the peak hour demand, allowing the wells to keep the system at nearly full levels during normal operation.
3. The existing PRV on the southwest side of the system was set to the pressures reported by BWSD staff. The PRV's on the north east side of the system were set to match reported system pressures as operational settings were not available.
4. Historic fire flow tests provided by the BWSD were checked in the model at ADD with the well and boosters running and the tanks at two feet below maximum levels or two feet below overflow levels.
5. Fire flow results within ± 25 percent of the historic fire flow tests were considered acceptable. Historical fire flow tests did not have information about the demand conditions during the test, tank elevations or pump status. Without the aid of the

system operating characteristics for each fire flow test, either many additional assumptions would be required to try and recreate the conditions during the given test, or the larger range 25% can be used.

6. Pipe materials were summarized into two groups, PVC and other. The Hazen-Williams coefficient (C) for PVC material was set at 120 and the C for the other pipes were set at 100.
7. Only pipes 4” and larger were modeled in the system. There are two exceptions to this:
    a. A 500-foot length of 2” pipe along E Perimeter Rd after the intersection with N Main Ave/Hwy 54.
    b. A 1,000-foot length of 2” pipe looping along N. Terrace Drive.
8. In general, fire flow requirements are:
    a. 500 gpm for two hours in the Cape Horn Estates area
    b. 1,000 gpm for one hour in residential areas
    c. 1,500 for two hours in commercial areas

IV. Model Calibration

Six fire hydrant flow tests were used to check the water model for large demand events. The test locations are shown in **Figure 1** below.

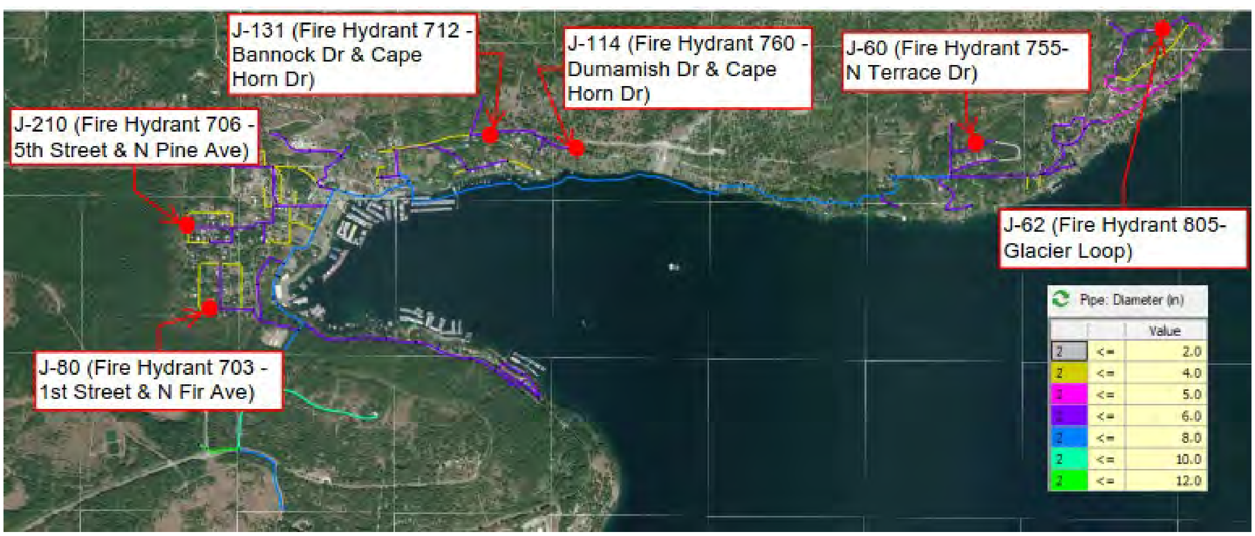


Figure 1 - Fire Flow Historic Test Locations

The six tests were within 2 to 13 psi of the result of the historic fire flow tests performed by BWSD staff and were within the range of values observed during the historic tests or within ± 25 percent of the historic test values. With the general agreement of the model and the historical fire flow tests, the model was considered calibrated and additional refinement of pipe C values, valve settings, elevations, etc. were not required.

Appendix 2-D

Fire Hydrant Testing Reports

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Ellery Howard

From: Ellery Howard
Sent: Friday, September 14, 2018 12:22 PM
To: Bill Steele
Subject: Bayview Area - target fire flows for water system planning

Chief Steele,

I am following up with you on our discussions from today and earlier this year related to the target fire flows in the Bayview area. In our discussions related to the Bayview Water & Sewer District's (BWSD) water system planning efforts, you indicated that Timberlake FPD had flow tested the hydrants on the existing water system several times over the years. Based on the fire flow data that you compiled and previous Fire District policies, you indicated that there is always room for improvement but that there were generally no glaring inadequacies based on existing conditions for residential areas, with the exception of the inadequate and very small tank (11,000 gallons) in the Dromore area. With that said, it is my understanding that you would prefer to see the following target fire flows and duration be addressed in future water system improvements:

- Residential Areas (single family homes up to 3,600 SF): 1,000 gpm for 1 hour
- Larger Residential/Commercial Areas: 1,500 gpm for 2 hours

Obviously these are just targets and any future commercial construction would need to be evaluated by Timberlake FPD based on building construction materials, building area, location, and available fire flow, etc. As we wrap up the planning efforts for the BWSD water system, I just wanted to confirm these fire flow targets/goals with you.

It should be noted that during the construction project that extended water service out to the Cape Horn Area in 2002, the Fire District indicated that a flow of 500 gpm for 2 hours (60,000 gallons) was the requested goal since it was considered a rural area with inadequate water supply. One of the areas that was deemed acceptable at that time was the far end of the Cape Horn that has a total of 60,000 gallons of storage serving approximately 10-15 households.

Thanks again for all of your assistance in this planning effort. Let me know if you have any questions or clarifications.

ELLERY HOWARD, P.E.
Project Manager

J-U-B ENGINEERS, Inc.
7825 Meadowlark Way, Coeur d'Alene, Idaho 83815
e ehoward@jub.com *w* www.jub.com
p 208 762 8787 *f* 208 762 9797

TLFD

Hydrant Flow Test By Hydrant

District = "01   "

702 — 16010 E 5TH ST & N SPRUCE AVE — AMERICAN — B62B

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	85	30	30.00	0.00	919	1006	1087	1163
	<No Staff Member Listed>							
09/25/2012	85	41	31.00	0.00	934	1153	1246	1333
JGERNNS	Gernns, Joshua							
10/14/2013	90	50	40.00	0.00	1061	1435	1543	1644
BHERMENET	Hermenet, Brandon							
05/31/2014	95	50	40.00	0.00	1061	1398	1496	1588
	<No Staff Member Listed>							
Subtotal Flow Tests:		**4**		**Min:**	**919**	**1006**	**1087**	**1163**
				Max:	**1061**	**1435**	**1543**	**1644**
				Avg:	**993**	**1248**	**1343**	**1432**

703 — 16262 E 1ST ST & N FIR AVE — AMERICAN — B62B

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	80	28	24.00	0.00	822	888	965	1037
	<No Staff Member Listed>							
09/25/2012	80	30	25.00	0.00	839	926	1006	1081
JGERNNS	Gernns, Joshua							
05/31/2014	90	20	15.00	0.00	650	650	699	744
	<No Staff Member Listed>							
Subtotal Flow Tests:		**3**		**Min:**	**650**	**650**	**699**	**744**
				Max:	**839**	**926**	**1006**	**1081**
				Avg:	**770**	**821**	**890**	**954**

705 — 34082 E 4TH ST & N FIR AVE — AMERICAN — B62B

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	52	18	25.00	0.00	839	812	940	1055
	<No Staff Member Listed>							
09/20/2012	50	18	15.00	0.00	650	628	733	827
JGERNNS	Gernns, Joshua							
10/14/2013	50	15	10.00	0.00	531	489	571	644
BHERMENET	Hermenet, Brandon							

*** Scheduled Flow Test**

705 **34082 E 4TH ST & N FIR AVE** **AMERICAN** **B62B**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
05/31/2014	60	20	10.00	0.00	531	531	599	661
	<No Staff Member Listed>							
Subtotal Flow Tests:		**4**		**Min:**	**531**	**489**	**571**	**644**
				Max:	**839**	**812**	**940**	**1055**
				Avg:	**637**	**615**	**710**	**796**

706 **16025 E 5TH ST & N PINE AVE** **AMERICAN** **B62B**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	50	20	27.00	0.00	872	872	1019	1149
	<No Staff Member Listed>							
09/20/2012	55	17	15.00	0.00	650	622	712	794
JGERNNS	Gernns, Joshua							
10/14/2013	55	17	15.00	0.00	650	622	712	794
BHERMENET	Hermenet, Brandon							
05/31/2014	60	20	10.00	0.00	531	531	599	661
CTYLER	Tyler, Caleb N							
Subtotal Flow Tests:		**4**		**Min:**	**531**	**531**	**599**	**661**
				Max:	**872**	**872**	**1019**	**1149**
				Avg:	**675**	**661**	**760**	**849**

707 **E 5TH ST & N SPRUCE AVE** **AMERICAN** **B62B**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	60	22	28.00	0.00	888	913	1030	1136
	<No Staff Member Listed>							
09/20/2012	60	20	18.00	0.00	712	712	803	886
JGERNNS	Gernns, Joshua							
10/14/2013	62	20	5.00	0.00	375	375	421	463
BHERMENET	Hermenet, Brandon							
05/31/2014	70	22	15.00	0.00	650	664	733	797
CTYLER	Tyler, Caleb N							

707 E 5TH ST & N SPRUCE AVE AMERICAN B62B

Date	Static	Residual	Pitot	Pitot 2		GPM	20 PSI	10 PSI	0 PSI
Subtotal Flow Tests:		**4**			**Min:**	**375**	**375**	**421**	**463**
					Max:	**888**	**913**	**1030**	**1136**
					Avg:	**656**	**666**	**746**	**820**

708 17974 E HIGHWAY 54 WATEROUS 150

Date	Static	Residual	Pitot	Pitot 2		GPM	20 PSI	10 PSI	0 PSI
09/01/2010	100	58	25.00	0.00		839	1188	1266	1340
	<No Staff Member Listed>								
09/25/2012	104	48	30.00	0.00		919	1144	1216	1284
JGERNNS	Gernns, Joshua								
10/14/2013	110	55	40.00	0.00		1061	1384	1465	1543
BHERMENET	Hermenet, Brandon								
05/31/2014	110	45	25.00	0.00		839	1000	1059	1115
CTYLER	Tyler, Caleb N								
Subtotal Flow Tests:		**4**			**Min:**	**839**	**1000**	**1059**	**1115**
					Max:	**1061**	**1384**	**1465**	**1543**
					Avg:	**914**	**1179**	**1251**	**1320**

709 33955 N MOONBEAM CT & E HIGHWAY 54 WATEROUS 150

Date	Static	Residual	Pitot	Pitot 2		GPM	20 PSI	10 PSI	0 PSI
09/01/2010	120	25	20.00	0.00		750	771	812	851
	<No Staff Member Listed>								
09/25/2012	125	28	20.00	0.00		750	783	822	860
JGERNNS	Gernns, Joshua								
10/14/2013	95	30	20.00	0.00		750	810	867	921
BHERMENET	Hermenet, Brandon								
05/31/2014	85	30	10.00	0.00		531	581	628	672
CTYLER	Tyler, Caleb N								
Subtotal Flow Tests:		**4**			**Min:**	**531**	**581**	**628**	**672**
					Max:	**750**	**810**	**867**	**921**
					Avg:	**695**	**736**	**782**	**826**

TLFD

Hydrant Flow Test By Hydrant

District = "01   "

712 E BANNOCK DR & CAPE HORN DR AMERICAN B62B

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	80	50	24.00	0.00	822	1195	1299	1396
	<No Staff Member Listed>							
09/20/2012	78	55	45.00	0.00	1126	1855	2022	2177
JGERNNS	Gernns, Joshua							
10/14/2013	75	56	45.00	0.00	1126	1999	2188	2363
107	Kaplan, Andrew							
07/30/2015	75	48	40.00	0.00	1061	1558	1705	1842
KWRIGHT	Wright, Kody							
Subtotal Flow Tests:		**4**		**Min:**	**822**	**1195**	**1299**	**1396**
				Max:	**1126**	**1999**	**2188**	**2363**
				Avg:	**1033**	**1651**	**1803**	**1944**

713 17375 E NORTH SHORE LN & E ARAPAHO RD AMERICAN B62B

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	50	10	5.00	0.00	375	321	375	423
	<No Staff Member Listed>							
09/20/2012	55	12	9.00	0.00	503	450	516	575
JGERNNS	Gernns, Joshua							
10/14/2013	50	10	10.00	0.00	531	455	531	599
JBRODIN	Brodin, Justin							
06/07/2014	58	15	10.00	0.00	531	497	563	624
SMICHAEL	Michael, Seth							
09/03/2015	54	18	10.00	0.00	531	515	592	661
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**5**		**Min:**	**375**	**321**	**375**	**423**
				Max:	**531**	**515**	**592**	**661**
				Avg:	**494**	**447**	**515**	**576**

*** Scheduled Flow Test**

714 **17724 E NORTH SHORE LN** **AMERICAN** **B62B**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	80	20	11.00	0.00	557	557	605	651
	<No Staff Member Listed>							
09/20/2012	78	21	14.00	0.00	628	634	691	744
JGERNNS	Gernns, Joshua							
10/14/2013	70	20	15.00	0.00	650	650	717	780
BHERMENET	Hermenet, Brandon							
06/07/2014	80	25	15.00	0.00	650	681	740	796
SMICHAEL	Michael, Seth							
09/03/2015	80	22	10.00	0.00	531	541	588	632
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**5**		**Min:**	**531**	**541**	**588**	**632**
				Max:	**650**	**681**	**740**	**796**
				Avg:	**603**	**612**	**668**	**720**

715 **E NORTH SHORE LN** **AMERICAN** **B62B**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	70	28	16.00	0.00	671	737	814	884
	<No Staff Member Listed>							
09/20/2012	78	25	22.00	0.00	787	826	900	970
JGERNNS	Gernns, Joshua							
10/14/2013	75	25	22.00	0.00	0	0	0	0
BHERMENET	Hermenet, Brandon							
06/06/2014	75	30	20.00	0.00	0	0	0	0
CTYLER	Tyler, Caleb N							
09/03/2015	79	30	20.00	0.00	750	829	902	971
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**5**		**Min:**	**0**	**0**	**0**	**0**
				Max:	**787**	**829**	**902**	**971**
				Avg:	**441**	**478**	**523**	**565**

716 34325 N LIMEKILN RD AMERICAN B62B

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	65	30	30.00	0.00	919	1053	1173	1284
	<No Staff Member Listed>							
09/20/2012	64	25	22.00	0.00	787	840	938	1028
JGERNNS	Gernns, Joshua							
10/14/2013	65	25	20.00	0.00	750	799	891	975
BHERMENET	Hermenet, Brandon							
06/06/2014	60	30	26.00	0.00	856	1000	1128	1245
CTYLER	Tyler, Caleb N							
06/06/2014	80	40	36.00	0.00	1007	1253	1362	1464
CTYLER	Tyler, Caleb N							
06/11/2015	70	40	18.00	0.00	712	938	1035	1125
MCONNER	Conner, Matthew							
Subtotal Flow Tests:		**6**		**Min:**	**712**	**799**	**891**	**975**
				Max:	**1007**	**1253**	**1362**	**1464**
				Avg:	**838**	**980**	**1087**	**1186**

717 17105 CAPE HORN DR AMERICAN B62B

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	38	10	8.00	0.00	475	374	475	560
	<No Staff Member Listed>							
09/20/2012	41	11	11.00	0.00	557	459	567	659
JGERNNS	Gernns, Joshua							
10/08/2013	30	0	8.00	0.00	475	262	382	475
BHATHAWAY	Hathaway, Brad							
06/06/2014	46	12	8.00	0.00	475	411	490	559
CTYLER	Tyler, Caleb N							
06/11/2015	50	20	15.00	0.00	650	650	759	856
MCONNER	Conner, Matthew							
Subtotal Flow Tests:		**5**		**Min:**	**475**	**262**	**382**	**475**
				Max:	**650**	**650**	**759**	**856**
				Avg:	**526**	**431**	**534**	**621**

718 N LIMEKILN RD /BITTEREND MARINA AMERICAN B62BQ

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	80	48	45.00	0.00	1126	1581	1718	1847
	<No Staff Member Listed>							
09/20/2012	80	38	30.00	0.00	919	1114	1211	1301
JGERNNS	Gernns, Joshua							
10/14/2013	83	35	32.00	0.00	949	1099	1190	1276
JBRODIN	Brodin, Justin							
09/03/2015	70	28	15.00	0.00	650	714	788	856
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**4**		**Min:**	**650**	**714**	**788**	**856**
				Max:	**1126**	**1581**	**1718**	**1847**
				Avg:	**911**	**1127**	**1226**	**1320**

719 N LIMEKILN RD /SCENIC BAY MARINA AMERICAN B62B

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	98	70	60.00	0.00	1300	2261	2413	2557
	<No Staff Member Listed>							
09/20/2012	95	55	45.00	0.00	1126	1581	1692	1796
JGERNNS	Gernns, Joshua							
10/14/2013	95	55	50.00	0.00	1186	1665	1782	1892
JBRODIN	Brodin, Justin							
06/06/2014	92	54	40.00	0.00	1061	1498	1607	1710
CTYLER	Tyler, Caleb N							
09/03/2015	100	62	35.00	0.00	993	1484	1582	1674
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**5**		**Min:**	**993**	**1484**	**1582**	**1674**
				Max:	**1300**	**2261**	**2413**	**2557**
				Avg:	**1133**	**1697**	**1815**	**1925**

*** Scheduled Flow Test**

720 N LIMEKILN RD & E PIER RD AMERICAN

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	85	52	45.00	0.00	1126	1624	1754	1877
	<No Staff Member Listed>							
09/20/2012	78	40	35.00	0.00	993	1248	1360	1464
JGERNNS	Gernns, Joshua							
10/14/2013	85	45	42.00	0.00	1087	1413	1526	1633
107	Kaplan, Andrew							
06/06/2014	92	50	35.00	0.00	993	1328	1425	1516
CTYLER	Tyler, Caleb N							
Subtotal Flow Tests:	**4**			**Min:**	**993**	**1248**	**1360**	**1464**
				Max:	**1126**	**1624**	**1754**	**1877**
				Avg:	**1049**	**1403**	**1516**	**1622**

721 N COTTONWOOD CT & CAPE HORN DR WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	60	20	12.00	0.00	581	581	655	723
	<No Staff Member Listed>							
09/20/2012	58	22	16.00	0.00	671	691	784	868
JGERNNS	Gernns, Joshua							
10/14/2013	55	20	12.00	0.00	581	581	665	742
JBRODIN	Brodin, Justin							
06/11/2015	60	25	20.00	0.00	750	806	909	1003
MCONNER	Conner, Matthew							
Subtotal Flow Tests:	**4**			**Min:**	**581**	**581**	**655**	**723**
				Max:	**750**	**806**	**909**	**1003**
				Avg:	**645**	**664**	**753**	**834**

722 34317 W MAIN AVE & N BARDILL ST AMERICAN

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	60	28	15.00	0.00	650	733	827	913
	<No Staff Member Listed>							
09/20/2012	58	22	22.00	0.00	787	810	919	1018
JGERNNS	Gernns, Joshua							

*** Scheduled Flow Test**

722 **34317 W MAIN AVE & N BARDILL ST** **AMERICAN**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
10/14/2013	70	28	25.00	0.00	839	922	1017	1106
JBRODIN	Brodin, Justin							
05/31/2014	70	28	20.00	0.00	750	824	909	988
CTYLER	Tyler, Caleb N							
Subtotal Flow Tests:		**4**		**Min:**	**650**	**733**	**827**	**913**
				Max:	**839**	**922**	**1017**	**1106**
				Avg:	**756**	**822**	**918**	**1006**

723 **16205 N CHEROKEE RD & E PERIMETER RD** **AMERICAN**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	55	15	15.00	0.00	650	605	693	772
	<No Staff Member Listed>							
09/20/2012	54	14	14.00	0.00	628	575	661	738
JGERNNS	Gernns, Joshua							
10/14/2013	50	15	12.00	0.00	581	535	624	704
JBRODIN	Brodin, Justin							
05/31/2014	50	18	25.00	0.00	839	810	946	1068
CTYLER	Tyler, Caleb N							
Subtotal Flow Tests:		**4**		**Min:**	**581**	**535**	**624**	**704**
				Max:	**839**	**810**	**946**	**1068**
				Avg:	**674**	**631**	**731**	**820**

724 **W MAIN AVE & E 5TH ST** **AMERICAN**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	90	60	52.00	0.00	1210	1912	2055	2190
	<No Staff Member Listed>							
09/20/2012	90	52	45.00	0.00	1126	1566	1683	1794
JGERNNS	Gernns, Joshua							
10/14/2013	92	55	50.00	0.00	1186	1699	1823	1940
JBRODIN	Brodin, Justin							
05/31/2014	98	80	40.00	0.00	1061	2342	2500	2649
CTYLER	Tyler, Caleb N							

724 W MAIN AVE & E 5TH ST AMERICAN

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
Subtotal Flow Tests:		**4**		**Min:**	**1061**	**1566**	**1683**	**1794**
				Max:	**1210**	**2342**	**2500**	**2649**
				Avg:	**1145**	**1879**	**2015**	**2143**

726 16415 E 4TH ST & N PEND OREILLE DR AMERICAN 1978

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	65	20	20.00	0.00	750	750	836	915
	<No Staff Member Listed>							
09/25/2012	65	25	20.00	0.00	750	799	891	975
JGERNNS	Gernns, Joshua							
10/14/2013	65	35	20.00	0.00	750	934	1040	1139
BHERMENET	Hermenet, Brandon							
05/31/2014	75	50	20.00	0.00	750	1148	1256	1357
SMICHAEL	Michael, Seth							
Subtotal Flow Tests:		**4**		**Min:**	**750**	**750**	**836**	**915**
				Max:	**750**	**1148**	**1256**	**1357**
				Avg:	**750**	**907**	**1005**	**1096**

727 E HUDSON BAY RD & N STUBS ST WATEROUS

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	82	58	45.00	0.00	1126	1880	2038	2186
	<No Staff Member Listed>							
09/25/2012	82	55	25.00	0.00	839	1314	1425	1529
JGERNNS	Gernns, Joshua							
10/08/2013	80	50	40.00	0.00	1061	1543	1677	1802
107	Kaplan, Andrew							
06/01/2014	88	60	45.00	0.00	1126	1818	1958	2090
SMICHAEL	Michael, Seth							
Subtotal Flow Tests:		**4**		**Min:**	**839**	**1314**	**1425**	**1529**
				Max:	**1126**	**1880**	**2038**	**2186**
				Avg:	**1038**	**1638**	**1774**	**1901**

728 E HUDSON BAY RD & N STUBS ST WATEROUS

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	82	60	50.00	0.00	1186	2075	2250	2413
	<No Staff Member Listed>							
09/25/2012	86	60	40.00	0.00	1061	1755	1894	2024
JGERNNS	Gernns, Joshua							
10/08/2013	80	60	42.00	0.00	1087	1967	2138	2298
BHATHAWAY	Hathaway, Brad							
06/01/2014	90	62	40.00	0.00	1061	1740	1870	1993
CTYLER	Tyler, Caleb N							
06/06/2014	90	62	40.00	0.00	1061	1740	1870	1993
	<No Staff Member Listed>							
Subtotal Flow Tests:		**5**		**Min:**	**1061**	**1740**	**1870**	**1993**
				Max:	**1186**	**2075**	**2250**	**2413**
				Avg:	**1091**	**1855**	**2004**	**2144**

729 17035 E HUDSON BAY RD AMERICAN

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	76	38	30.00	0.00	919	1133	1238	1336
	<No Staff Member Listed>							
09/25/2012	72	42	32.00	0.00	949	1277	1404	1523
JGERNNS	Gernns, Joshua							
10/08/2013	75	38	35.00	0.00	993	1230	1346	1454
JBRODIN	Brodin, Justin							
Subtotal Flow Tests:		**3**		**Min:**	**919**	**1133**	**1238**	**1336**
				Max:	**993**	**1277**	**1404**	**1523**
				Avg:	**953**	**1213**	**1329**	**1437**

730 17451 E HUDSON BAY RD AMERICAN

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	75	25	20.00	0.00	750	790	864	934
	<No Staff Member Listed>							
09/25/2012	78	36	28.00	0.00	888	1057	1152	1240
JGERNNS	Gernns, Joshua							

730 17451 E HUDSON BAY RD AMERICAN

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
10/08/2013	75	30	35.00	0.00	993	1107	1211	1308
BHERMENET	Hermenet, Brandon							
06/01/2014	85	35	30.00	0.00	919	1059	1144	1224
	<No Staff Member Listed>							
06/06/2014	85	35	30.00	0.00	919	1059	1144	1224
	<No Staff Member Listed>							
Subtotal Flow Tests:		**5**		**Min:**	**750**	**790**	**864**	**934**
				Max:	**993**	**1107**	**1211**	**1308**
				Avg:	**893**	**1014**	**1103**	**1186**

731 17245 E HUDSON BAY RD AMERICAN

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	60	30	20.00	0.00	750	876	988	1090
	<No Staff Member Listed>							
09/25/2012	78	28	22.00	0.00	787	853	929	1001
JGERNNS	Gernns, Joshua							
10/08/2013	80	25	25.00	0.00	839	879	956	1027
BHERMENET	Hermenet, Brandon							
06/01/2014	75	25	25.00	0.00	839	883	967	1044
CTYLER	Tyler, Caleb N							
06/06/2014	75	25	20.00	0.00	750	790	864	934
	<No Staff Member Listed>							
Subtotal Flow Tests:		**5**		**Min:**	**750**	**790**	**864**	**934**
				Max:	**839**	**883**	**988**	**1090**
				Avg:	**793**	**856**	**940**	**1019**

732 E HUDSON BAY RD /END OF THE RD. AMERICAN

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	70	20	18.00	0.00	712	712	786	854
	<No Staff Member Listed>							
09/25/2012	58	20	20.00	0.00	750	750	851	942
JGERNNS	Gernns, Joshua							

732 E HUDSON BAY RD /END OF THE RD. AMERICAN

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
10/08/2013	62	15	17.00	0.00	692	651	731	804
BHERMENET	Hermenet, Brandon							
Subtotal Flow Tests:		**3**		**Min:**	**692**	**651**	**731**	**804**
				Max:	**750**	**750**	**851**	**942**
				Avg:	**718**	**704**	**789**	**866**

737 CAPE HORN DR & N RAVEN PL WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	80	55	35.00	0.00	993	1593	1731	1861
	<No Staff Member Listed>							
09/18/2012	80	65	40.00	0.00	1061	2243	2438	2620
EFOTI	Foti, Eric A							
10/08/2013	80	37	60.00	0.00	1300	1556	1691	1818
JBRODIN	Brodin, Justin							
06/07/2014	90	60	35.00	0.00	993	1569	1686	1797
SMICHAEL	Michael, Seth							
06/05/2015	84	48	38.00	0.00	1034	1411	1526	1634
BBURROW	Burrow, Byron							
Subtotal Flow Tests:		**5**		**Min:**	**993**	**1411**	**1526**	**1634**
				Max:	**1300**	**2243**	**2438**	**2620**
				Avg:	**1076**	**1674**	**1814**	**1946**

738 N RAVEN PL /BOTTOM OF HILL WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	125	58	40.00	0.00	1061	1352	1420	1486
	<No Staff Member Listed>							
09/18/2012	130	82	55.00	0.00	1244	1947	2040	2130
EFOTI	Foti, Eric A							
10/08/2013	130	95	72.00	0.00	1424	2643	2770	2892
JBRODIN	Brodin, Justin							
06/07/2014	135	92	60.00	0.00	1300	2211	2313	2411
SMICHAEL	Michael, Seth							

738 N RAVEN PL /BOTTOM OF HILL WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
06/05/2015	120	70	40.00	0.00	1061	1543	1624	1702
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**5**		**Min:**	**1061**	**1352**	**1420**	**1486**
				Max:	**1424**	**2643**	**2770**	**2892**
				Avg:	**1218**	**1939**	**2033**	**2124**

739 34155 N PEND OREILLE DR & N PINE AVE WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	128	65	45.00	0.00	1126	1506	1580	1651
	<No Staff Member Listed>							
09/18/2012	125	75	45.00	0.00	1126	1681	1766	1847
EFOTI	Foti, Eric A							
10/08/2013	125	75	55.00	0.00	1244	1857	1951	2040
JBRODIN	Brodin, Justin							
06/07/2014	135	90	50.00	0.00	1186	1968	2059	2146
SMICHAEL	Michael, Seth							
06/05/2015	136	80	45.00	0.00	1126	1668	1745	1818
BBURROW	Burrow, Byron							
Subtotal Flow Tests:		**5**		**Min:**	**1126**	**1506**	**1580**	**1651**
				Max:	**1244**	**1968**	**2059**	**2146**
				Avg:	**1161**	**1736**	**1820**	**1900**

740 20104 CAPE HORN DR & N TERRACE DR WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	80	60	40.00	0.00	1061	1920	2087	2243
	<No Staff Member Listed>							
09/18/2012	88	72	55.00	0.00	1244	2717	2926	3123
EFOTI	Foti, Eric A							
10/08/2013	80	65	45.00	0.00	1126	2380	2587	2780
JBRODIN	Brodin, Justin							
06/07/2014	90	60	40.00	0.00	1061	1677	1802	1920
SMICHAEL	Michael, Seth							

740 20104 CAPE HORN DR & N TERRACE DR WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
06/05/2015	90	66	40.00	0.00	1061	1891	2033	2166
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**5**		**Min:**	**1061**	**1677**	**1802**	**1920**
				Max:	**1244**	**2717**	**2926**	**3123**
				Avg:	**1110**	**2117**	**2287**	**2446**

741 20572 CAPE HORN DR WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	130	85	60.00	0.00	1300	2106	2208	2305
	<No Staff Member Listed>							
09/18/2012	130	90	55.00	0.00	1244	2148	2251	2351
EFOTI	Foti, Eric A							
10/08/2013	125	110	80.00	0.00	1501	4293	4509	4717
BHERMENET	Hermenet, Brandon							
07/13/2014	130	80	60.00	0.00	1300	1990	2086	2178
SMICHAEL	Michael, Seth							
06/05/2015	130	55	94.00	0.00	1627	2001	2097	2190
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**5**		**Min:**	**1244**	**1990**	**2086**	**2178**
				Max:	**1627**	**4293**	**4509**	**4717**
				Avg:	**1394**	**2507**	**2630**	**2748**

742 20400 CAPE HORN DR & E LOWER CAPE HORN RD WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	110	70	50.00	0.00	1186	1838	1945	2048
	<No Staff Member Listed>							
09/18/2012	118	90	55.00	0.00	1244	2447	2579	2705
EFOTI	Foti, Eric A							
10/08/2013	115	80	60.00	0.00	1300	2229	2353	2471
BHATHAWAY	Hathaway, Brad							
07/13/2014	100	80	60.00	0.00	1300	2748	2929	3100
SMICHAEL	Michael, Seth							

742 20400 CAPE HORN DR & E LOWER CAPE HORN RD WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
06/05/2015	124	80	55.00	0.00	1244	1979	2080	2177
BBURROW	Burrow, Byron							
Subtotal Flow Tests:		**5**		**Min:**	**1186**	**1838**	**1945**	**2048**
				Max:	**1300**	**2748**	**2929**	**3100**
				Avg:	**1254**	**2248**	**2377**	**2500**

743 34396 CAPE HORN DR WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	98	62	45.00	0.00	1126	1709	1825	1934
	<No Staff Member Listed>							
09/18/2012	90	60	45.00	0.00	1126	1779	1912	2038
EFOTI	Foti, Eric A							
10/08/2013	95	60	42.00	0.00	1087	1640	1755	1864
JBRODIN	Brodin, Justin							
07/13/2014	100	60	40.00	0.00	1061	1543	1644	1740
	<No Staff Member Listed>							
06/05/2015	100	70	40.00	0.00	1061	1802	1920	2033
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**5**		**Min:**	**1061**	**1543**	**1644**	**1740**
				Max:	**1126**	**1802**	**1920**	**2038**
				Avg:	**1092**	**1694**	**1811**	**1921**

744 34216 N FLATTERY RD WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	115	72	50.00	0.00	1186	1820	1921	2017
	<No Staff Member Listed>							
09/18/2012	118	70	50.00	0.00	1186	1744	1838	1928
EFOTI	Foti, Eric A							
10/08/2013	120	90	65.00	0.00	1353	2592	2729	2860
107	Kaplan, Andrew							
06/07/2014	128	85	50.00	0.00	1186	1950	2046	2137
SMICHAEL	Michael, Seth							

TLFD

Hydrant Flow Test By Hydrant

District = "01   "

744   34216 N FLATTERY RD   WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
06/05/2015	120	70	40.00	0.00	1061	1543	1624	1702
BRENNISON	Rennison, Brett							

Subtotal Flow Tests:	**5**	**Min:**	**1061**	**1543**	**1624**	**1702**
		Max:	**1353**	**2592**	**2729**	**2860**
		Avg:	**1194**	**1929**	**2031**	**2128**

745   18982 E SLIDE BAY RD   WATEROUS 2002

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	115	65	65.00	0.00	1353	1913	2020	2121
	<No Staff Member Listed>							
09/18/2012	118	62	45.00	0.00	1126	1523	1605	1684
EFOTI	Foti, Eric A							
10/14/2013	15	70	55.00	0.00	1244	0	0	0
107	Kaplan, Andrew							
06/07/2014	125	65	45.00	0.00	1126	1523	1600	1674
SMICHAEL	Michael, Seth							
07/23/2015	122	62	40.00	0.00	1061	1413	1486	1556
BRENNISON	Rennison, Brett							

Subtotal Flow Tests:	**5**	**Min:**	**1061**	**0**	**0**	**0**
		Max:	**1353**	**1913**	**2020**	**2121**
		Avg:	**1182**	**1274**	**1342**	**1407**

746   E HUDSON BAY RD   WATEROUS 2007

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	60	20	12.00	0.00	581	581	655	723
	<No Staff Member Listed>							

Subtotal Flow Tests:	**1**	**Min:**	**581**	**581**	**655**	**723**
		Max:	**581**	**581**	**655**	**723**
		Avg:	**581**	**581**	**655**	**723**

TLFD

Hydrant Flow Test By Hydrant

District = "01   "

747 — 18284 E HUDSON BAY RD — WATEROUS — 2007

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	65	18	10.00	0.00	531	519	578	633
	<No Staff Member Listed>							

Subtotal Flow Tests:	**1**	**Min:**	**531**	**519**	**578**	**633**
		Max:	**531**	**519**	**578**	**633**
		Avg:	**531**	**519**	**578**	**633**

748 — E HUDSON BAY RD — WATEROUS — 2007

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	60	20	10.00	0.00	531	531	599	661
	<No Staff Member Listed>							

Subtotal Flow Tests:	**1**	**Min:**	**531**	**531**	**599**	**661**
		Max:	**531**	**531**	**599**	**661**
		Avg:	**531**	**531**	**599**	**661**

749 — E HUDSON BAY RD — WATEROUS — 2007

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	100	20	10.00	0.00	531	531	566	599
	<No Staff Member Listed>							

Subtotal Flow Tests:	**1**	**Min:**	**531**	**531**	**566**	**599**
		Max:	**531**	**531**	**566**	**599**
		Avg:	**531**	**531**	**566**	**599**

750 — E HUDSON BAY RD — WATEROUS — 2007

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	100	40	20.00	0.00	750	876	934	988
	<No Staff Member Listed>							

Subtotal Flow Tests:	**1**	**Min:**	**750**	**876**	**934**	**988**
		Max:	**750**	**876**	**934**	**988**
		Avg:	**750**	**876**	**934**	**988**

*** Scheduled Flow Test**

TLFD

Hydrant Flow Test By Hydrant

District = "01   "

751	E WALLER RD					WATEROUS	250	
Date	**Static**	**Residual**	**Pitot**	**Pitot 2**	**GPM**	**20 PSI**	**10 PSI**	**0 PSI**
09/01/2010	50	20	12.00	0.00	581	581	679	766
	<No Staff Member Listed>							
09/20/2012	55	18	13.00	0.00	605	587	672	749
JGERNNS	Gernns, Joshua							
10/14/2013	42	12	5.00	0.00	375	317	388	450
107	Kaplan, Andrew							
05/31/2014	60	20	10.00	0.00	531	531	599	661
CTYLER	Tyler, Caleb N							
06/11/2015	70	24	15.00	0.00	650	680	750	815
MCONNER	Conner, Matthew							
Subtotal Flow Tests:		**5**		**Min:**	**375**	**317**	**388**	**450**
				Max:	**650**	**680**	**750**	**815**
				Avg:	**548**	**539**	**617**	**688**

752	E WALLER RD					WATEROUS	250	
Date	**Static**	**Residual**	**Pitot**	**Pitot 2**	**GPM**	**20 PSI**	**10 PSI**	**0 PSI**
09/01/2010	40	5	0.00	0.00	0	0	0	0
	<No Staff Member Listed>							
09/20/2012	40	10	10.00	0.00	531	427	531	620
JGERNNS	Gernns, Joshua							
10/14/2013	55	50	10.00	0.00	531	1519	1739	1938
JBRODIN	Brodin, Justin							
05/31/2014	50	15	0.00	0.00	0	0	0	0
CTYLER	Tyler, Caleb N							
06/11/2015	50	18	10.00	0.00	531	513	599	676
MCONNER	Conner, Matthew							
Subtotal Flow Tests:		**5**		**Min:**	**0**	**0**	**0**	**0**
				Max:	**531**	**1519**	**1739**	**1938**
				Avg:	**318**	**491**	**573**	**646**

*** Scheduled Flow Test**

753 W MAIN AVE MH 2009

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	85	64	50.00	0.00	1186	2183	2358	2523
	<No Staff Member Listed>							
10/04/2012	88	30	60.00	0.00	1300	1417	1526	1628
JGERNNS	Gernns, Joshua							
Subtotal Flow Tests:		**2**		**Min:**	**1186**	**1417**	**1526**	**1628**
				Max:	**1300**	**2183**	**2358**	**2523**
				Avg:	**1243**	**1800**	**1942**	**2075**

754 E 5TH ST MH 2009

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	82	55	48.00	0.00	1163	1822	1975	2119
	<No Staff Member Listed>							
10/04/2012	82	30	44.00	0.00	1113	1224	1327	1423
JGERNNS	Gernns, Joshua							
Subtotal Flow Tests:		**2**		**Min:**	**1113**	**1224**	**1327**	**1423**
				Max:	**1163**	**1822**	**1975**	**2119**
				Avg:	**1138**	**1523**	**1651**	**1771**

755 N TERRACE DR WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	60	40	25.00	0.00	839	1220	1376	1518
	<No Staff Member Listed>							
06/05/2015	68	50	28.00	0.00	888	1508	1670	1820
BBURROW	Burrow, Byron							
Subtotal Flow Tests:		**2**		**Min:**	**839**	**1220**	**1376**	**1518**
				Max:	**888**	**1508**	**1670**	**1820**
				Avg:	**863**	**1364**	**1523**	**1669**

756 CAPE HORN DR /CAPE HORN CIRCLE WATEROUS 2002

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	85	55	40.00	0.00	1061	1611	1740	1862
	<No Staff Member Listed>							

Subtotal Flow Tests:	**1**	**Min:**	**1061**	**1611**	**1740**	**1862**
		Max:	**1061**	**1611**	**1740**	**1862**
		Avg:	**1061**	**1611**	**1740**	**1862**

757 E 5TH ST & E HIGHWAY 54

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
10/14/2013	87	47	40.00	0.00	1061	1402	1511	1614
	<No Staff Member Listed>							
05/31/2014	90	50	40.00	0.00	1061	1435	1543	1644
CTYLER	Tyler, Caleb N							

Subtotal Flow Tests:	**2**	**Min:**	**1061**	**1402**	**1511**	**1614**
		Max:	**1061**	**1435**	**1543**	**1644**
		Avg:	**1061**	**1418**	**1527**	**1629**

758 E HIGHWAY 54

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
10/05/2013	0	0	0.00	0.00	0	0	0	0
	<No Staff Member Listed>							
05/31/2014	90	70	20.00	0.00	750	1475	1586	1690
CTYLER	Tyler, Caleb N							

Subtotal Flow Tests:	**2**	**Min:**	**0**	**0**	**0**	**0**
		Max:	**750**	**1475**	**1586**	**1690**
		Avg:	**375**	**737**	**793**	**845**

759 E SLIDE BAY RD & N JEEPSTER RD WATEROUS 250

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
07/23/2015	130	80	45.00	0.00	1126	1724	1807	1886
BRENNISON	Rennison, Brett							

759 **E SLIDE BAY RD & N JEEPSTER RD** **WATEROUS** **250**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
Subtotal Flow Tests:		**1**		**Min:**	**1126**	**1724**	**1807**	**1886**
				Max:	**1126**	**1724**	**1807**	**1886**
				Avg:	**1126**	**1724**	**1807**	**1886**

760 **E DUWAMISH DR & CAPE HORN DR** **AMERICAN** **B62B**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
07/23/2015	40	18	10.00	0.00	531	504	628	733
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**1**		**Min:**	**531**	**504**	**628**	**733**
				Max:	**531**	**504**	**628**	**733**
				Avg:	**531**	**504**	**628**	**733**

800 **CAPE HORN DR & GRANDVIEW LN** **KENNEDY** **150**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	100	58	45.00	0.00	1126	1595	1699	1799
	<No Staff Member Listed>							
09/18/2012	100	50	40.00	0.00	1061	1368	1457	1543
EFOTI	Foti, Eric A							
09/18/2012	100	50	40.00	0.00	1061	1368	1457	1543
EFOTI	Foti, Eric A							
10/08/2013	95	50	40.00	0.00	1061	1398	1496	1588
JBRODIN	Brodin, Justin							
07/13/2014	100	55	40.00	0.00	1061	1448	1543	1633
CTYLER	Tyler, Caleb N							
Subtotal Flow Tests:		**5**		**Min:**	**1061**	**1368**	**1457**	**1543**
				Max:	**1126**	**1595**	**1699**	**1799**
				Avg:	**1074**	**1435**	**1530**	**1621**

801 CAPE HORN DR & GLACIER LOOP KENNEDY 150

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	95	52	45.00	0.00	1126	1521	1627	1728
	<No Staff Member Listed>							
09/18/2012	90	40	30.00	0.00	919	1102	1185	1262
EFOTI	Foti, Eric A							
07/13/2014	100	50	25.00	0.00	839	1081	1152	1220
SMICHAEL	Michael, Seth							
06/05/2015	102	58	40.00	0.00	1061	1485	1580	1671
BBURROW	Burrow, Byron							
Subtotal Flow Tests:		**4**		**Min:**	**839**	**1081**	**1152**	**1220**
				Max:	**1126**	**1521**	**1627**	**1728**
				Avg:	**986**	**1297**	**1386**	**1470**

802 457 CAPE HORN DR WATEROUS 150

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	85	50	35.00	0.00	993	1387	1499	1603
	<No Staff Member Listed>							
09/18/2012	82	52	35.00	0.00	993	1470	1593	1709
EFOTI	Foti, Eric A							
10/08/2013	80	48	40.00	0.00	1061	1490	1619	1740
JBRODIN	Brodin, Justin							
07/13/2014	90	60	40.00	0.00	1061	1677	1802	1920
SMICHAEL	Michael, Seth							
06/05/2015	88	58	35.00	0.00	993	1545	1664	1776
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**5**		**Min:**	**993**	**1387**	**1499**	**1603**
				Max:	**1061**	**1677**	**1802**	**1920**
				Avg:	**1020**	**1513**	**1635**	**1749**

TLFD

Hydrant Flow Test By Hydrant

District = "01 "

803 **842 GLACIER LOOP /AT THE Y** **WATEROUS** **250**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	115	6	45.00	0.00	1126	1045	1103	1159
	<No Staff Member Listed>							
09/18/2012	105	60	45.00	0.00	1126	1587	1686	1779
EFOTI	Foti, Eric A							
10/08/2013	100	50	40.00	0.00	1061	1368	1457	1543
BHERMENET	Hermenet, Brandon							
07/13/2014	110	80	50.00	0.00	1186	2146	2272	2392
CTYLER	Tyler, Caleb N							
06/05/2015	92	50	35.00	0.00	993	1328	1425	1516
BRENNISON	Rennison, Brett							
Subtotal Flow Tests:		**5**		**Min:**	**993**	**1045**	**1103**	**1159**
				Max:	**1186**	**2146**	**2272**	**2392**
				Avg:	**1098**	**1494**	**1588**	**1677**

804 **422 GLACIER LOOP** **WATEROUS** **150**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	38	10	3.00	0.00	291	229	291	343
	<No Staff Member Listed>							
09/18/2012	34	9	7.00	0.00	444	325	434	524
EFOTI	Foti, Eric A							
10/08/2013	35	10	8.00	0.00	475	360	475	570
107	Kaplan, Andrew							
07/13/2014	95	60	35.00	0.00	993	1499	1603	1703
SMICHAEL	Michael, Seth							
Subtotal Flow Tests:		**4**		**Min:**	**291**	**229**	**291**	**343**
				Max:	**993**	**1499**	**1603**	**1703**
				Avg:	**550**	**603**	**700**	**785**

*** Scheduled Flow Test**

805 **635 GLACIER LOOP** **WATEROUS** **150**

Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	90	48	35.00	0.00	993	1308	1406	1499
	<No Staff Member Listed>							
09/18/2012	95	45	40.00	0.00	1061	1321	1413	1501
EFOTI	Foti, Eric A							
10/08/2013	85	45	35.00	0.00	993	1291	1394	1492
JBRODIN	Brodin, Justin							
07/13/2014	90	60	40.00	0.00	1061	1677	1802	1920
CTYLER	Tyler, Caleb N							
06/05/2015	100	30	20.00	0.00	750	806	859	909
BBURROW	Burrow, Byron							
Subtotal Flow Tests:		**5**		**Min:**	**750**	**806**	**859**	**909**
				Max:	**1061**	**1677**	**1802**	**1920**
				Avg:	**971**	**1280**	**1374**	**1464**

900 **11585 E SIMS LN** **WATEROUS** **250**

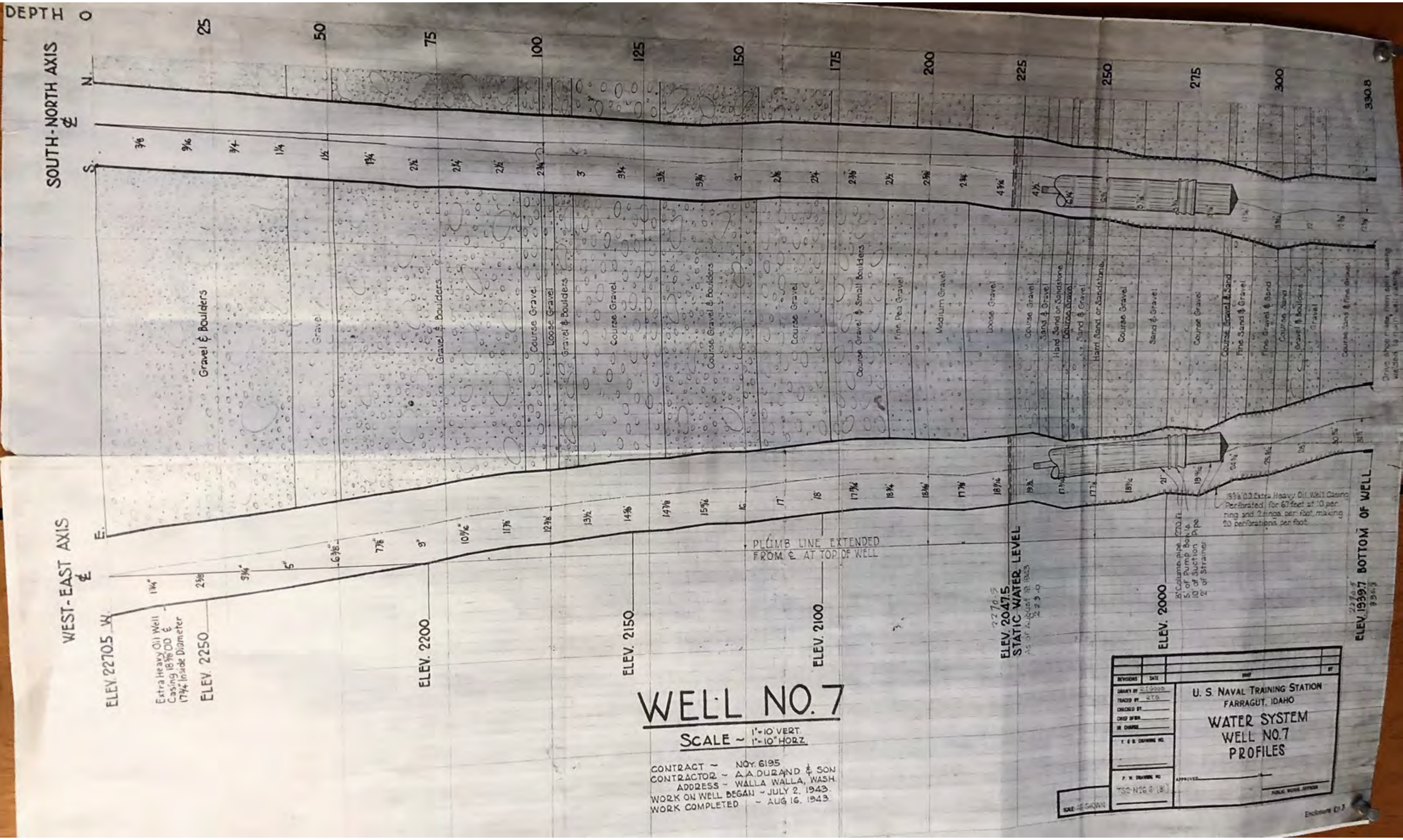
Date	Static	Residual	Pitot	Pitot 2	GPM	20 PSI	10 PSI	0 PSI
09/01/2010	70	38	25.00	0.00	839	1068	1178	1280
	<No Staff Member Listed>							
09/12/2012	50	20	15.00	0.00	650	650	759	856
BHERMENET	Hermenet, Brandon							
10/06/2013	70	20	20.00	0.00	750	750	828	899
EFOTI	Foti, Eric A							
05/30/2014	70	22	18.00	0.00	712	728	803	873
JBRODIN	Brodin, Justin							
08/03/2015	68	30	22.00	0.00	787	893	989	1078
KWRIGHT	Wright, Kody							
Subtotal Flow Tests:		**5**		**Min:**	**650**	**650**	**759**	**856**
				Max:	**839**	**1068**	**1178**	**1280**
				Avg:	**747**	**817**	**911**	**997**

*** Scheduled Flow Test**

Appendix 2-E

Groundwater Water Right Information

THIS PAGE WAS INTENTIONALLY LEFT BLANK


DEPTH 0
25
50
75
100
125
150
175
200
225
250
275
300
330.8
SOUTH-NORTH AXIS ℄
S.
N.
WEST-EAST AXIS ℄
W.
E.
ELEV. 2270.5
Extra Heavy Oil Well Casing 18⅝" OD & 17¾" Inside Diameter
ELEV. 2250
ELEV. 2200
ELEV. 2150
ELEV. 2100
ELEV. 2047.5
STATIC WATER LEVEL
As of August 18, 1943
ELEV. 2000
ELEV. 1939.7 BOTTOM OF WELL
PLUMB LINE EXTENDED FROM ℄ AT TOP OF WELL
Gravel & Boulders
Gravel
Gravel & Boulders
Course Gravel
Loose Gravel
Gravel & Boulders
Course Gravel
Course Gravel & Boulders
Course Gravel
Course Gravel & Small Boulders
Fine Pea Gravel
Medium Gravel
Loose Gravel
Course Gravel
Sand & Gravel
Hard Sand or Sandstone
Course Gravel
Sand & Gravel
Hard Sand or Sandstone
Course Gravel
Sand & Gravel
Course Gravel
Course Gravel & Sand
Fine Sand & Gravel
Fine Gravel & Sand
Course Sand
Gravel & Boulders
Gravel
Course Sand & Fine Gravel
8" Column pipe 270 ft.
5' of Pump Bowls
10' of Suction Pipe
2' of Strainer
18⅝" O.D. Extra Heavy Oil Well Casing Perforated for 67 feet at 10 per ring and 2 rings per foot making 20 perforations per foot.
WELL NO. 7
SCALE ~ 1" = 10' VERT. 1" = 10' HORZ.
CONTRACT ~ NOy. 6195
CONTRACTOR ~ A. A. DURAND & SON
ADDRESS ~ WALLA WALLA, WASH.
WORK ON WELL BEGAN ~ JULY 2, 1943.
WORK COMPLETED ~ AUG 16, 1943.
U. S. NAVAL TRAINING STATION
FARRAGUT, IDAHO
WATER SYSTEM
WELL NO. 7
PROFILES

Close

IDAHO DEPARTMENT OF WATER RESOURCES
Water Right Report

9/19/2018

WATER RIGHT NO. 95-9880

Owner Type	Name and Address
Current Owner	BAYVIEW WATER & SEWER DISTRICT PO BOX 637 BAYVIEW, ID 83803-0637 2086833948

Priority Date: 07/17/1981
Basis: License
Status: Active

Source	Tributary
GROUND WATER	

Beneficial Use	From	To	Diversion Rate	Volume
IRRIGATION	3/15	11/15	1.67 CFS	504 AFA
COMMERCIAL	1/01	12/31	0.5 CFS	103.7 AFA
DOMESTIC	1/01	12/31	0.54 CFS	229.2 AFA
FIRE PROTECTION	1/01	12/31	1.67 CFS	
Total Diversion			1.67 CFS	

Location of Point(s) of Diversion:

GROUND WATER	SWNW	Sec. 03	Township 53N	Range 02W	KOOTENAI County

Place(s) of use:

Place of Use Legal Description: IRRIGATION KOOTENAI County

Township	**Range**	**Section**	**Lot**	**Tract**	**Acres**	**Lot**	**Tract**	**Acres**	**Lot**	**Tract**	**Acres**	**Lot**	**Tract**	**Acres**
53N	02W	2	1	NWNW	6	2	SENW	4						
		3	1	NENE	6	2	NWNE	6						
			3	NENW	16	4	NWNW	8						
54N		34	2	SWNE	20	1	SENE	3						
				SWNW	4		SENW	15						
			3	NESW	15		NWSW	15		SWSW	15	4	SESW	7
		35	4	SWNW	4									

Place of Use Legal Description:COMMERCIAL same as IRRIGATION

Place of Use Legal Description:DOMESTIC same as IRRIGATION

Place of Use Legal Description:FIRE PROTECTION same as IRRIGATION

Total Acres: 144

Dates:
Licensed Date: 08/19/1985
Decreed Date:
Enlargement Use Priority Date:
Enlargement Statute Priority Date:
Water Supply Bank Enrollment Date Accepted:
Water Supply Bank Enrollment Date Removed:
Application Received Date:
Protest Deadline Date:
Number of Protests: 0

Other Information:
State or Federal:
Owner Name Connector:
Water District Number:
Generic Max Rate per Acre:
Generic Max Volume per Acre:
Civil Case Number:
Old Case Number:
Decree Plantiff:

Decree Defendant:
Swan Falls Trust or Nontrust:
Swan Falls Dismissed:
DLE Act Number:
Cary Act Number:
Mitigation Plan: False

Close

Close

IDAHO DEPARTMENT OF WATER RESOURCES
Water Right Report

9/19/2018

WATER RIGHT NO. 95-9460

Owner Type	Name and Address
Current Owner	BAYVIEW WATER & SEWER DISTRICT PO BOX 637 BAYVIEW, ID 83803-0637 2086833948

Priority Date: 08/27/1998
Basis: License
Status: Active

Source	Tributary
GROUND WATER	

Beneficial Use	From	To	Diversion Rate	Volume
MUNICIPAL	01/01	12/31	1.7 CFS	731.4 AFA
FIRE PROTECTION	01/01	12/31	1.7 CFS	
Total Diversion			1.7 CFS	

Location of Point(s) of Diversion:

GROUND WATER	SWNW	Sec. 03	Township 53N	Range 02W	KOOTENAI County
GROUND WATER	NESW	Sec. 03	Township 53N	Range 02W	KOOTENAI County

Place(s) of use: Large POU Info

Conditions of Approval:

1.	004	The issuance of this right does not grant any right-of-way or easement across the land of another.
2.	180	A map depicting the place of use boundary for this water right at the time of this approval is attached to this document for illustration purposes.
3.	126	Place of use is within the service area of Bayview Water and Sewer District as provided for under Idaho law.
4.	174	This right authorizes the diversion of ground water within the Rathdrum Prairie Ground Water Management Area (RPGWMA). Use of water under this right shall be subject to the provisions of the management plan approved by the director for the RPGWMA.
5.	01M	After specific notification by the department, the right holder shall install a suitable measuring device or shall enter into an agreement with the department to determine the amount of water diverted from power records and shall annually report the information to the department.
6.	077	Water shall not be diverted for fire protection use under this right except to fight or repel an existing fire.

Dates:
Licensed Date: 02/15/2008
Decreed Date:
Permit Proof Due Date:
Permit Proof Made Date:
Permit Approved Date:
Permit Moratorium Expiration Date:
Enlargement Use Priority Date:
Enlargement Statute Priority Date:
Water Supply Bank Enrollment Date Accepted:
Water Supply Bank Enrollment Date Removed:
Application Received Date:
Protest Deadline Date:
Number of Protests: 0

Other Information:
State or Federal:
Owner Name Connector:
Water District Number:
Generic Max Rate per Acre:
Generic Max Volume per Acre:
Civil Case Number:
Old Case Number:
Decree Plantiff:
Decree Defendant:
Swan Falls Trust or Nontrust:
Swan Falls Dismissed:
DLE Act Number:
Cary Act Number:

Mitigation Plan: False

Close

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Appendix 2-F

Initial Structural Assessment – Farragut Reservoir

THIS PAGE WAS INTENTIONALLY LEFT BLANK

J·U·B ENGINEERS, INC.

J-U-B COMPANIES THE LANGDON GROUP GATEWAY MAPPING INC.

PROJECT MEMO

DATE: December 20, 2017

TO: Bayview Water and Sewer District, Bayview, ID

FROM: David L. Barnett, S.E.

PROJECT: Bayview Water Storage Reservoir

SUBJECT: Initial Structural Assessment

PROFESSIONAL ENGINEER REGISTERED 5785 STATE OF IDAHO DAVID LEWIS BARNETT

12/19/17

This memo is a summary of our observations and conclusions concerning the structural condition of the existing elevated water storage reservoir owned and operated by the Bayview Water and Sewer District (the District) and located on the grounds of Farragut State Park in Kootenai County, Idaho.

The reservoir structure is a cast-in-place, reinforced concrete standpipe, approximately 38-feet in diameter and 101-feet tall. The structure was built around 1942 as part of the Farragut Naval Training Station, which trained seamen for Naval service during World War II (WWII). At some time in the past, the reservoir was obtained by the Bayview Water and Sewer District and is currently operated as part of its municipal water supply system for the residents of the Bayview, ID area.

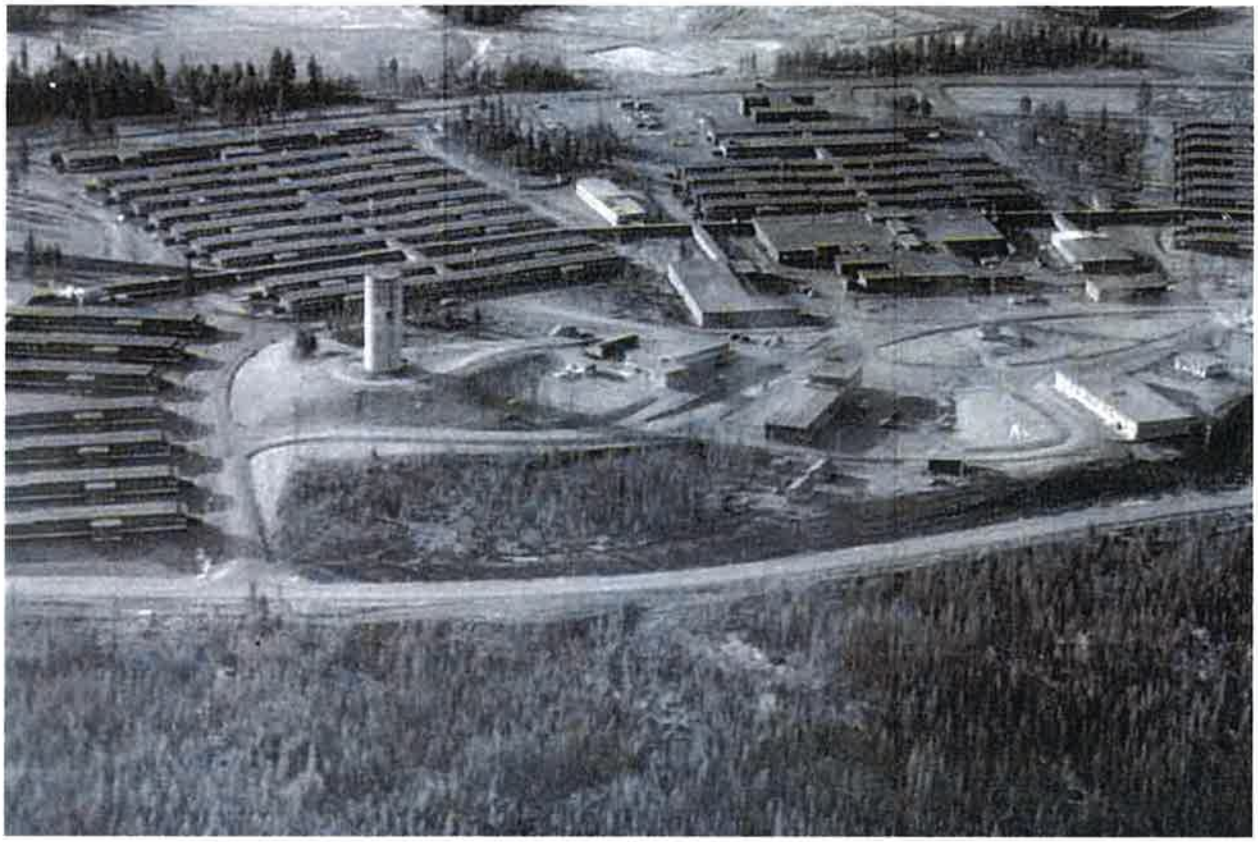
Approximately the top third of the standpipe is used for water storage with a concrete reservoir floor at the ⅔ level. The lower ⅔ of the standpipe is empty with the exceptions of the concrete support walls, pilasters, and struts; wooden access stair system; and piping and mechanical and electrical systems. The roof over the standpipe was originally of wood construction, but has since been replaced with a structural steel roof in the mid 1980s. **Figure 1** shows the standpipe in use sometime during WWII.

There are two concrete standpipes of similar construction located on the Farragut State Park grounds, which are operated by the Idaho Department of Parks and Recreation.

Though a records search was performed, no plans for the original construction of the standpipe were found. Plans for the replacement steel roof (J-U-B 1986) were obtained, as well as videos of recent underwater tank interior cleaning and inspection services performed on the tank.

Our review is based on: observations taken during a field inspection trip on December 14, 2017; the records noted above; and our knowledge of structural practices and codes at the time of construction.

Figure 1 – Reservoir in Use During WWII



Structural Conditions Observed

The overall condition of the structure is in fair or moderate condition. Most of the concrete support structure, up to the level of the tank bottom, appears to be in good condition. Some cracking and spalling on the concrete is evident, but it is not excessive for a structure of this age.

The cracking, leaking and accumulation of leachates on the concrete surfaces just below the floor of the tank itself is notable. Cracks and leaking can be seen both on the outside of the tank (**Figure 2**) and the inside of the tank (**Figure 3 Figure 4** and **Figure 5**). Small lime stalactites and thick lime accumulation can be observed on the underside of the tank floor, the support walls, and pilasters near the floor (**Figure 3** and **Figure 4**). It is likely that this cracking/leaking issue has been going on for quite some time – likely many decades.

What this leaking has done to the overall structural integrity of the reservoir is impossible to say, with any certainty. The amount, layout, and spacing of reinforcing steel within the structure is completely unknown at this time, as is its condition.

Items which are incidental, but necessary, and in poor condition include both the door to the outside upper platform and the outside upper platform itself. These represent a serious safety issue for personnel that must access the roof of the reservoir through the ladder mounted to the outside of the structure. The whole access system should be evaluated for compliance with current Occupational Safety and Health Administration (OSHA) safety codes.

Structural Condition Based on Age of Construction

Though building codes were in effect at the time of the reservoirs original construction, the need for specialized earthquake engineering was not adopted into building codes until the late 1950s or early 1960s. Therefore, it is likely that the structure was not specifically designed to resist the effects of a maximum expected local earthquake.

Reinforced concrete structures tend to have a degree of built-in inherent strength. The reservoir location is in a low seismic probability zone and though nothing is known about the tank's foundation, it is likely that it is founded on dense granular material, which is in its favor.

Current codes for reinforced concrete construction published by the American Concrete Institute (ACI) recognize the need for special detailing of reinforcing steel for water retaining structures used for municipal water and wastewater structures. The amount of steel provided in the tanks construction are likely quite low compared to what the ACI would recommend for new construction and is likely the reason for the observed cracking and leaking on the upper portions of the reservoir.

Conclusions and Recommendations

We are often asked "How long will my structure last?" or "What is the life expectancy of my structure?". There is no definitive answer to these questions as there are no established procedures to determine these types of numbers. On the one hand, there are concrete bridges and aqueducts built by the Romans that are over 2,000 years old and still in use today. On the other hand, we see poorly designed or constructed structures that last only a few years or decades.

This reservoir structure has been in operation about 75 years. Some would say it has "stood the test of time", but that says nothing about its remaining useful life. My opinion, after looking at the structure and its current condition, is that its useful life is about 100-years total. This gives the reservoir structure about 25 years remaining, assuming it is maintained properly from this point on.

The most serious issue in relation to long-term life of the reservoir is the cracking and leaking currently observed. A complete water-proof coating system should be applied to the inside of the tank in order to prevent further leaking. There are a number of products available to do this and a study should be started to investigate and select an appropriate product for this particular reservoir.

The access to the roof of the structure should be evaluated for compliance with current OSHA requirements and new and/or rehabilitated access provided accordingly. This study may find that both the interior stair system and the exterior ladder system are non-compliant.

For long-term planning, beyond the 25 years of expected remaining useful life for the reservoir structure, we recommend that the District investigate funding mechanisms to provide for the construction of a replacement storage reservoir, designed to meet current code requirements.

Figure 2 – Typical Tank Elevation View

Note: Staining on the upper third of the concrete walls is due to water seeping through cracks in the concrete structure.

Figure 3 – Lime Deposits and Leakage on the Underside of the Floor Supporting the Water

Figure 4 – Cracks with Small Stalactites Forming on the Bottom of the Tank Floor

Figure 5 – Water Seeping Down the Interior Face of the Reservoir Shaft

Figure 6 – Interior View of Access Stairs

Figure 7 – Access Ladder to Roof of Reservoir

Figure 8 – Reservoir Roof and Access Hatch

Appendix 2-G

Cross-Connection Control Resolution

THIS PAGE WAS INTENTIONALLY LEFT BLANK

RESOLUTION NO. 03-3

A RESOLUTION OF THE BAYVIEW WATER AND SEWER DISTRICT, KOOTENAI COUNTY, IDAHO, ESTABLISHING REGULATIONS FOR CROSS CONNECTION CONTROL

BE IT RESOLVED by the Board of Directors of the Bayview Water and Sewer District as follows:

Sections:

Section 1.0 Purpose. The purposes of this Resolution are to:

A. Protect the District Water System from the possibility of contamination or pollution by isolating, within customer systems, such contaminants or pollutants which could backflow or back-siphon into the District Water System; and

B. Provide for the maintenance of a continuing program for cross-connection control, which will systematically and effectively prevent the District's Water System from being compromised by any such contaminants or pollutants.

Section 2.0 Definitions. Whenever in this Resolution, or in any document governed by this Resolution, any of the following terms are used, said terms shall be defined as follows:

A. Approved. Accepted by the Board as meeting an applicable specification stated or cited in this Resolution, or as suitable for the proposed use.

B. Auxiliary Water Supply. Any water supply, other than the District's Water System, available to a customer's system. Such auxiliary waters may include water from another purveyor's public potable water supply, or any natural source(s) such as a well, spring, river, stream, etc. or "used waters" or "industrial fluids". Such auxiliary waters may be polluted or contaminated, or they may be objectionable, and may constitute an unacceptable water source over which the District does not have control.

C. Backflow. The flow of water (or other liquids, mixtures, or substances), under pressure, into the District's Water System from any source(s) other than the District's own source(s).

D. Backflow Preventer. A device or means designed to prevent backflow or back-siphonage.

1. Airgap. A means of backflow prevention utilizing the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device, and the flood level rim of said vessel. An approved air-gap shall be at least double the diameter of the supply pipe, measured vertically, above the top of the rim of the vessel; provided, however, that in no case shall the air-gap be less than one (1) inch. When an air-gap is used at the service connection to prevent the contamination or pollution of the District's Water System, an emergency by-pass shall be installed around the air-gap system and an approved reduced pressure principle device shall be installed by the by-pass system.

2. Reduced Pressure Principle Device. A backflow prevention device consisting of an assembly of two (2) independently operating approved check valves with an automatically operating differential relief valve between the two (2) check valves, tightly closing shut-off valves on either side of the check valves, plus properly located test cocks for the testing of the check and relief valves. The entire assembly shall meet the design and performance specifications and approval of a recognized and approved testing agency for backflow prevention assemblies. The device shall operate to maintain the pressure in the zone between the two (2) check valves at a level less than the pressure of the inlet of the device. At cessation of normal flow, the pressure between the two (2) check valves shall be no less than the pressure at the inlet of the device. In case of leakage of either of the check valves, the differential relief valve shall operate to maintain the reduced pressure in the zone between the check valves by discharging to the atmosphere. When the inlet pressure is two (2) pounds per square inch (psi) or less, the relief valve shall open to the atmosphere. To be approved, these devices must be readily accessible for in-line maintenance and testing, and shall be installed in a location where no part of the device will be submerged.

3. Double Check Valve Assembly. A backflow prevention device consisting of an assembly of two (2) independently operating approved check valves with tightly closing shut-off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve. The entire assembly shall meet the design and performance specifications and approval of a recognized and approved testing agency for backflow prevention devices. To be approved, the devices must be readily accessible for in-line maintenance and testing.

E. Back-Siphonage. The flow of water (or other liquids, mixtures, or substances) into the District's Water System from any source(s) other than the District's own source(s), caused by a sudden reduction of pressure in the District's Water System.

F. Board. The Board of Directors of the Bayview Water and Sewer District.

G. Contamination. The impairment of the quality of the potable water supply by sewage, industrial fluids or waste liquids, compounds, or other materials, to a degree which creates an actual hazard to the public health through poisoning or through the spread of disease.

H. Control. The right and power over the sanitary quality of water.

I. Cross-Connection. Any physical connection, or other arrangement of piping or fixtures, between two (2) otherwise separate piping systems, one (1) of which contains potable water and the other of which contains non-potable water or industrial fluids of questionable safety, through which, or because of which, backflow or back-siphonage may occur into the District's Water System. A metered water service connection between the District's Water System and a customer system, which is cross-connected to a contaminated fixture, industrial fluid system, or with a potentially contaminated supply or auxiliary water system, constitutes a type of cross-connection. Other types of cross-connections include, but are not necessarily limited to, connectors such as swing connections, removable sections, four-way plug valves, spools, dummy sections of pipe, swivel or changeover devices, sliding multiport tube, solid connections, etc.

J. Cross-Connection Control by Containment. The installation of an approved backflow prevention device in any customer system at the metered water service connection.

K. Designee or Designate. An employee of the District designated by the Board to enforce the provisions of this Resolution.

L. District. The Bayview Water and Sewer District.

M. Hazard, Degree of. This term is derived from an evaluation of the potential risk to the public health and the adverse effect of the hazard upon the District's Water System.

1. Hazard - Health. Any condition, device, or practice in the District's Water System or its operation, which could create, or in the judgment of the Board may create, a danger to the health and well-being of any water customer.

a. Hazard - Plumbing. A plumbing type cross-connection in a customer system that has not been properly protected by an air-gap separation or back-flow prevention device is deemed to constitute a health hazard.

2. Hazard - Pollutant. An actual or potential threat to the physical properties, or to the potability, of the District's Water System, which could constitute a nuisance, or be aesthetically objectionable, or could cause damage to the District's Water System, but would not be dangerous to health.

3. Hazard - System. An actual or potential threat of severe damage to the physical properties of the system, or of a pollution or contamination which would have a protracted effect on the quality of the potable water in the District's Water System.

N. Industrial Fluids System. Any system containing a fluid or solution which may be chemically, biologically, or otherwise contaminated or polluted in a form or concentration such as would constitute a health, system, pollutant, or plumbing hazard if introduced into the District's Water System. "Industrial Fluids Systems" include, but are not necessarily limited to: polluted or contaminated waters; all types of process waters and "used waters" originating from the District's Water System which may have deteriorated in sanitary quality; chemicals in fluid form; plating acids and alkalies; circulated cooling waters connected to an open cool tower and/or cooling towers that are chemically or biologically treated or stabilized with toxic substances; contaminated natural waters such as from wells, springs, streams, rivers, irrigation canals or systems, etc.; oils, gases, glycerin, paraffin, caustic and acid solutions, and the liquid and gaseous fluids used for industrial or other purposes or for fire-fighting purposes.

O. Master. The Water Master of the District, appointed by the Board.

P. Pollution. The presence of any foreign substance (organic, inorganic, or biological) in water which tends to degrade its quality so as to constitute a hazard or impair the usefulness or quality of the water to a degree which does not create an actual hazard to the public health, but which does adversely and unreasonably affect such waters for domestic use.

Q. Water - Metered Water Service Connection. The terminal end of a service connection from the District's Water System (that is, where the District loses control over the water at its point of delivery to the customer's system), being the downstream end of the meter. There should be no unprotected takeoffs from the service line ahead of any backflow prevention device. Service connections shall also include metered or un-metered water service connections from a fire hydrant and all other temporary or emergency water service connections to the District's Water System.

R. Water - Nonpotable. Water which is not safe for human consumption or which is of questionable potability.

S. Water - Potable. Any water which, according to recognized standards, is safe for human consumption.

T. Water System. The water system is made up of two (2) parts; namely, the District's Water System and the District's customer's system.

1. The District's Water System consists of the source and the distribution system under the complete control of the District, up to the point where the customer systems begin.

a. The source shall include all components of the facilities utilized in the production, treatment, storage, and delivery of water to the distribution system.

b. The distribution system shall include the network of conduits used for the delivery of water from the source to the customer system.

2. The customer system consists of all water components beyond the metered water service connections.

U. Water - Used. Any water supplied by the District from the District's Water System to a customer system after it has passed through the metered water service connection and is no longer under the control of the District.

Section 3.0 Responsibility.

A. The Board shall be responsible for the protection of the District's Water System from contamination or pollution due to the backflow or back-siphonage of contaminants or pollutants through the metered water service connections.

B. If, in the judgment of the Board or Water Master, or any other designee of the Board, an approved back-flow prevention device is required at any metered water service connection for the safety of the District's Water System, the Board, Water Master, or any other authorized designee of the Board shall give notice, in writing, to the affected customer to install an approved backflow prevention device at each of such customer's metered water service connections. Within the time prescribed by the Board, Water Master, or other authorized designee, the customer shall install such approved device or devices at the customer's own expense. Any failure, refusal, or inability on the part of the customer to install said device or devices shall immediately constitute grounds for discontinuing water service to such metered water service connections until such device or devices have been properly installed to the District's satisfaction.

C. If the customer files with the District a written protest of the degree of hazard involved and commensurate degree of protection required to be provided, the matter shall be referred by the District to the appropriate health agency. If the protest involves a new meter installation, the District shall not commence water service until after the health agency has delivered its written decision to the District. The written decision of the health agency shall be final.

Section 4.0 Implementation.

A. No metered, un-metered, or any form of water service connection to any premises shall be placed into service by the District unless the District's Water System is protected as required by State laws and regulations and by this Resolution. Service of water to any premises shall be immediately discontinued by the District if a backflow prevention device required by this Resolution is not installed, tested and maintained, or if it is found that a backflow prevention device has been removed, by-passed, or if any unprotected cross-connection exists on the premises. Service shall not be restored until such conditions or defects are corrected to the satisfaction of the District.

B. All customer systems shall be open for inspection at all reasonable times to authorized representatives of the District to enable the District to ascertain the existence of cross-connection or other structural or sanitary hazards, including violations of this Resolution. When such a condition becomes known, the District shall deny or immediately discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the condition(s) in conformance with State laws and District resolutions relating to plumbing and water supplies, and in conformance with any other regulations adopted pursuant thereto.

C. An approved backflow prevention device shall be installed on each metered water service connection to a customer system at or near the property line or immediately inside the building being served; but, in all cases, such device shall be installed before the first branch line leading off the service wherever the following conditions exist:

1. In the case of premises having an auxiliary water supply which is not, or may not be, of safe bacteriological or chemical quality, and which is not acceptable as an additional source by the District, the District's Water System shall be protected against backflow from the premises by the installation of a backflow prevention device in the customer's system appropriate to the degree of hazard.

2. Whenever backflow protection has been found necessary on a customer's system, then all metered water service connections shall be protected by an approved backflow device, regardless of whether any are not being used.

3. In the case of premises on which any industrial fluid, or any other objectionable substance, is handled in such a fashion as to create an actual or potential hazard to the District's Water System, including the handling of process waters and waters

originating from the District's Water System which have been subject to deterioration in quality, the installation of a backflow prevention device appropriate to the degree of hazard shall be required.

4. Whenever the following conditions exist on any premises, the District's Water System shall be protected against backflow by the installation of a backflow prevention device:

a. Internal cross-connections that cannot be permanently corrected or controlled; or

b. Intricate plumbing and piping arrangements; or

c. Where entry to all portions of the premises is not readily accessible for inspection purposes, making it impractical or impossible to ascertain whether or not dangerous cross-connections exist.

D. The type of protective device required under the foregoing paragraph "C" shall depend upon the degree of hazard, which exists as follows:

1. In the case of any premises where there is an auxiliary water supply as stated in subsection C.1 of this Section, and such supply is not subject to any of the following rules, the District' Water System shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device.

2. In the case of any premises where there is water or a substance that would be objectionable, but not hazardous to health, if introduced into the District's Water System, the District's Water System shall be protected by an approved double check valve assembly.

3. In the case of premises where there is any material dangerous to health which is handled in such a fashion as to create an actual or potential hazard to the District's Water System, the District's Water System shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device. Examples of premises where these conditions will exist include sewage treatment plants, sewage pumping stations, chemical manufacturing plants, hospitals, mortuaries, and plating plants.

4. In the case of any premises where there are "uncontrolled" cross-connections, either actual or potential, the District's Water System shall be protected by an approved air-gap water separation or an approved reduced pressure principle backflow prevention device.

5. In the case of any premises where, because of security requirements or other prohibitions or restrictions, it is impossible or impractical to make a complete in-plant cross-connection survey, the District's Water System shall be protected against backflow or back-siphonage from the premises by the installation of a backflow prevention device. In this case, maximum protection will be required; that means an approved air-gap separation or an approved reduced pressure principle backflow prevention device shall be installed in each metered (or other) water service connection to the premises.

6. In general, a double check-valve will be deemed sufficient when any one (1) of the following conditions exist:

a. Pressure in the customer system may, at any time, exceed the water pressure in the District's Water System.

b. The customer system includes more than one (1) metered water service connection.

c. Where a swimming pool is maintained.

d. Where a closed elevated storage tank is maintained.

e. Auxiliary water system (not interconnected).

f. The customer system is so extensive that it is not easily observed or checked as to maintenance and use.

g. Building with house pump and/or storage tank.

h. Chemically treated potable water system.

i. Commercial laundry.

j. Dairy or other cold storage plant.

k. Fire system with pumps and/or water storage tank.

l. Manufacturing, processing, or fabricating plant using nontoxic materials.

m. Manufactured and/or mobile home parks.

n. Irrigation systems where nothing is injected into the customer's systems.

o. Apartments and other multi-family accommodations (rental or owner occupied).

p. Churches, temples, and similar places of religious worship.

q. Any connection that the District or its designee may consider a cross-connection.

7. A reduced pressure backflow preventer, as near to the metered water service connection as possible will be required where sewage, toxic wastes, or other injurious materials are pumped, processed, or treated. In general, a reduced pressure backflow preventer will be required when any one (1) of the following conditions exist:

a. Sewage treatment plant or pump station.

b. Auxiliary water system (interconnected)

c. Winery.

d. Building with sewage ejectors.

e. Cannery, parking house, or reduction plant.

f. Car wash with water reclamation system.

g. Centralized heating and air-conditioning plant.

h. Chemical plant.

i. Civil works (not subject to State inspection)

j. Dye works.

k. Film processing or other laboratory.

l. Fire system with auxiliary supply.

m. Hospital, mortuary, or crematorium.

n. High school or college and other such secondary school and higher education facilities.

o. Food processing plant.

p. Restaurant, bar, cafe, lounge, and other such eating and/or drinking establishments.

q. Rendering plant.

r. Veterinary or pet hospital.

s. Steam boiler.

t. Plating facility or metal finisher.

u. Irrigation system where anything is injected into the customer system.

v. Manufacturing, processing, or other fabricating plant using toxic material.

w. Paper production plant.

x. Restricted, classified, or other closed facility.

y. Sand and/or gravel plant.

z. Where a cross-connection is maintained.

aa. Any connection that the District may consider to be a cross-connection.

E. Any backflow prevention device required by this Resolution shall be of a model and size approved by the District. The term "Approved Backflow Prevention Device" shall mean a device that has been manufactured in full conformance with the standards established by the American Water Works Association, as set forth in its publication entitled "AWWA C506-78 Standards for Reduced Pressure Principle and Double Check Valve Backflow Prevention Devices" (or the most current update thereof) and, that has met completely the laboratory and field performance specifications of the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California, as set forth in its Manual of "Specifications of Backflow Prevention Devices" and said publications, including any amendments or revisions thereto, which are hereby adopted and incorporated into this Resolution as fully as if set out at length herein. Final approval shall be evidenced by a "Certificate of Approval" issued by an approved testing laboratory, certifying full compliance with said AWWA Standards and FCCC and HR Specifications.

F. The following testing laboratory is hereby approved by the Board to test and certify backflow preventers:

Foundation for Cross-Connection Control and Hydraulic Research
University of Southern California
University Park
Los Angeles, CA 90007

1. Testing laboratories other than the laboratory listed herein will be added to an approved list as they are approved by the Board.

2. Backflow preventers which may be subjected to back pressure or back-siphonage that have been fully tested and have been granted a Certificate of Approval by said approved laboratory and are listed on the laboratory's current list of "Approved Devices" may be used.

G. The District will make available a list of approved backflow device testers. The list is not to be construed to be restrictive or recommended by the District. Anyone desiring inclusion on the list shall provide the District with valid certification acceptable to the District.

H. It shall be the duty of the customer/user at any premises where backflow prevention devices are installed to have certified inspections and operational tests made once per year. In those instances where the District deems the hazard to be great enough, it may require certified inspections at more frequent intervals. These inspections and tests shall be at the expense of the customer/user, and shall be performed by a qualified manufacturer's representative, by an approved certified tester, or by Certified District personnel. It shall be the duty of the District to see that these timely tests are made. The customer/user shall notify the District, in advance, when the tests are to be undertaken by anyone other than the District, so that District personnel may witness the tests if it is so desired. These devices shall be repaired, overhauled, or replaced at the expense of the customer/user whenever said devices are found to be defective. Records of such tests, repairs, and overhaul shall be kept and made available to the District.

I. All presently installed backflow prevention devices which do not meet the requirements of this Resolution shall be replaced by a backflow prevention device meeting the requirements of the Resolution when the District finds that the device constitutes a hazard to health.

Section 5.0 Severability. If any clause, sentence, paragraph, section, or part of this Resolution or the application thereof to any person or circumstances shall be adjudged by any court of competent jurisdiction to be invalid, such order or judgment shall be confined in its operation the controversy in which it was rendered and shall not affect or invalidate the remainder of any part thereof to any other person or circumstances and to this end, the provisions of each clause, sentence, paragraph, section, or part of this Resolution are hereby declared to be severable.

Section 6.0 Effective Date. This Resolution shall take effect and be in force immediately upon its adoption. This Resolution, or a summary thereof, shall be published once in a newspaper of general circulation within ten (10) days of its adoption.

Adopted this 12th day of August, 2003.

____
Charles Waller; Chairman
Board of Directors
Bayview Water and Sewer District

ATTEST:

I, Debra Peck, Secretary/Treasurer of the Bayview Water and Sewer District, certify that the foregoing resolution was passed by the Board of Directors of the Bayview Water and Sewer District, by a vote of a majority of the members thereof, at a regular meeting held on the 12th day of August, 2003, of which all directors were duly notified, and said Resolution was adopted by the following vote:

AYES, and in favor thereof,	Board members:_____
NOES,	Board members:_____
ABSENT,	Board members:_____
ABSTAIN,	Board members:_____

I further certify that I have carefully compared the same with the original Resolution on file and of record in my office; that said Resolution is a full, true, and correct copy of the original Resolution adopted at said meeting; and that said Resolution has not been amended, modified, or rescinded since the date of its adoption, and is now in full force and effect.

IN WITNESS WHEREOF, I have set my hand and affixed the official seal of the BAYVIEW WATER AND SEWER DISTRICT on August 12, 2003.

____
Debra Peck; Secretary/Treasurer BWSD

SEAL

Appendix 2-H

2017 Water Quality Report

THIS PAGE WAS INTENTIONALLY LEFT BLANK

2017 Annual Drinking Water Quality Report

Bayview Water and Sewer District

We're pleased to present to you the 2017 Annual Quality Water Report. This report is designed to inform you about the quality water and services we deliver to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water. Our water sources are two wells located in Farragut State Park. As of year end 2017, we had 473 service connections serving a population of 1277 full time and part time residences.

We are pleased to report that our drinking water is safe and meets federal and state requirements.

If you have any questions about this report or concerning your water utility, please contact **Bob Kuchenski, Licensed Water System Operator, at 208-683-3949.** We want our valued customers to be informed about their water service. If you want to learn more, please attend any of our regularly scheduled meetings. They are held on the **3rd Wednesday of every month at 3pm at the Bayview Community Center located at 20298 E. Perimeter Rd. in Bayview. Four times per year, meetings are held on the third Thursday of the month at 7pm. Visit our website at http://bayviewwaterandsewer.com for more details.**

Bayview Water and Sewer District routinely monitors for constituents in your drinking water according to Federal and State laws. This table shows the results of our monitoring for the period of **January 1st to December 31st, 2017** unless otherwise indicated. All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some constituents. It's important to remember that the presence of these constituents does not necessarily pose a health risk.

What does this mean?

MCL's (Maximum Contaminant Levels - see definitions below) are set at very stringent levels. To understand the possible health effects described for many regulated constituents, a person would have to drink 2 liters of water every day at the MCL level for a lifetime to have a one-in-a-million chance of having a health effect.

As you can see by the table below, our system had no violations, with the exception of one monitoring violation. Our water system is required to take 2 routine coliform/e-coli monitoring samples each month. When we changed operators last August, we took the 2 specified samples, one from Bayview and one from the Dromore area. Unknown to us at the time was that one sample was required from Bayview and one from the Cape Horn area. Since the routine sample was not taken from the Cape Horn area, it was considered a monitoring violation. *The health effects of this missing sample are unknown*. We're proud that your drinking water meets or exceeds all Federal and State requirements. We have learned through our monitoring and testing that some constituents have been detected. However, the EPA has determined that your water IS SAFE at these levels.

We at Bayview Water and Sewer District work around the clock to provide top quality water to every tap. We ask that all our customers help us protect our water sources, which are the heart of our community, our way of life and our children's future. Please call our office at (208)683-3949 if you have questions.

2017 Consumer Confidence Report (CCR)

I. Water System Information

Water System Name: Bayview Water and Sewer District	PWS ID #: 1280014
Water System Operator: Bob Kuchenski	
Address: PO Box 637	Tel #: 208-683-3949
City, State, Zip Code: Bayview, ID 83803	
Population Served: 1277	Number of Connections: 473
Date of CCR Distribution: 6/20/2018	For Calendar Year: 2017
Regularly Scheduled Meeting(s): Visit **http://bayviewwaterandsewer.com** for dates and times.	

II. Water Sources

Groundwater Sources (springs, wells, infiltration galleries):	
1) Source #: 1	a) Sample Site Location: Pump house #7
	b) Location Description: Farragut State Park, Highway 54
2) Source #: 2	a) Sample Site Location: Pump house #8
	b) Location Description: Farragut State Park, Kinglet Road
Groundwater/Surface Water Contamination Sources (if known): Erosion of natural deposits	
Source Water Assessment or Protection Plan Available? Yes, online at: http://www2.deq.idaho.gov/water/swaOnline/Search	

III. Special Compliance Violations

Treatment techniques: na
Monitoring/Reporting: 1
Public notification/Record keeping: na
Special monitoring requirements: na
Administrative or judicial orders: na
Consent orders: na
Notice of Violations (NOV): na

IV. Definitions

Action Level (AL): The concentration of a contaminant, which, if exceeded, triggers treatment, or other requirements which a water system must follow.

Maximum Contamination Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
Maximum Contamination Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
Parts per million (ppm) or Milligrams per liter (mg/l) - one part per million corresponds to one minute in two years or a single penny in $10,000.
Parts per billion (ppb) or Micrograms per liter - one part per billion corresponds to one minute in 2,000 years, or a single penny in $10,000,000.
Picocuries per liter (pCi/L) - picocuries per liter is a measure of the radioactivity in water.
Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
WAIVER (Waived) - Waivers are granted for chemicals known to NOT be contained within a geographic area. The Bayview Water and Sewer District is within the Rathdrum Prairie Aquifer Wellhead Protection Area, which is protected from certain constituents by the State of Idaho.
None Detected (ND) – no contaminant detected.

V. Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800)426-4791 or http://www.epa.gov/safewater/hotline/.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800)426-4791 or http://www.epa.gov/safewater/hotline/.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Contaminants that may be present in source water before we treat it include:
Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, or farming.
Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

Lead Informational Statement (Health effects and ways to reduce exposure)

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. ***The utility named above*** is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your drinking water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available form the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

VI. Level of Detected Chemical and Radiological Contaminants and Associated Health Effects Language

Unless otherwise noted, the data presented in this water quality table is from testing done between January 1 - December 31, 2017.

Contaminant	Violation (Y/N)	MCL	MCLG	Lowest Level Detected:	Highest Level Detected:	Date Tested (mm/yy):	Typical Source of Contamination	Health Effects Language
Radioactive Contaminants & Inorganic Contaminants (Units)								
Arsenic (ppb)	N	10	0	4.4	4.4	7/17	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.	
Barium (ppm)	N	2	2	.033	.033	7/17	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.	
Gross Alpha, Radon & Uranium (PCI/L)	N	15	0	.403	.403	9/16	Erosion of natural deposits.	

VII. Reporting Lead/Copper

- **Lead/Copper:**

Contaminant	Date(s) Collected	90th Percentile	Action Level	MCLG	#of sites above Action Level	Violation Y/N	Possible Source of Contamination
Lead (ppb)	8/16	2	15	0	0	N	Corrosion of household plumbing systems: Erosion of natural deposits.

Copper (ppm)	8/16	.047	1.3	1.3	0	N	Corrosion of household plumbing systems: Erosion of natural deposits.

VIII. Level of Detected Contaminants and Associated Health Effects Language for Systems that must comply with the Disinfection/Disinfection by Products Rule, Surface Water Treatment Rule, and the Long Term 1 Enhanced Surface Water Treatment Rule.

Unless otherwise noted, the data presented in this water quality table is from testing done between January 1 - December 31, 2017.

Contaminant	**Violation (Y/N)**	**MCL**	**MCLG**	**Highest Level Detected**	**Running Annual Average***	**Range***	**Typical Source of Contamination**	**Health Effects Language (include only if system exceeds MCL)**
Disinfection By Products (applies to all systems practicing chlorination) * *running annual average and range apply only to systems collecting disinfection by products on a quarterly basis. Systems that collect DBPs on an annual or less frequent basis should report detections in the highest level detected column and omit running annual averages and range data.*								
Total Trihalomethanes	N	80	n/a	3.24			Byproduct of drinking water chlorination.	
Haloacetic Acid Group 5	N	60	n/a	0			Byproduct of drinking water chlorination.	

- **Chlorine:**

Maximum Residual Disinfectant Level Contaminant	**Violation (Y/N)**	**MCL**	**MCLG**	**Highest Level Detected**	**Running Annual Average**	**Sample Date**	**Typical Contamination Source**	**Health Effects Language (include only if MCL is exceeded)**
Chlorine	N	MRDL = 4	MRDLG = 4	.7	.4	Monthly	Water additive used to control microbes	

J·U·B ENGINEERS, INC.

Bayview Water and Sewer District
Water System Facility Plan

Development of Improvements

PROFESSIONAL ENGINEER
REGISTERED
7768
2.24.20
STATE OF IDAHO
STEPHEN P. JAMES

February 2020

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Contents

Figures

Tables

Appendices

THIS PAGE WAS INTENTIONALLY LEFT BLANK

TM No. 3 – Development of Improvements

3.1 Introduction

The Bayview Water and Sewer District's (the District's) potable water system has various operational and capacity issues at today's service conditions, as noted in Technical Memorandum 2. The continued aging of components and increasing demands may impose additional stresses on the system and affect the District's ability to consistently meet demand and water quality criteria. This technical memorandum evaluates the expected system performance and operations with No Action and develops options for the system through the 20-year planning period (i.e., 2037).

Costs presented in subsequent sections are in 2019 dollars with capital costs assuming 10 percent to 30 percent contingency. Project design and construction management (i.e., engineering-related costs) are included. Costs also include prevailing wages (i.e., Davis-Bacon Wages) and American Iron and Steel (AIS) requirements, as these items may impact final costs depending on the District's funding source for the selected improvements. Operations and maintenance (O&M) costs presented are incremental costs above existing O&M expenses and do not include depreciation funding.

3.2 No-Action Alternative

Major portions of the water system in the Bayview area were originally constructed in the early 1940s and the late 1970s, with expansions and upgrades occurring over later years. Therefore, some major components of the system will be either older than 95 years or around 60 years old at the end of the 20-year planning period if no action is taken. An estimation of the existing system with No Action is included in **Table 3-1**.

Table 3-1 – Summary of Water System with No Action

Item	Existing Conditions (a)	Projected Condition in 2037 with No Action
Supply	• Well 7 does not have an automatic transfer switch for the standby generator. • Well 8 does not have a source of backup power. • While the pumps and motors on Well 7 and 8 are believed to have been recently re-built, their true ages are unknown. • The control (SCADA) system is out of date and does not have remote review capabilities. • Water right for Well 7 should be converted to the more flexible "Municipal" designation.	• Without automatic standby power, the production from the well sources remains susceptible to power outages. • Pumping capacity appears to remain adequate to provide peak hour demand; with the balance provided by storage tank. • In general, the system remains similar to existing, with decreasing performance as components age.

Item	Existing Conditions [(a)]	Projected Condition in 2037 with No Action
Storage	• The existing control system (SCADA) loses connectivity during power outages and does not provide remote access for the system operators. • The Farragut Tank has visible leaks and notable deterioration of the interior and exterior coating, as well as continued structural deterioration. • The existing storage volumes at Farragut and Dromore do not appear to meet the target storage requirements plus desired fire suppression storage goals for commercial areas.	• The control system will continue to be unreliable during power outages and will increase the risk of leaving the system with an inadequate water storage during an emergency. • The main storage facility for the District will be about 95 years old and susceptible to leakage and potential structural failure. • The tanks will be inadequate for meeting required storage volumes under all future scenarios without system improvements.
Transmission/ Distribution	• The system has significant unaccounted water. • Portions of the existing system (Post Office, Dromore area) cannot meet maximum day demand at certain points in the system at the required pressure of 40 psi. • Many of the existing water meters in the Bayview area are 40 years old and well past their useful life (20 years). • Recommended fire flows of 1,000 gpm cannot be provided throughout the system in the residential areas at the required pressure of 20 psi.	• The system will continue to experience a large amount of water that is unaccounted for through the meters. This non-revenue water will most likely increase due to continued system aging. • Pressures and flow will continue to be reduced with increasing demand. • Many water meters will be 60 years old and will have failed or have reduced accuracy. • Future available fire flow will continue to be reduced with system aging and increasing system demand.

(a) Reference Technical Memorandum No. 2 for a complete list of observed deficiencies.

3.3 Supply Improvement Options

Improvements for the supply portions of the District's public water system are discussed in subsequent sections. A summary of the proposed improvements and the corresponding costs are included in the following sections.

3.3.1 General Improvements

One of the strengths of the District's water system is the robust capacity of both of the source wells (each at 750 gpm). The deficiencies noted in **Table 3-1** were reviewed with District board members and staff to determine if upgrades were necessary and the corresponding scope of such work. Deficiencies identified previously but not addressed herein may result in additional operation and maintenance expenses, water service interruptions, or unplanned replacement, but were not considered to be necessary within the planning period. A summary of the recommended general improvements for the supply component of the District's water system, based on discussions with the District, is listed below. The capital cost for these improvements is approximately $26,000. Detailed opinions of probable cost sheet are included in **Appendix 3-C**.

- Upgrade the existing control system (SCADA) at the well sites to provide for more reliable control.
- Aggregate and convert all the District's water rights and supply diversion points to a "Municipal" designation to allow for future flexibility of the District.
- Extend the leases for the well sources as the end dates approach (Well 7 in 2027, Well 8 in 2024).
- Convert the existing Well #7 water right to a municipal right.

3.3.2 Well 7 Upgrades

A summary of the recommended general improvements for Well 7 based on comments received from IDEQ during technical review of the Facility Plan and from the District's March 2019 Sanitary Survey are listed below. The capital cost for these improvements is approximately $123,000. Detailed opinions of probable cost sheet are included in **Appendix 3-C**.

- Provide an automatic transfer switch for the existing generator.
- Provide a pump control valve, system controls, and water receiving structure for surge/transient control and pump to waste function.

3.3.3 Well 8 Upgrades

A summary of the recommended general improvements for Well 8 based on comments received from IDEQ during technical review of the Facility Plan and from the District's March 2019 Sanitary Survey are listed below. The capital cost for each improvement is noted below. Detailed opinions of probable cost sheet are included in **Appendix 3-C**.

- Provide a backup power source (generator) and an automatic transfer switch for the new generator ($130,000).
- Provide a pump control valve, system controls, and water receiving structure for surge/transient control and pump to waste function ($100,000).

3.3.4 Future Considerations for Replacement of Existing Source Pumps

The District's well sources date back to the early 1940s when they were drilled and developed for the Farragut Naval installation. The District acquired these wells in the late 1970s (Well 7) and 1980s (Well 8). Since that time, these wells have performed very reliably with Well 7 meeting the majority of the pumping needs.

While it is believed that the motors for both wells (and possibly the pumps) have been rebuilt in the last decade or so, the District does not have available records that confirm this. The current contract operator also has only been with the District since 2017 and all the board members have only served for three years or less. Therefore, the institutional knowledge regarding their history and repair or replacement is not available.

While the pumps currently operate very dependably, there will most likely be a need to replace some portion of existing motor or pump system at some point during the planning period. New motors and/or pumps will likely improve the electrical efficiencies of the system as well.
If replacement of the well pumps was considered at some point in the future, it would be expected that they would be replaced with a similar type (vertical turbine) and capacity (750 gpm) due to the existing water rights. Based on a recent quote from an area supplier, the cost for the replacement of one well motor, column piping, and pump would be in the range of $80,000 to $150,000, depending on required components. Detailed opinions of probable cost sheet are included in **Appendix 3-C**.

3.3.5 Summary of Improvement Options

Improvements for the District's water supply system discussed in the preceding sections, as well as the corresponding costs, are summarized in **Table 3-2**. Detailed opinions of probable cost sheet are included in **Appendix 3-C**.

Table 3-2 – Summary of Recommended Improvements for Supply

Item	Improvements Summary	Approximate Capital Cost [(a)]
General Improvements	• Upgrade the control system (SCADA) at the well sites.	$32,000
	• Aggregate and convert existing water rights and all supply diversion points to a "Municipal" designation following the Adjudication Decree.	--
	• Extend the leases for the well sources as the end dates approach (Well 7 in 2027, Well 8 in 2024).	--
Well 7 Upgrades	• Add an automatic transfer switch. • Provide a pump control value for surge protection and pump to waste functions	$125,000
Well 8 Upgrades	• Provide a backup power source (generator) and an automatic transfer switch for the new generator.[b]	$130,000
	• Provide a pump control value for surge protection and pump to waste functions	$100,000
Well Pump Replacement	• Replace the well pump at either Well 7 or Well 8.	$80,000 to $150,000

(a) Approximate capital cost in 2019 dollars assuming 20 percent contingency. Includes project design, construction management, prevailing wages, and American Iron and Steel requirements.
(b) Generator is optimal and only needed to reduce standby storage volume requirements.

3.4 Storage Improvement Options

Improvements for the storage portion of the District's public water system are discussed in subsequent sections. A summary of the proposed improvements and costs are included in **Section 3.4.5**.

3.4.1 General Improvements

The deficiencies noted in **Table 3-1** were reviewed with District board and staff to determine if upgrades were necessary and the corresponding scope of such work. Deficiencies identified previously, but not addressed herein, were not considered to be necessary within the planning period. These may result in additional operation and maintenance expenses, water service interruptions, or unplanned replacement. A summary of the recommended general improvements for the storage component of the District's water system, based on those discussions, is listed below. The estimated cost for the general improvement detailed below is approximately $25,000. Detailed opinions of probable cost are included in **Appendix 3-A**.

- Upgrade existing control system (SCADA) including remote access and data collection for the system operator.

3.4.2 Rehabilitate Existing Farragut Storage Tank

As noted in TM 2, the District's existing 38-foot-diameter 225,000-gallon elevated concrete storage tank has minor leaks and is showing signs of age (cracking). This section evaluates rehabilitation of the existing storage tank. The three rehabilitation options evaluated include crack sealing via epoxy injection, crack sealing plus a geomembrane liner, and full crack sealing with interior and exterior epoxy coating.

All rehabilitation options include health and safety improvements for the existing tank, including:

- Replacing the interior stairs, and exterior platform and fall protection to address safety concerns with both items
- Replacing the existing overflow piping.
- Replacing the existing isolation valves.

Tank rehabilitation options, including approximate costs, are summarized in **Table 3-3**. Detailed opinions of probable cost are included in **Appendix 3-A**.

Table 3-3 – Storage Tank Rehabilitation Material Comparison

Item	Epoxy Injection	Liner	Coating
Description	• Epoxy-based sealant is injected into major cracks in the existing storage tank.	• A new geomembrane liner is installed in the existing storage tank. • Epoxy-based sealant is injected into major cracks in the existing storage tank prior to installation of the liner.	• Interior is coated with an epoxy-based coating, while the exterior is coated with acrylate-based coating. • Epoxy-based sealant is injected into major cracks in the existing storage tank prior to coating application.
Advantages	• Lower capital cost than other rehabilitation methods. • May provide some structural benefit to the tank.	• Completely seals the tank interior.	• Completely seals the tank interior and recoats the tank exterior. • Addresses both interior and exterior surface deficiencies providing longer life.
Disadvantages	• Difficult to seal small, hairline cracks, so could allow continued seepage. • Provides spot repairs as opposed to rehabilitation of the entire tank. • Does not address exterior tank deficiencies.	• Does not address exterior tank deficiencies. • Installation would be difficult due to access via the roof hatch and with the existing interior concrete columns.	• Higher capital costs. • Does not repair any existing structural deterioration.
Estimated Capital Cost (a), (b)	$310,000	$550,000	$750,000

(a) Approximate capital cost in 2019 dollars assuming 20 percent contingency. Includes project design, construction management, prevailing wages, and American Iron and Steel requirements.
(b) Includes tank rehabilitation and maintenance items.

Advantages and disadvantages of rehabilitation versus constructing a new storage tank are listed below.

- Advantages of Rehabilitation
  - Lower capital cost than constructing a new storage tank.
  - Current storage volume is adequate for existing operational storage requirements plus the lower range of fire suppression storage.
  - Remaining life is expected to be equal to or greater than planning period unless there is a significant seismic event.
- Disadvantages of Rehabilitation
  - Does not address the structural condition of the existing tank.
  - Tank does not meet current seismic building code requirements.
  - Tank would be around 95 years old at the end of the planning period (2037).

- An extension of the lease of this facility must be in place before a rehabilitation project is considered. Currently the lease ends in 2027.
- The storage tank must be out of service while rehabilitation work is performed requiring coordination with Farragut State Park.
- Current storage volume may not be adequate to meet future operational storage requirements plus target fire suppression storage for commercial areas of Bayview unless the District adds reliability (such as adding standby power at Well #8).

Limited information is available regarding the tank design and construction. Further, the actual condition of the structural components is unknown, so it is difficult to determine the remaining tank life. If rehabilitation of the tank is chosen, fully coating the interior of the tank is advisable to protect the structure.

Very few tanks remain in service longer than 100 years, so the District will need to consider constructing a new tank in the next 25 years.

3.4.3 Construct New Main Storage Tank to Replace the Existing Farragut Tank

A new storage tank would address the current deficiencies of the existing tank (i.e., structural deterioration, leakage, inadequate storage for future requirements). Based on the existing supply firm capacity and minimum future storage requirements presented in **Section 2.5.2**, the minimum required working volume (operation plus fire suppression) for a new storage tank is approximately 305,000 gallons, for the 20-year planning period using historical water production. Assuming the 35 gpm reduction in flow from the pump pre-lube reduces non-revenue water by 18 MG per year, the required tank volume is reduced to 270,000 gallons.

The volume of a new tank could be reduced if the volume of non-revenue water was reduced. Reducing the non-revenue portion to 20% would allow the required tank volume to reduce to 250,000 gallons.

The lowest cost tank construction is at grade. To meet the existing overflow elevation of 2430, the tank would need to be constructed on the hillside north of Bayview.

Additional pressure-reducing valves will be needed on the north side of Bayview to avoid over-pressuring the lower elevation areas in the main portion of Bayview. Tank dimensions should be selected based on the elevation and slope of an acceptable site that would be acquired. For this analysis, it will be assumed that a new tank can be constructed at-grade on an acceptable site somewhere on the north side of Bayview with a base elevation of approximately 2400 - 2410. If the height of the usable storage is 20-30 feet, then the diameter would need to be 38-50 feet to provide a total tank volume of 250,000 to 305,000 gallons depending on the reduction of non-revenue water. For the purposes of cost comparison, a 305,000 gallon tank will be assumed, as well as a 1,100 feet of 12-inch water main to connect the tank to the existing system. Final tank geometry, volume, and placement will be determined during final design if this option is selected.

An additional benefit of a tank in this location is it could serve the Dromore area, replacing the existing Dromore tank. This would meet the full fire flow storage requirement in Dromore and increase pressure in the Dromore area by up to 10 psi. Additional piping would run from the tank to the existing Dromore piping on Perimeter Road.

A variety of tank materials was evaluated including steel (bolted or welded) and concrete (conventional cast-in-place or pre-stressed). Tank material options, including approximate costs, are summarized in **Table 3-4**. More detailed opinions of probable cost are included in **Appendix 3-A**.

Table 3-4 – New Storage Tank – Material Comparison

Item	Bolted Steel	Welded Steel	Cast-in-Place Concrete	Pre-Stressed Concrete
Description	• Tank consists of steel plates bolted together. • Various coatings available; epoxy and glass-fused are most common.	• Tank consists of steel plates welded together. • Typically epoxy coated.	• Concrete tank constructed using traditional cast-in-place reinforced concrete construction.	• Concrete tank walls are cast-in-place or precast and assembled on-site. • Tank walls are pre-stressed following concrete placement to place them in permanent compression.
Advantages	• Coatings applied in a controlled factory setting. • Lower capital costs. • Shorter construction times.	• Generally lower maintenance than bolted steel on ground level tanks. • Can be maintained and rehabilitated.	• Very low maintenance requirements. • Can be constructed against native soils.	• Pre-stressing significantly reduces cracking, minimizing leakage potential. • Low maintenance requirements.
Disadvantages	• Steel material is subject to oxidation and corrosion, which necessitates coatings. • Field repair or touchup of factory coatings may be difficult. • Bolts may loosen over time, requiring additional maintenance costs. • Difficult to re-coat in the future. • No long-term rehab options so shorter expected life (50 years).	• Steel is subject to oxidation and corrosion, which necessitates coatings. • Coatings are applied in the field and subject to weather and less-than-ideal application conditions. • Field-applied coatings typically require periodic touchup and re-application, increasing maintenance requirements.	• Concrete cracks, increasing potential for leaking. • Generally higher cost.	• Higher capital costs, especially for smaller tanks. • Requires a larger construction footprint to accommodate pre-stressing equipment. • Concrete cracks, increasing potential for leaking.
Capital Cost [(a)]	$1,200,000	$1,300,000	$1,450,000	$3,000,000
O&M Cost [(b)]	$30,000	$0	$0	$0
Approximate Total Cost	$1,230,000	$1,300,000	$1,450,000	$3,000,000

(a) Approximate capital cost in 2019 dollars assuming 20 percent contingency. Includes project design, construction management, prevailing wages, and American Iron and Steel requirements

(b) Estimated O&M costs over 20 year planning period. Note: Only bolted steel stank is expected to have increased maintenance over existing for bolt inspections.

Pre-stressed concrete was eliminated from consideration as the increased cost is expected to outweigh the benefits of reduced cracking/leakage. In addition, the increased construction area needed for the actual pre-stressing could significantly increase the construction cost of the site itself on what will most likely be a steep slope.

The steel tanks (bolted or welded) and cast-in-place concrete are all viable options for the District. The other storage tanks in the District are welded steel, making that a reasonable option for continued similarity in maintenance. A cast-in-place concrete tank may likely also be an option given serious consideration due to the relatively low long-term maintenance required for concrete tanks.

3.4.4 Construction of a New Storage Tank to Replace the Existing Dromore Tank

If rehabilitation of the main storage tank (Farragut Tank, Reservoir #1) is contemplated, the District may consider constructing a new storage tank to replace the existing Dromore Tank to meet the fire flow requirements. As noted in Chapter 2, the Dromore area requires 64,000 gallons of working storage. A new 24 foot diameter by 20 foot tall tank would provide 65,000 gallons of working volume. The new reservoir could be situated at a similar elevation as the existing tank. Material options for a new Dromore Tank are similar to those presented above for replacement of the Farragut Tank. Costs for replacing the Dromore Tank are summarized in **Table 3-5**. More detailed opinions of probable cost are included in **Appendix 3-A**.

Table 3-5 – New Dromore Tank – Material Comparison

Item	Bolted Steel	Welded Steel	Cast-in-Place Concrete	Pre-Stressed Concrete
Capital Cost [(a)]	$340,000	$375,000	$410,000	$780,000
O&M Cost [(b)]	$20,000	$0	$0	$0
Approximate Total Cost	$360,000	$375,000	$410,000	$780,000

(a) *Approximate capital cost in 2019 dollars assuming 20 percent contingency. Includes project design, construction management, prevailing wages, and American Iron and Steel requirements*
(b) *Estimated O&M costs over 20 year planning period.*

Similar to a new tank to replace the existing Farragut Tank, bolted steel, welded steel, or cast-in-place concrete are likely the best material options for replacing the existing Dromore Tank.

3.4.5 Summary of Improvement Options

Improvements for the District’s water storage discussed in the preceding sections, as well as the corresponding costs, are summarized in **Table 3-6**. Detailed opinions of probable cost are included in **Appendix 3-A**.

Table 3-6 – Summary of Recommended Improvements for Storage

Item	Improvements Summary	Approximate Capital Cost [a]
General Improvements	• SCADA system upgrades	$25,000
Rehabilitate Existing Storage Tank	• Health and Safety improvements plus rehabilitate the existing tank by repairing major cracks with epoxy injection.	$310,000
	• Health and Safety improvements plus rehabilitate the existing tank by repairing major cracks with epoxy injection and installing a new geomembrane tank liner.	$550,000
	• Health and Safety improvements plus rehabilitate the existing tank by repairing major cracks with epoxy injection and installing new interior and exterior coatings.	$750,000
Construct New Storage Tank to Replace the Existing Farragut Storage Tank	• Construct new 300,000-gallon bolted steel storage tank.	$1,200,000
	• Construct new 300,000-gallon welded steel storage tank.	$1,300,000
	• Construct new 300,000-gallon cast-in-place concrete storage tank.	$1,450,000
	• Construct new 300,000-gallon pre-stressed concrete storage tank.	$3,000,000
Construct New Storage Tank to Replace the Existing Dromore Storage Tank	• Construct new 100,000-gallon bolted steel storage tank.	$340,000
	• Construct new 100,000-gallon welded steel storage tank.	$375,000
	• Construct new 100,000-gallon cast-in-place concrete storage tank.	$410,000
	• Construct new 100,000-gallon pre-stressed concrete storage tank.	$780,000

(a) Approximate capital cost in 2019 dollars assuming 20 percent contingency. Includes project design, construction management, prevailing wages, and American Iron and Steel requirements.

3.5 Transmission/Distribution Improvement Options

Improvements for the transmission and distribution portions of the District's public water system are discussed in subsequent sections. A summary of the proposed improvements and the corresponding costs are included in **Section 3.5.7**.

3.5.1 General Improvements

The deficiencies noted in **Table 3-1** were reviewed with District board and staff to determine if upgrades were necessary and the corresponding scope of such work. Deficiencies identified previously, but not addressed herein, may result in additional operation and maintenance expenses, water service interruptions, or unplanned replacement, but were not considered to be necessary within the planning period. Based on discussions with the District and feedback from the public, the more major deficiencies of the transmission and distribution components, are detailed in subsequent sections. The general improvements indicated below for the transmission and distribution system are estimated at $85,000. Detailed opinions of probable cost are included in **Appendix 3-B**.

- Tune and re-build the existing PRVs to optimize system.
- Pressure relief valves for Booster Pump Station Discharges.

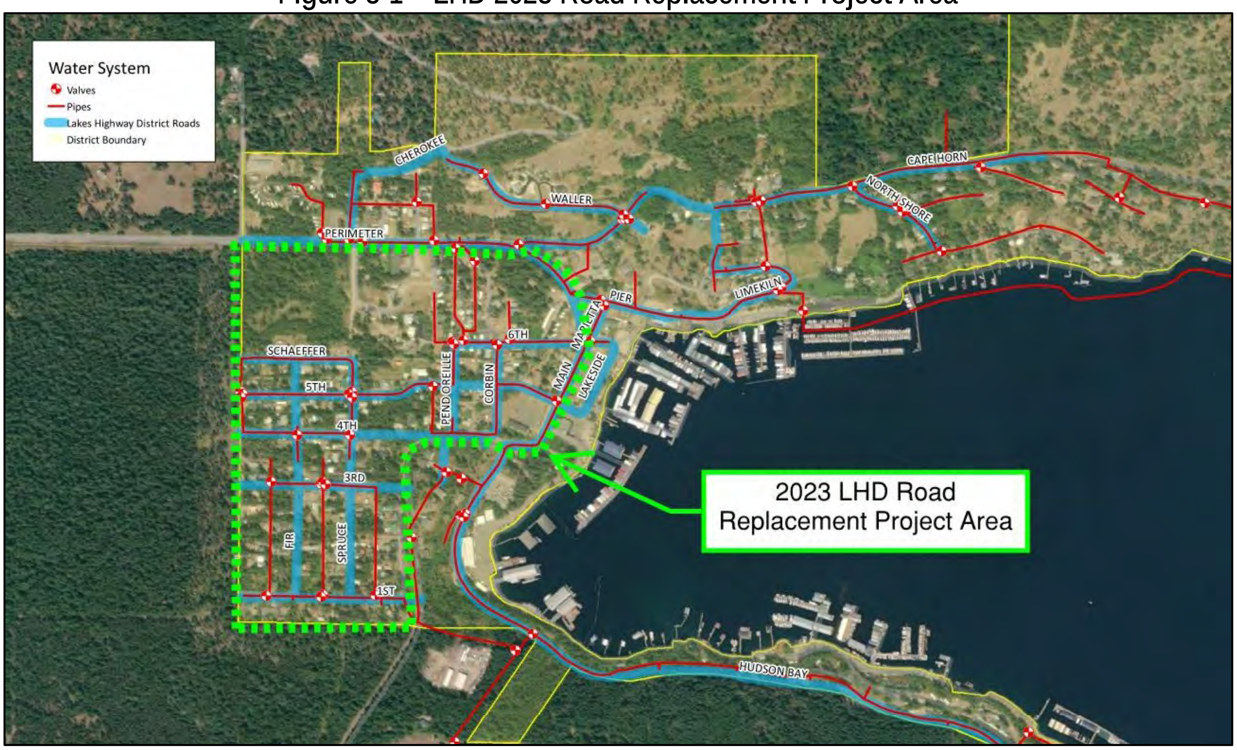
According to the District's operator, many of the water meters in the Bayview area are the original meters installed in the late 1970s. They are about 40 years old and are well past their design life (approximately 20 years). Replacing the existing meters will reduce meter inaccuracies and may help the District reduce their non-revenue water through the improved accuracy of the new meters. This option involves installing new radio-read meters for 360 of the existing connections (that have the original meters) and upgrading the District's meter-reading devices and software. The remaining areas of the District with newer meters could have a radio-read head installed on the existing meter (estimated at 120).

Discussions with the District Board indicate that they would like to consider replacing some or all of the existing service lines in addition to replacing meters.

3.5.3 Water Meter and Service Line Replacement

Lakes Highway District (LHD) has plans to undertake a road replacement project in Bayview in 2023. Per communication with the LHD Director of Highways, Eric Shanley, the roads to be replaced are generally located south of Perimeter Drive, east of Farragut State Park, and west of Highway 54. **Figure 3-1** shows roads owned and maintained by LHD, Bayview Water and Sewer District waterlines, and the approximate location of the planned 2023 road replacement project.

Figure 3-1 – LHD 2023 Road Replacement Project Area



In an effort to coordinate utility improvements with the roadway replacement, the District could consider replacing water service lines and meters prior to the LHD road replacement project. There are approximately 110 connections in roadways scheduled for replacement by LHD. The District could replace these connections prior to the roadway improvements and then replace other services and meters as part of a future project. Alternatively, the District could replace all meters in the LHD project area, regardless of whether the connection is under a road scheduled for replacement (approximately 207 total connections). Finally, the District may, either in conjunction with work in the LHD project area or as a separate project, consider replacing water services and meters for the remainder of the District.

The service and meter replacement involves the following components:

- Replacement of the service connection to the mainline.
- Replacement of the existing service pipeline.
- Installing a new curb valve on the service line prior to the meter box.
- Replacing the meter box and meter.
- Final surface repair (typically asphalt for the portion in the roadway and miscellaneous or gravel for portions outside the roadway).
    - For services inside the LHD project area, the District may be able to provide temporary repair on the roadways in advance of the LHD projects.
    - LHD has indicated that, after the roadways are repaired, they will implement a "no-cut" policy for at least 5 years.

Costs for water service line and meter replacements, both inside and outside of the LHD project area, are listed in **Table 3-7**. Detailed opinions of probable cost are included in **Appendix 3-B**.

Table 3-7 – Cost Summary for Water Service and Meter Replacements

Item	Improvements Summary	Approximate Capital Cost (a)
Replace water meters only	• 360 new meters • 120 radio read heads	$520,000
Replace Water Services and Meters in the LHD Project Area – Services and Meters in Affected Roadways Only	• Replace water meters and service lines for services in the LHD 2023 project area. • Replace only services connected to water mainlines in roadways scheduled for replacement by LHD. • Approximately 110 services and meters replaced.	$670,000
Replace Water Services and Meters in the LHD Project Area – Services and Meters in Unaffected Roadways Only	• Replace water meters and service lines for services in the LHD 2023 project area. • Replace only services connected to water mainlines in roadways not scheduled for replacement by LHD. • Approximately 97 services and meters replaced.	$590,000
Replace Water Services and Meters in the LHD Project Area – Services and Meters Outside the LHD Project Area	• Replace water meters and service lines for the remainder of the District outside the LHD 2023 project area. • Approximately 273 services and meters replaced.(b)	$1,650,000

(a) Approximate capital cost in 2019 dollars assuming 20 percent contingency. Includes project design, construction management, prevailing wages, and American Iron and Steel requirements.
(b) Note: inactive services (45) not included

3.5.4 Replace Existing Transmission Mains

The transmission mains that connect the well sources to the existing main storage facility in the Farragut area have historically been the source of leaks over the years. Since most of these lines are the original lead-caulked jointed cast iron from the 1940s, they continue to age and the leaks become more prevalent.

In discussions with the local contractor that has repaired many of these joints for the District over the past 20 years, they indicated that over the years the lead backing ring begins to separate from the joint allowing it to leak. Previously, the District would excavate the leaking joint and tap the lead ring back into place to stop the leaking. However, in more recent years, the District began using a commercially available clamp made for this purpose to more effectively repair the leak with a longer lasting solution. The contractor indicated that based on their experience, the cost to repair a single joint with the clamp would be estimated at around $1,500 each.

As evidenced by the large amount of non-revenue water that the District has, these leaks may be significant and will undoubtedly continue to increase as the pipe continues to age. To effectively reduce the leaks in the transmission line, most of the pipe should either be repaired or replaced. The portion of transmission line from Well 8 to the shared transmission line is newer PVC from the 1980s and not believed to be leaking.

This transmission main is broken into three segments:

1. 2,000 feet of 10” line from Well #7 to the junction with the Farragut Tank.
2. 2,000 feet of 12” line from the tank junction to the Farragut Tank.
3. 1,200 feet of 12” line from the tank junction to the distribution system.

Segments 1 and 2 would be replaced in their current locations. Segment 3 could have alternate alignment.

A potential route for this new transmission main would be from along an existing overhead power line corridor that parallels Highway 54. This land is administered by the Idaho Department of Fish and Game (IDFG) and the local administration has indicated a willingness to work with the District on obtaining the needed easement, especially if the route was the same as the power utility corridor. The cost (if any) is not believed to be significant for processing this easement through IDFG.

The Capital Costs for each segment are (assuming 20% contingency):

1. $325,000
2. $350,000
3. $220,000

Detailed opinions of probable cost are included in **Appendix 3-B**.

3.5.6 New Distribution Main

A new distribution line that would connect the transmission line to the new tank would improve fire flow and allow for higher pressures to feed the Northwest portion of the District, and could also serve a tank on the North side of the District. The most logical path for this line would be along the west side of Bayview to avoid costly asphalt surface repair and easily connect to the existing water system.

Based on Kootenai County information, there is a public right-of-way along the west side of Bayview that could be utilized for this route. Another potential route would be west on land that IDFG administers. The IDFG fencing in this area is set about 50-feet back from the property line and there is an existing overhead utility corridor in this location. The local IDFG has indicated a willingness to work with the District on obtaining an easement in this location, especially if it can be located near or within an already disturbed and cleared area. However, further discussions with IDFG would be necessary to finalize this location.

This line could also eliminate some of the existing small diameter piping and dead-end mains. Several new PRVs would need to be installed at connections with existing pipes to protect the lower elevations of the District.

Depending on where a new tank would be sited, the length of necessary pipe could change.
The estimated cost for approximately 5,400 feet of new 12-inch PVC distribution main, include new PRV stations, is approximately $1,250,000. A detailed opinion of probable cost is included in **Appendix 3-B**.

3.5.7 New Distribution Main Extension to Dromore

If the new distribution line is constructed to the west of the District, a new distribution pipeline could be extended to the Dromore area to increase pressure and flow to residents in the Dromore area. This extension would allow the District to abandon the existing Dromore Tank and booster station. A least one new PRV station would be required to connect the distribution system main extension to the existing system. The estimated cost for approximately 2,400 LF of new 12-inch PVC distribution main, include a new PRV station, is $275,000. A detailed opinion of probable cost is included in **Appendix 3-B**.

3.5.8 Small Diameter Main and System Looping

The District has a number of small pipelines defined as less than 6-inch in diameter. These small pipelines reduce available flow and result in low pressures during maximum day and peak hour demands. Most of the low pressure areas are served by 2-inch diameter and/or dead-end lines where the increased headloss through the small lines may cause a significant pressure drop. Despite the potential for low pressures, it should be noted that the District generally does not receive very many customer complaints related to low system pressures.

Upsizing all distribution lines to a minimum size of 6-inch diameter would address the calculated deficiency. However, this would be a considerable expense as the District has over 5,000-feet of 2-inch 16,100 feet of 4-inch and 4,200 feet of 5-inch pipeline. The smallest lines are generally limited to short runs where the line only serves a few houses. In addition, they are generally in areas where they are also dead-end lines. While degradation of water quality at the end of dead-ends mains is always a concern, the District does not appear to experience this in a widespread manner. This is most likely due to the systematic flushing by the District and that most dead-end lines are small diameter and have homes located near the end of the line.

While upgrades to pipe size and improved looping should always be considered, the District has indicated a preference, based on resounding input from their customers, to focus on the portions of their that appear to be in immediate need. Future system looping improvements could be completed in conjunction with upsizing small pipelines or performed as a separate project. As the system grows with increased development, this should especially be considered every time a subdivision or new connection is requested to the system in the future. In addition, the known low-pressure areas (Post Office, Dromore) are mainly a factor of their elevation in the lower pressure zone and these areas can be addressed by the construction of some of the improvements listed here.

For planning purposes, costs for replacing all of the District's 2-inch, 4-inch and 5-inch diameter pipelines with 6-inch diameter pipelines are included in **Table 3-8**. A detailed opinion of probable cost is included in **Appendix 3-B**.

Table 3-8 – Cost Summary for Upsizing 2-Inch, 4-Inch, and 5-Inch Diameter Pipelines

Item	Improvements Summary	Approximate Capital Cost [(a)]
Upsize All 2-Inch	• Upsize all existing 2-inch diameter pipelines to 6-inch diameter (approximately 5,100 linear feet).	$910,000
Upsize All 4-Inch	• Upsize all existing 4-inch diameter pipelines to 6-inch diameter (approximately 16,100 linear feet).	$2,870,000
Upsize all 5-inch	• Upsize all existing 5-inch diameter pipelines to 6 inch diameter (approximately 4,200 linear feet).	$780,000

(a) Approximate capital cost in 2019 dollars assuming 20 percent contingency. Includes project design, construction management, prevailing wages, and American Iron and Steel requirements.

3.5.9 Summary of Improvement Options

Improvements for the District's water distribution discussed in the preceding sections, as well as the corresponding costs, are summarized in **Table 3-9**. Detailed opinions of probable cost are included in **Appendix 3-B**.

Table 3-9 – Summary of Recommended Improvements for Distribution

Item	Improvements Summary	Approximate Capital Cost [(a)]
General Improvements	• Tune and rebuild existing PRVs for system optimization.	$83,000
Water Meter Replacement	• Upgrade 360 meters to new radio-read meters. • Add radio-read heads to 120 existing meters. • Upgrade meter-reading devices and software.	$520,000
Water Meter and Service Line Replacement	• Replace water meters service lines for services in the LHD 2023 project area. • Replace only services connected to water mainlines in roadways scheduled for replacement by LHD. • Approximately 110 services and meters replaced.	$670,000
	• Replace water meters service lines for services in the LHD 2023 project area. • Replace only services connected to water mainlines in roadways not scheduled for replacement by LHD. • Approximately 97 services and meters replaced.	$590,000
	• Replace water meters service lines for the remainder of the District outside the LHD 2023 project area. • Approximately 273 services and meters replaced.	$1,650,000
Replace Existing WellTransmission Main	• Replace the transmission line in the Farragut area from Well #7 to the tank junction.	$325,000

Item	Improvements Summary	Approximate Capital Cost (a)
Replace Existing Tank Transmission Main	• Replace the transmission line from the tank junction to the Farragut Tank.	$350,000
New Transmission Main	• Replace the leaking transmission main in Farragut area and install a new transmission line from the tank junction to the District's distribution network.	$220,000
New Distribution Main	• Install new distribution main along the west side of Bayview to connect the new transmission line to a new storage tank site (final location to-be-determined).	$1,250,000
New Distribution Main Extension to Dromore Area	• Extend the new Distribution Main from the location of a potential new storage tank to the Dromore area for improved flow and pressure. • Install a new PRV station and replace existing PRVs.	$275,000
Upsize Undersized Mainlines	• Upsize all existing 2-inch diameter pipelines to 6-inch diameter (approximately 5,100 linear feet).	$840,000
	• Upsize all existing 4-inch diameter pipelines to 6-inch diameter (approximately 16,100 linear feet).	$2,650,000
	• Upsize all existing 5" diameter steel pipelines to 6" diameter (approximately 4,200 linear feet).	$725,000

(a) Approximate capital cost in 2019 dollars assuming 20 percent contingency. Includes project design, construction management, prevailing wages, and American Iron and Steel requirements.

Appendices

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Appendix 3-A

Opinions of Probable Cost – Storage

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Master date for all sheets
Sep-19

Bayview Water & Sewer District - Water System - Storage
TM3: BWSD Water System Alternatives

Project: Bayview Water and Sewer District Water System Facility Plan
Client: Bayview Water and Sewer District
System: Storage

No.	Link to Detailed Sheet	Option	Description	Capital Cost	O&M Cost (20-Yr Present Worth)	Total Present Worth Cost
1	General Improvements	General Improvements	SCADA Upgrades	$23,000	--	$23,000
2	Rehab Farragut Tank - Crack Seal	Rehabilitate Existing Farragut Storage Tank	Rehabilitate Existing Farragut Storage Tank with Epoxy Injection Crack Sealing	$311,000	$37,000	$348,000
3	Rehab Farragut Tank - Crack Seal + Liner	Rehabilitate Existing Farragut Storage Tank	Rehabilitate Existing Farragut Storage Tank with Epoxy Injection Crack Sealing and a Geomembrane Liner	$547,000	--	$547,000
4	Rehab Farragut Tank - Crack Seal + Coatings	Rehabilitate Existing Farragut Storage Tank	Rehabilitate Existing Farragut Storage Tank with Epoxy Injection Crack Sealing and an Interior and Exterior Coating	$752,000	--	$752,000
5	New Bolted Steel Tank to Replace Farragut Tank	New Storage Tank to Replace Farragut Tank	Construct a new 300,000 gallon bolted-steel storage tank to replace existing Farragut Tank + 1100 LF of 12" pipe	$1,201,000	$33,000	$1,234,000
6	New Welded Steel Tank to Replace Farragut Tank	New Storage Tank to Replace Farragut Tank	Construct a new 300,000 gallon welded-steel storage tank to replace existing Farragut Tank + 1100 LF of 12" pipe	$1,297,000	$0	$1,297,000
7	New Pre-Stressed Concrete Tank to Replace Farragut Tank	New Storage Tank to Replace Farragut Tank	Construct a new 300,000 gallon pre-stressed concrete storage tank to replace existing Farragut Tank + 1100 LF of 12" pipe	$3,041,000	--	$3,041,000
8	New Cast-in-Place Concrete Tank to Replace Farragut Tank	New Storage Tank to Replace Farragut Tank	Construct a new 300,000 gallon traditional cast-in-place concrete storage tank to replace existing Farragut Tank + 1100 LF of 12" pipe	$1,453,000	--	$1,453,000
9	New Bolted Steel Tank to Replace Dromore Tank	New Dromore Storage Tank and Booster Station	Construct a new 65,000 gallon bolted-steel storage tank to replace existing Dromore Tank and add one booster pump	$340,000	$33,000	$373,000
10	New Welded Steel Tank to Replace Dromore Tank	New Dromore Storage Tank and Booster Station	Construct a new 65,000 gallon welded-steel storage tank to replace existing Dromore Tank and add one booster pump	$377,000	$0	$377,000
11	New Pre-Stressed Concrete Tank to Replace Dromore Tank	New Dromore Storage Tank and Booster Station	Construct a new 65,000 gallon pre-stressed concrete storage tank to replace existing Dromore Tank and add one new booster pump	$783,000	--	$783,000
12	New Cast-in-Place Concrete Tank to Replace Dromore Tank	New Dromore Storage Tank and Booster Station	Construct a new 65,000 gallon traditional cast-in-place concrete storage tank to replace existing Dromore Tank and add one booster pump	$410,000	--	$410,000

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - General Improvements

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	SCADA upgrades	1	EA	$10,000	$10,000
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$1,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			25.0%	$3,000
19	Bonding			2.5%	$300
20	Contractor overhead and profit			10.0%	$1,000
				SUBTOTAL	**$ 15,000**
				Contingency: 20%	$ 3,000
				Prevailing Wages & AIS: 7.5%	$ 1,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 4,000
				Legal and Administrative: 1%	$ -
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 23,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - Rehabilitate Existing Storage Tank - Epoxy Injection Crack Sealing

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES QNTY	UNIT	UNIT PRICE	TOTAL COST
1	Crack Rehabilitation via Epoxy Injection	1,800	LF	$35	$63,000
2	OSHA Compliance - Interior Stairs, Exterior Platform, Etc.	1	LS	$50,000	$50,000
3	Replace Existing Overflow Piping	1	LS	$25,000	$25,000
4	Replace Existing Control Valves	1	LS	$25,000	$25,000
5	Temporary Piping Modification for Construction	1	LS	$15,000	$15,000
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$18,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$4,000
20	Contractor overhead and profit			10.0%	$18,000
				SUBTOTAL	**$ 218,000**
				Contingency: 20%	$ 44,000
				Prevailing Wages & AIS: 7.5%	$ 20,000
				State Sales Tax: N/A	-
				Design / CMS: 10%	$ 26,000
				Legal and Administrative: 1%	$ 3,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 311,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - Rehabilitate Existing Storage Tank - Epoxy Injection Crack Sealing

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	Crack Rehabilitation		Other Improvements		Present Worth	
	Capital Cost	$63,000	Capital Cost	$115,000		
	Maintenance / yr	2.5%	Maintenance / yr	0.5%		
	Increased use / yr	0.0%	Increased use / yr	0.0%		Discount Rate 1.500%
Year		**Cost in Year *i***		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$1,575		$575	$2,150	$2,150
2		$1,575		$575	$2,150	$2,118
3		$1,575		$575	$2,150	$2,087
4		$1,575		$575	$2,150	$2,056
5		$1,575		$575	$2,150	$2,026
6		$1,575		$575	$2,150	$1,996
7		$1,575		$575	$2,150	$1,966
8		$1,575		$575	$2,150	$1,937
9		$1,575		$575	$2,150	$1,909
10		$1,575		$575	$2,150	$1,880
11		$1,575		$575	$2,150	$1,853
12		$1,575		$575	$2,150	$1,825
13		$1,575		$575	$2,150	$1,798
14		$1,575		$575	$2,150	$1,772
15		$1,575		$575	$2,150	$1,745
16		$1,575		$575	$2,150	$1,720
17		$1,575		$575	$2,150	$1,694
18		$1,575		$575	$2,150	$1,669
19		$1,575		$575	$2,150	$1,645
20		$1,575		$575	$2,150	$1,620
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)						**$ 37,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT:
Bayview Water and Sewer District Water System Facility Plan

PROJECT DESCRIPTION:
Storage - Rehabilitate Existing Storage Tank - Epoxy Crack Seal + Geomembrane Liner

CLIENT:
Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	New Geomembrane Liner	1	LS	$90,000	$90,000
2	Mark-up and installation			25.0%	$22,500
3	Crack Rehabilitation via Epoxy Injection	1,800	LF	$35	$63,000
4	Interior Concrete Surface Preparation and Cleaning	4,700	SF	$5	$23,500
5	OSHA Compliance - Interior Stairs, Exterior Platform, Etc.	1	LS	$50,000	$50,000
6	Replace Existing Overflow Piping	1	LS	$25,000	$25,000
7	Replace Existing Control Valves	1	LS	$25,000	$25,000
8	Temporary Piping Modification for Construction	1	LS	$15,000	$15,000
9					
10					
11					
12					
13	Additional Elements (estimated % of above)				
14	Contractor mobilization and administration			10.0%	$31,000
15	Yard Piping			0.0%	$0
16	Site Civil			0.0%	$0
17	Electrical and instrumentation			0.0%	$0
18	Bonding			2.5%	$8,000
19	Contractor overhead and profit			10.0%	$31,000
				SUBTOTAL	**$ 384,000**
				Contingency: 20%	$ 77,000
				Prevailing Wages & AIS: 7.5%	$ 35,000
				State Sales Tax: N/A	-
				Design / CMS: 10%	$ 46,000
				Legal and Administrative: 1%	$ 5,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 547,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - Rehabilitate Existing Storage Tank - Epoxy Crack Seal + Geomembrane Liner

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

Year	Crack Rehabilitation + Liner		Other Improvements		Present Worth	
	Capital Cost	$176,500	Capital Cost	$100,000		
	Maintenance / yr	0.0%	Maintenance / yr	1.0%		
	Increased use / yr	0.0%	Increased use / yr	0.0%		Discount Rate 1.500%
Year		**Cost in Year *i***		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$0		$1,000	$1,000	$1,000
2		$0		$1,000	$1,000	$985
3		$0		$1,000	$1,000	$971
4		$0		$1,000	$1,000	$956
5		$0		$1,000	$1,000	$942
6		$0		$1,000	$1,000	$928
7		$0		$1,000	$1,000	$915
8		$0		$1,000	$1,000	$901
9		$0		$1,000	$1,000	$888
10		$0		$1,000	$1,000	$875
11		$0		$1,000	$1,000	$862
12		$0		$1,000	$1,000	$849
13		$0		$1,000	$1,000	$836
14		$0		$1,000	$1,000	$824
15		$0		$1,000	$1,000	$812
16		$0		$1,000	$1,000	$800
17		$0		$1,000	$1,000	$788
18		$0		$1,000	$1,000	$776
19		$0		$1,000	$1,000	$765
20		$0		$1,000	$1,000	$754
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)						**$ 17,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: **DATE:** 9/1/2019

Bayview Water and Sewer District Water System Facility Plan

PROJECT DESCRIPTION:

Storage - Rehabilitate Existing Storage Tank - Crack Sealing + New Interior and Exterior Coatings

CLIENT:

Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	Interior Surface Prep and Coating - Epoxy	4,700	SF	$25	$117,500
2	Exterior Surface Prep and Coating - Acrylate	13,200	SF	$15	$198,000
3	OSHA Compliance - Interior Stairs, Exterior Platform, Etc.	1	LS	$50,000	$50,000
4	Replace Existing Overflow Piping	1	LS	$25,000	$25,000
5	Replace Existing Control Valves	1	LS	$25,000	$25,000
6	Temporary Piping Modification for Construction	1	LS	$15,000	$15,000
7					
8					
9					
10					
11					
12					
13	Additional Elements (estimated % of above)				
14	Contractor mobilization and administration			10.0%	$43,000
15	Yard Piping			0.0%	$0
16	Site Civil			0.0%	$0
17	Electrical and instrumentation			0.0%	$0
18	Bonding			2.5%	$11,000
19	Contractor overhead and profit			10.0%	$43,000

SUBTOTAL	**$**	**528,000**
Contingency: 20%	$	106,000
Prevailing Wages & AIS: 7.5%	$	48,000
State Sales Tax: N/A		-
Design / CMS: 10%	$	63,000
Legal and Administrative: 1%	$	7,000
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**752,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - Rehabilitate Existing Storage Tank - Crack Sealing + New Interior and Exterior Coatings

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	Crack Rehabilitation + Coating		Other Improvements		Present Worth	
	Capital Cost	$365,500	Capital Cost	$65,000		
	Maintenance / yr	0.0%	Maintenance / yr	0.0%		
	Increased use / yr	0.0%	Increased use / yr	0.0%		Discount Rate 1.500%
Year		**Cost in Year *i***		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$0		$0	$0	$0
2		$0		$0	$0	$0
3		$0		$0	$0	$0
4		$0		$0	$0	$0
5		$0		$0	$0	$0
6		$0		$0	$0	$0
7		$0		$0	$0	$0
8		$0		$0	$0	$0
9		$0		$0	$0	$0
10		$0		$0	$0	$0
11		$0		$0	$0	$0
12		$0		$0	$0	$0
13		$0		$0	$0	$0
14		$0		$0	$0	$0
15		$0		$0	$0	$0
16		$0		$0	$0	$0
17		$0		$0	$0	$0
18		$0		$0	$0	$0
19		$0		$0	$0	$0
20		$0		$0	$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)						**$ -**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Bolted Steel Tank to Replace the Existing Farragut Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	305,000 Gallon Bolted Steel Water Tank - Glass Fused	305,000	GAL	$1.35	$411,750
2	Storage Tank Foundation	1	LS	$50,000	$50,000
3	Access Road Improvements for Tank Construction	1	LS	$15,000	$15,000
4	12" C-900 PVC Water Main	1100	LF	$85	$93,500
5	Misc. Surface Repair	1100	LF	$5	$5,500
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$58,000
16	Yard Piping			5.0%	$29,000
17	Site Civil			2.5%	$14,000
18	Electrical and instrumentation			5.0%	$29,000
19	Bonding			2.5%	$14,000
20	Contractor overhead and profit			10.0%	$58,000

SUBTOTAL	**$**	**778,000**
Contingency: 20%	$	156,000
Prevailing Wages & AIS: 7.5%	$	70,000
State Sales Tax: N/A		-
Design / CMS: 20%	$	187,000
Legal and Administrative: 1%	$	10,000
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**1,201,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Bolted Steel Tank to Replace the Existing Farragut Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

Year	General Maintenance	Bolt Inspections	Present Worth	
	Capital Cost $461,750 Maintenance / yr 0.0% Increased use / yr 0.0%	Year 1 Cost $5,000 Cost Inflation 2.5%		Discount Rate 1.500%
	Cost in Year *i*	**Cost in Year *i***	**Total by Year**	**Present Worth**
1	$0		$0	$0
2	$0		$0	$0
3	$0	$5,253	$5,253	$5,099
4	$0		$0	$0
5	$0		$0	$0
6	$0	$5,657	$5,657	$5,251
7	$0		$0	$0
8	$0		$0	$0
9	$0	$6,092	$6,092	$5,408
10	$0		$0	$0
11	$0		$0	$0
12	$0	$6,560	$6,560	$5,569
13	$0		$0	$0
14	$0		$0	$0
15	$0	$7,065	$7,065	$5,736
16	$0		$0	$0
17	$0		$0	$0
18	$0	$7,608	$7,608	$5,907
19	$0		$0	$0
20	$0		$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ 33,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Welded Steel Tank to Replace the Existing Farragut Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	305,000 Gallon Welded Steel Water Tank	305,000	GAL	$1.50	$457,500
2	Storage Tank Foundation	1	LS	$50,000	$50,000
3	Access Road Improvements for Tank Construction	1	LS	$15,000	$15,000
4	12" C-900 PVC Water Main	1100	LF	$85	$93,500
5	Misc. Surface Repair	1100	LF	$5	$5,500
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$62,000
16	Yard Piping			5.0%	$31,000
17	Site Civil			2.5%	$16,000
18	Electrical and instrumentation			5.0%	$31,000
19	Bonding			2.5%	$16,000
20	Contractor overhead and profit			10.0%	$62,000

SUBTOTAL	**$**	**840,000**
Contingency: 20%	$	168,000
Prevailing Wages & AIS: 7.5%	$	76,000
State Sales Tax: N/A		-
Design / CMS: 20%	$	202,000
Legal and Administrative: 1%	$	11,000
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**1,297,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Welded Steel Tank to Replace the Existing Farragut Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	General Maintenance		**Present Worth**	
	Capital Cost	$507,500		
	Maintenance / yr	0.00%		
	Increased use / yr	0.0%		Discount Rate
				1.500%
Year		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$0	$0	$0
2		$0	$0	$0
3		$0	$0	$0
4		$0	$0	$0
5		$0	$0	$0
6		$0	$0	$0
7		$0	$0	$0
8		$0	$0	$0
9		$0	$0	$0
10		$0	$0	$0
11		$0	$0	$0
12		$0	$0	$0
13		$0	$0	$0
14		$0	$0	$0
15		$0	$0	$0
16		$0	$0	$0
17		$0	$0	$0
18		$0	$0	$0
19		$0	$0	$0
20		$0	$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ -**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan **DATE:** 9/1/2019

PROJECT DESCRIPTION: Storage - New Pre-Stressed Concrete Tank to Replace the Existing Farragut Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	305,000 Gallon Prestressed Concrete Water Tank & Foundation	305,000	GAL	$4.25	$1,296,250
2	Storage Tank Foundation	1	LS	$50,000	$50,000
3	Access Road Improvements for Tank Construction	1	LS	$15,000	$15,000
4	12" C-900 PVC Water Main	1100	LF	$85	$93,500
5	Misc. Surface Repair	1100	LF	$5	$5,500
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$146,000
16	Yard Piping			5.0%	$73,000
17	Site Civil			2.5%	$37,000
18	Electrical and instrumentation			5.0%	$73,000
19	Bonding			2.5%	$37,000
20	Contractor overhead and profit			10.0%	$146,000

SUBTOTAL	**$**	**1,972,000**
Contingency: 20%	$	394,000
Prevailing Wages & AIS: 7.5%	$	177,000
State Sales Tax: N/A		-
Design / CMS: 20%	$	473,000
Legal and Administrative: 1%	$	25,000
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**3,041,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Pre-Stressed Concrete Tank to Replace the Existing Farragut Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	General Maintenance		Present Worth	
	Expected per Year	$0		
	Increased use / yr	0.0%		Discount Rate 1.500%
Year		Cost in Year *i*	Total by Year	Present Worth
1		$0	$0	$0
2		$0	$0	$0
3		$0	$0	$0
4		$0	$0	$0
5		$0	$0	$0
6		$0	$0	$0
7		$0	$0	$0
8		$0	$0	$0
9		$0	$0	$0
10		$0	$0	$0
11		$0	$0	$0
12		$0	$0	$0
13		$0	$0	$0
14		$0	$0	$0
15		$0	$0	$0
16		$0	$0	$0
17		$0	$0	$0
18		$0	$0	$0
19		$0	$0	$0
20		$0	$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ -**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Cast-in-Place Concrete Tank to Replace the Existing Farragut Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	305,000 Gallon Cast-in-Place Reinforced Concrete Water Tank	305,000	GAL	$1.75	$533,750
2	Storage Tank Foundation	1	LS	$50,000	$50,000
3	Access Road Improvements for Tank Construction	1	LS	$15,000	$15,000
4	12" C-900 PVC Water Main	1100	LF	$85	$93,500
5	Misc. Surface Repair	1100	LF	$5	$5,500
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$70,000
16	Yard Piping			5.0%	$35,000
17	Site Civil			2.5%	$17,000
18	Electrical and instrumentation			5.0%	$35,000
19	Bonding			2.5%	$17,000
20	Contractor overhead and profit			10.0%	$70,000
				SUBTOTAL	**$ 942,000**
				Contingency: 20%	$ 188,000
				Prevailing Wages & AIS: 7.5%	$ 85,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 226,000
				Legal and Administrative: 1%	$ 12,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 1,453,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Cast-in-Place Concrete Tank to Replace the Existing Farragut Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	General Maintenance		Present Worth	
	Capital Cost	$583,750		
	Maintenance / yr	0.0%		
	Increased use / yr	0.0%		Discount Rate
				1.500%
Year		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$0	$0	$0
2		$0	$0	$0
3		$0	$0	$0
4		$0	$0	$0
5		$0	$0	$0
6		$0	$0	$0
7		$0	$0	$0
8		$0	$0	$0
9		$0	$0	$0
10		$0	$0	$0
11		$0	$0	$0
12		$0	$0	$0
13		$0	$0	$0
14		$0	$0	$0
15		$0	$0	$0
16		$0	$0	$0
17		$0	$0	$0
18		$0	$0	$0
19		$0	$0	$0
20		$0	$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ -**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Bolted Steel Tank to Replace the Existing Dromore Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES QNTY	UNIT	UNIT PRICE	TOTAL COST
1	65,000 Gallon Bolted Steel Water Tank - Glass Fused	65,000	GAL	$1.75	$113,750
2	Storage Tank Foundation	1	LS	$30,000	$30,000
3	Access Road Improvements for Tank Construction	1	LS	$15,000	$15,000
4	New Booster Pump	1	EA	$5,000	$5,000
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$16,000
16	Yard Piping			5.0%	$8,000
17	Site Civil			2.5%	$4,000
18	Electrical and instrumentation			5.0%	$8,000
19	Bonding			2.5%	$4,000
20	Contractor overhead and profit			10.0%	$16,000
				SUBTOTAL	**$ 220,000**
				Contingency: 20%	$ 44,000
				Prevailing Wages & AIS: 7.5%	$ 20,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 53,000
				Legal and Administrative: 1%	$ 3,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 340,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Bolted Steel Tank to Replace the Existing Dromore Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	General Maintenance		Bolt Inspections		Present Worth	
	Capital Cost	$148,750	Year 1 Cost	$5,000		
	Maintenance / yr	0.0%	Cost Inflation	2.5%		
	Increased use / yr	0.0%				Discount Rate 1.500%
Year		**Cost in Year *i***		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$0			$0	$0
2		$0			$0	$0
3		$0		$5,253	$5,253	$5,099
4		$0			$0	$0
5		$0			$0	$0
6		$0		$5,657	$5,657	$5,251
7		$0			$0	$0
8		$0			$0	$0
9		$0		$6,092	$6,092	$5,408
10		$0			$0	$0
11		$0			$0	$0
12		$0		$6,560	$6,560	$5,569
13		$0			$0	$0
14		$0			$0	$0
15		$0		$7,065	$7,065	$5,736
16		$0			$0	$0
17		$0			$0	$0
18		$0		$7,608	$7,608	$5,907
19		$0			$0	$0
20		$0			$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)						**$ 33,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Welded Steel Tank to Replace the Existing Dromore Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	65,000 Gallon Welded Steel Water Tank	65,000	GAL	$2.00	$130,000
2	Storage Tank Foundation	1	LS	$30,000	$30,000
3	Access Road Improvements for Tank Construction	1	LS	$15,000	$15,000
4	New Booster Pump	1	EA	$5,000	$5,000
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$18,000
16	Yard Piping			5.0%	$9,000
17	Site Civil			2.5%	$5,000
18	Electrical and instrumentation			5.0%	$9,000
19	Bonding			2.5%	$5,000
20	Contractor overhead and profit			10.0%	$18,000

SUBTOTAL	**$**	**244,000**
Contingency: 20%	$	49,000
Prevailing Wages & AIS: 7.5%	$	22,000
State Sales Tax: N/A		-
Design / CMS: 20%	$	59,000
Legal and Administrative: 1%	$	3,000
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**377,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water		**DATE:**	9/1/2019
PROJECT DESCRIPTION: Storage - New Welded Steel Tank to Replace the Existing Dromore Tank			
CLIENT: Bayview Water and Sewer District			
CLIENT PROJ. NO.			

	General Maintenance		**Present Worth**	
	Capital Cost	$165,000		
	Maintenance / yr	0.0%		
	Increased use / yr	0.0%		Discount Rate 1.500%
Year		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$0	$0	$0
2		$0	$0	$0
3		$0	$0	$0
4		$0	$0	$0
5		$0	$0	$0
6		$0	$0	$0
7		$0	$0	$0
8		$0	$0	$0
9		$0	$0	$0
10		$0	$0	$0
11		$0	$0	$0
12		$0	$0	$0
13		$0	$0	$0
14		$0	$0	$0
15		$0	$0	$0
16		$0	$0	$0
17		$0	$0	$0
18		$0	$0	$0
19		$0	$0	$0
20		$0	$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ -**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Pre-Stressed Concrete Tank to Replace the Existing Dromore Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES QNTY	UNIT	UNIT PRICE	TOTAL COST
1	65,000 Gallon Prestressed Concrete Water Tank & Foundation	65,000	GAL	$5.00	$325,000
2	Storage Tank Foundation	1	LS	$30,000	$30,000
3	Access Road Improvements for Tank Construction	1	LS	$15,000	$15,000
4	New Booster Pump	1	EA	$5,000	$5,000
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$38,000
16	Yard Piping			5.0%	$19,000
17	Site Civil			2.5%	$9,000
18	Electrical and instrumentation			5.0%	$19,000
19	Bonding			2.5%	$9,000
20	Contractor overhead and profit			10.0%	$38,000
				SUBTOTAL	**$ 507,000**
				Contingency: 20%	$ 101,000
				Prevailing Wages & AIS: 7.5%	$ 46,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 122,000
				Legal and Administrative: 1%	$ 7,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 783,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Pre-Stressed Concrete Tank to Replace the Existing Dromore Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	General Maintenance		Present Worth	
	Capital Cost	$345,000		
	Maintenance / yr	0.0%		
	Increased use / yr	0.0%		Discount Rate
				1.500%
Year		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$0	$0	$0
2		$0	$0	$0
3		$0	$0	$0
4		$0	$0	$0
5		$0	$0	$0
6		$0	$0	$0
7		$0	$0	$0
8		$0	$0	$0
9		$0	$0	$0
10		$0	$0	$0
11		$0	$0	$0
12		$0	$0	$0
13		$0	$0	$0
14		$0	$0	$0
15		$0	$0	$0
16		$0	$0	$0
17		$0	$0	$0
18		$0	$0	$0
19		$0	$0	$0
20		$0	$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ -**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Cast-in-Place Concrete Tank to Replace the Existing Dromore Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	65,000 Gallon Cast-in-Place Reinforced Concrete Water Tank	65,000	GAL	$2.25	$146,250
2	Storage Tank Foundation	1	LS	$30,000	$30,000
3	Access Road Improvements for Tank Construction	1	LS	$15,000	$15,000
4	New Booster Pump	1	EA	$5,000	$5,000
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$20,000
16	Yard Piping			5.0%	$10,000
17	Site Civil			2.5%	$5,000
18	Electrical and instrumentation			5.0%	$10,000
19	Bonding			2.5%	$5,000
20	Contractor overhead and profit			10.0%	$20,000
				SUBTOTAL	**$ 266,000**
				Contingency: 20%	$ 53,000
				Prevailing Wages & AIS: 7.5%	$ 24,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 64,000
				Legal and Administrative: 1%	$ 3,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 410,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water

DATE: 9/1/2019

PROJECT DESCRIPTION: Storage - New Cast-in-Place Concrete Tank to Replace the Existing Dromore Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	General Maintenance		Present Worth	
	Capital Cost	$181,250		
	Maintenance / yr	0.0%		
	Increased use / yr	0.0%		Discount Rate
				1.500%
Year		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$0	$0	$0
2		$0	$0	$0
3		$0	$0	$0
4		$0	$0	$0
5		$0	$0	$0
6		$0	$0	$0
7		$0	$0	$0
8		$0	$0	$0
9		$0	$0	$0
10		$0	$0	$0
11		$0	$0	$0
12		$0	$0	$0
13		$0	$0	$0
14		$0	$0	$0
15		$0	$0	$0
16		$0	$0	$0
17		$0	$0	$0
18		$0	$0	$0
19		$0	$0	$0
20		$0	$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ -**

Appendix 3-B

Opinions of Probable Cost – Transmission/Distribution

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Project: Bayview Water and Sewer District Water System Facility Plan
Client: Bayview Water and Sewer District
System: Transmission/Distribution

Link to Detailed Sheet	Option	Description	Capital Cost	O&M Cost (20-Yr Present Worth)	Total Present Worth Cost
General Improvements	General Improvements	Rebuild/Tune Existing PRVs; Add pressure relief valves to booster station discharges	$75,600	--	$75,600
Water Meter Replacement	Water Meter Replacement	Replace existing old meters (no service lines) and add radio-read heads to newer meters	$518,000	--	$518,000
Water Meter & Service Line Replacement - In LHD Paving Area; In Affected Roadway	Water Meter & Service Line Replacement	Water Meter & Service Line Replacement for services in the LHD 2023 project area; Services are connected to water mainlines in roads scheduled for replacement by LHD. Total Meters = 110.	$664,000	--	$664,000
Water Meter & Service Line Replacement - In LHD Paving Area; Not In Affected Roadway	Water Meter & Service Line Replacement	Water Meter & Service Line Replacement for services in the LHD 2023 project area; Services are connected to water mainlines in roads not scheduled for replacement by LHD. Total Meters = 97	$586,000	--	$586,000
Water Meter & Service Line Replacement - All Other Services Outside LHD Paving Area	Water Meter & Service Line Replacement	Water Meter & Service Line Replacement for services in the rest of the Water District outside the LHD Project Area. Total Meters = 318	$1,648,000	--	$1,648,000
Replace Well #7 Trans Main	Replace Existing Transmission Main (Well #7)	10" transmission main from Well #7 to the Farragut Tank junction.	$327,000	--	$327,000
Replace Tank Trans Main	Replace Existing Transmission Main (To Farragut Tank)	12" transmission main from tank junction to the Farragut Tank.	$347,000	--	$347,000
New Trans Main (Tank-Bayview)	New Transmission Main (To Bayview)	New 12" transmission main from Farragut Tank junction to Bayview	$213,000	--	$213,000
New Distribution Main	New Distribution Main	New distribution main from the south side of Bayview along the west side of town to the north hillside.	$1,252,000	--	$1,252,000
Distribution Extension to Dromore	New Distribution Main	Additional length of distribution main to the Dromore Booster/	$276,000	--	$276,000
Upsize 2" Pipes to 6"	Water Mainline Replacement	Upsize all Existing 2-inch Diameter Lines to 6-inch Diameter	$838,000	--	$838,000
Upsize 4" Pipes to 6"	Water Mainline Replacement	Upsize all Existing 4-inch Diameter Lines to 6-inch Diameter	$2,647,000	--	$2,647,000
Upsize 5" Pipes to 6"	Water Mainline Replacement	Upsize all Existing 5-inch Diameter Lines to 6-inch Diameter	$722,000	--	$722,000

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan — **DATE:** 9/1/2019

PROJECT DESCRIPTION: General Distribution System Improvements

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	Existing PRV Tuning/Rebuilds	4	EA	$5,000	$20,000
2	Pressure Relief Valves for Booster Station Discharges	4	EA	$5,000	$20,000
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$4,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$1,000
20	Contractor overhead and profit			10.0%	$4,000

SUBTOTAL	**$ 49,000**
Contingency: 20%	$ 10,000
Prevailing Wages & AIS: 7.5%	$ 4,000
State Sales Tax: N/A	-
Design / CMS: 20%	$ 12,000
Legal and Administrative: 1%	$ 600
TOTAL PROBABLE COST (2019 DOLLARS)	**$ 75,600**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Distribution - New Water Meters

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	Water Meters - 3/4-inch	360	EA	$375	$135,000
2	Mark-up and installation			25.0%	$33,800
3	Radio Read Heads (on existing meters)	120	EA	$195	$23,400
4	Radio Read Metering System	1	LS	$35,000	$35,000
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$23,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			25.0%	$57,000
19	Bonding			2.5%	$6,000
20	Contractor overhead and profit			10.0%	$23,000
				SUBTOTAL	**$ 336,000**
				Contingency: 20%	$ 67,000
				Prevailing Wages & AIS: 7.5%	$ 30,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 81,000
				Legal and Administrative: 1%	$ 4,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 518,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: **DATE:** 9/1/2019

Bayview Water and Sewer District Water System Facility Plan

PROJECT DESCRIPTION:

Distribution - New Water Meters & Services - Meters and Services In Areas Covered by the LHD 2023 Road Repair Project and **Connected to Lines in Roads Being Repaired by LHD**

CLIENT:

Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	Water Meters - 3/4-inch	110	EA	$375	$41,250
2	Mark-up and installation			25.0%	$10,300
3	Water Service Connection to Mainline - Size: 3/4"	110	EA	$1,300	$143,000
4	Water Service Pipe - Size: 3/4" Type: C-901 Polyethylene (DR 7)	2,200	LF	$10	$22,000
5	Curb Stop and Box - Size 3/4"	110	EA	$300	$33,000
6	Meter Pit Installation and Plastic Box - Size: 3/4"	110	EA	$500	$55,000
7	Miscellaneous Surface Restoration (Natural Ground)	550	LF	$10	$5,500
8	Type “P” Surface Restoration (Asphalt Roadway)	1,650	LF	$25	$41,250
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$35,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$9,000
20	Contractor overhead and profit			10.0%	$35,000
				SUBTOTAL	**$ 430,000**
				Contingency: 20%	$ 86,000
				Prevailing Wages & AIS: 7.5%	$ 39,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 103,000
				Legal and Administrative: 1%	$ 6,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 664,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION:
Distribution - New Water Meters & Services - Meters and Services In Areas Covered by the 2023 LHD Road Repair Project and Connected to **Lines in Roads NOT Being Repaired by LHD**

CLIENT:
Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	Water Meters - 3/4-inch	97	EA	$375	$36,375
2	Mark-up and installation			25.0%	$9,100
3	Water Service Connection to Mainline - Size: 3/4"	97	EA	$1,300	$126,100
4	Water Service Pipe - Size: 3/4" Type: C-901 Polyethylene (DR 7)	1,940	LF	$10	$19,400
5	Curb Stop and Box - Size 3/4"	97	EA	$300	$29,100
6	Meter Pit Installation and Plastic Box - Size: 3/4"	97	EA	$500	$48,500
7	Miscellaneous Surface Restoration (Natural Ground)	485	LF	$10	$4,850
8	Type “P” Surface Restoration (Asphalt Roadway)	1,455	LF	$25	$36,375
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$31,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$8,000
20	Contractor overhead and profit			10.0%	$31,000
				SUBTOTAL	**$ 380,000**
				Contingency: 20%	$ 76,000
				Prevailing Wages & AIS: 7.5%	$ 34,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 91,000
				Legal and Administrative: 1%	$ 5,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 586,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION:
Distribution - New Water Meters & Services - Meters and Services In The District Outside the LHD Project Area and **Unaffected by the LHD 2023 Road Repair Project**

CLIENT:
Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	Water Meters - 3/4-inch	273	EA	$375	$102,375
2	Mark-up and installation			25.0%	$25,600
3	Water Service Connection to Mainline - Size: 3/4"	273	EA	$1,300	$354,900
4	Water Service Pipe - Size: 3/4" Type: C-901 Polyethylene (DR 7)	5,460	LF	$10	$54,600
5	Curb Stop and Box - Size 3/4"	273	EA	$300	$81,900
6	Meter Pit Installation and Plastic Box - Size: 3/4"	273	EA	$500	$136,500
7	Miscellaneous Surface Restoration (Natural Ground)	1,365	LF	$10	$13,650
8	Type “P” Surface Restoration (Asphalt Roadway)	4,095	LF	$25	$102,375
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$87,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$22,000
20	Contractor overhead and profit			10.0%	$87,000
				SUBTOTAL	**$ 1,068,000**
				Contingency: 20%	$ 214,000
				Prevailing Wages & AIS: 7.5%	$ 96,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 256,000
				Legal and Administrative: 1%	$ 14,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 1,648,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: **DATE:** 9/1/2019

Bayview Water and Sewer District Water System Facility Plan

PROJECT DESCRIPTION:

Transmission - New 10" line from well #7 to Farragut tank junction

CLIENT:

Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES QNTY	UNIT	UNIT PRICE	TOTAL COST
1	10" C-900 PVC Water Main	2,000	LF	$80	$160,000
2	Type “P” Surface Restoration (Asphalt Roadway)	200	LF	$25	$5,000
3	Miscellaneous Surface Restoration (Natural Ground)	1,800	LF	$5	$9,000
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$17,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$4,000
20	Contractor overhead and profit			10.0%	$17,000
				SUBTOTAL	**$ 212,000**
				Contingency: 20%	$ 42,000
				Prevailing Wages & AIS: 7.5%	$ 19,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 51,000
				Legal and Administrative: 1%	$ 3,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 327,000**

\\CDAFILES\Public\Projects\JUB\20-17-070 BWSD Facility Plan\Spreadsheets\Cost Opinions\BWSD_Distribution_Costs_Revised

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Transmission - 12" line from tank junction to Farragut Tank

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	12" C-900 PVC Water Main	2,000	LF	$85	$170,000
2	Type “P” Surface Restoration (Asphalt Roadway)	200	LF	$25	$5,000
3	Miscellaneous Surface Restoration (Natural Ground)	1,800	LF	$5	$9,000
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$18,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$5,000
20	Contractor overhead and profit			10.0%	$18,000

SUBTOTAL	**$**	**225,000**
Contingency: 20%	$	45,000
Prevailing Wages & AIS: 7.5%	$	20,000
State Sales Tax: N/A		-
Design / CMS: 20%	$	54,000
Legal and Administrative: 1%	$	3,000
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**347,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Transmission - new line from Tank Junction to Distribution System

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES QNTY	UNIT	UNIT PRICE	TOTAL COST
1	12" C-900 PVC Water Main	1,250	LF	$85	$106,250
2	Miscellaneous Surface Restoration (Natural Ground)	1,250	LF	$5	$6,250
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$11,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$3,000
20	Contractor overhead and profit			10.0%	$11,000
				SUBTOTAL	**$ 138,000**
				Contingency: 20%	$ 28,000
				Prevailing Wages & AIS: 7.5%	$ 12,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 33,000
				Legal and Administrative: 1%	$ 2,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 213,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water System

DATE: 9/1/2019

PROJECT DESCRIPTION: Transmission - new line from Tank Junction to Distribution System

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	General Maintenance		**Present Worth**	
	Capital Cost	$106,250		
	Maintenance / yr	0.0%		
	Increased use / yr	0.0%		Discount Rate
				1.500%
Year		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$0	$0	$0
2		$0	$0	$0
3		$0	$0	$0
4		$0	$0	$0
5		$0	$0	$0
6		$0	$0	$0
7		$0	$0	$0
8		$0	$0	$0
9		$0	$0	$0
10		$0	$0	$0
11		$0	$0	$0
12		$0	$0	$0
13		$0	$0	$0
14		$0	$0	$0
15		$0	$0	$0
16		$0	$0	$0
17		$0	$0	$0
18		$0	$0	$0
19		$0	$0	$0
20		$0	$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ -**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: **DATE:** 9/1/2019

Bayview Water and Sewer District Water System Facility Plan

PROJECT DESCRIPTION:

Distribution - New Distribution Main along west side of District

CLIENT:

Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	12" C-900 PVC Water Main	5,400	LF	$85	$459,000
2	Type "P" Surface Restoration (Asphalt Roadway)	1,350	LF	$25	$33,750
3	Miscellaneous Surface Restoration (Natural Ground)	4,050	LF	$5	$20,250
4	New PRVs in New Vaults	2	LS	$40,000	$80,000
5	New PRVs (In Existing Vaults)	2	EA	$8,000	$16,000
6	Mark-up and installation			25.0%	$4,000
7	Fire Hydrant Assembly	11	EA	$4,500	$49,500
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$66,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$17,000
20	Contractor overhead and profit			10.0%	$66,000
				SUBTOTAL	**$ 812,000**
				Contingency: 20%	$ 162,000
				Prevailing Wages & AIS: 7.5%	$ 73,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 195,000
				Legal and Administrative: 1%	$ 10,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 1,252,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water System

DATE: 9/1/2019

PROJECT DESCRIPTION: Distribution - New Distribution Main along west side of District

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

Year	General Maintenance		Present Worth	
	Capital Cost	$539,000		
	Maintenance / yr	0.1%		
	Increased use / yr	0.0%		Discount Rate 1.500%
		Cost in Year *i*	**Total by Year**	**Present Worth**
1		$539	$539	$539
2		$539	$539	$531
3		$539	$539	$523
4		$539	$539	$515
5		$539	$539	$508
6		$539	$539	$500
7		$539	$539	$493
8		$539	$539	$486
9		$539	$539	$478
10		$539	$539	$471
11		$539	$539	$464
12		$539	$539	$458
13		$539	$539	$451
14		$539	$539	$444
15		$539	$539	$438
16		$539	$539	$431
17		$539	$539	$425
18		$539	$539	$418
19		$539	$539	$412
20		$539	$539	$406
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ 9,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Distribution - New Distribution Main - Additional length to Dromore Area

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	6" C-900 PVC Water Main	800	LF	$70	$56,000
	Type “P” Surface Restoration (Asphalt Roadway)	800	LF	$25	$20,000
2	New PRVs in New Vaults	1	LS	$40,000	$40,000
3	New PRVs (In Existing Vaults)	2	EA	$8,000	$16,000
4	Mark-up and installation			25.0%	$4,000
5	Fire Hydrant Assembly	2	EA	$4,500	$9,000
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$15,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$4,000
20	Contractor overhead and profit			10.0%	$15,000

SUBTOTAL	**$**	**179,000**
Contingency: 20%	$	36,000
Prevailing Wages & AIS: 7.5%	$	16,000
State Sales Tax: N/A		-
Design / CMS: 20%	$	43,000
Legal and Administrative: 1%	$	2,000
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**276,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water System

DATE: 9/1/2019

PROJECT DESCRIPTION: Distribution - New Distribution Main - Additional length to Dromore Area

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

Year	General Maintenance		Present Worth	
	Capital Cost	$96,000		
	Maintenance / yr	0.0%		
	Increased use / yr	0.0%		Discount Rate
				1.500%
		Cost in Year *i*	**Total by Year**	**Present Worth**
1		$0	$0	$0
2		$0	$0	$0
3		$0	$0	$0
4		$0	$0	$0
5		$0	$0	$0
6		$0	$0	$0
7		$0	$0	$0
8		$0	$0	$0
9		$0	$0	$0
10		$0	$0	$0
11		$0	$0	$0
12		$0	$0	$0
13		$0	$0	$0
14		$0	$0	$0
15		$0	$0	$0
16		$0	$0	$0
17		$0	$0	$0
18		$0	$0	$0
19		$0	$0	$0
20		$0	$0	$0
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ -**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Distribution - Upsize All 2-Inch Diameter Lines to Minimum 6-Inch Diameter

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES QNTY	UNIT	UNIT PRICE	TOTAL COST
1	6" C-900 PVC Water Main	5,100	LF	$70	$357,000
2	Type “P” Surface Restoration (Asphalt Roadway)	3,060	LF	$25	$76,500
3	Miscellaneous Surface Restoration (Natural Ground)	2,040	LF	$5	$10,200
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$44,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$11,000
20	Contractor overhead and profit			10.0%	$44,000
				SUBTOTAL	**$ 543,000**
				Contingency: 20%	$ 109,000
				Prevailing Wages & AIS: 7.5%	$ 49,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 130,000
				Legal and Administrative: 1%	$ 7,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 838,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Distribution - Upsize All 4-Inch Diameter Lines to Minimum 6-Inch Diameter

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	6" C-900 PVC Water Main	16,100	LF	$70	$1,127,000
2	Type "P" Surface Restoration (Asphalt Roadway)	9,660	LF	$25	$241,500
3	Miscellaneous Surface Restoration (Natural Ground)	6,440	LF	$5	$32,200
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$140,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$35,000
20	Contractor overhead and profit			10.0%	$140,000

SUBTOTAL	**$**	**1,716,000**
Contingency: 20%	$	343,000
Prevailing Wages & AIS: 7.5%	$	154,000
State Sales Tax: N/A		-
Design / CMS: 20%	$	412,000
Legal and Administrative: 1%	$	22,000
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**2,647,000**

\\CDAFILES\Public\Projects\JUB\20-17-070 BWSD Facility Plan\Spreadsheets\Cost Opinions\BWSD_Distribution_Costs_Revised

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Distribution - Upsize All 5-Inch Diameter Steel Lines to Minimum 6-Inch Diameter

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	6" C-900 PVC Water Main	4,200	LF	$70	$294,000
2	Type "P" Surface Restoration (Asphalt Roadway)	3,360	LF	$25	$84,000
3	Miscellaneous Surface Restoration (Natural Ground)	840	LF	$5	$4,200
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$38,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			0.0%	$0
19	Bonding			2.5%	$10,000
20	Contractor overhead and profit			10.0%	$38,000
				SUBTOTAL	**$ 468,000**
				Contingency: 20%	$ 94,000
				Prevailing Wages & AIS: 7.5%	$ 42,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 112,000
				Legal and Administrative: 1%	$ 6,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 722,000**

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Appendix 3-C

Opinions of Probable Cost – Supply

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Project: Bayview Water and Sewer District Water System Facility Plan
Client: Bayview Water and Sewer District
System: Supply

Link to Detailed Sheet	Option	Description	Capital Cost	O&M Cost (20-Yr Present Worth)	Total Present Worth Cost
General Improvements	General Improvements	SCADA Upgrades	$32,000	--	$32,000
Well #7 Upgrades	Well #7 Upgrades	General Upgrades to Well #7	$123,000	--	$123,000
Well #8 Upgrades	Well #8 Upgrades	General Upgrades to Well #8	$99,000	--	$99,000
Well #8 Generator	Well #8 Generator	New 100kW generator and automatic transfer switch for Well #8.	$130,000	$8,000	$138,000

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan — **DATE:** 9/1/2019

PROJECT DESCRIPTION: Supply - General Improvements

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	SCADA upgrades	1	LS	$10,000	$10,000
2	Convert Water Right to Municipal	1	LS	$3,000	$3,000
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$1,300
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			25.0%	$3,000
19	Bonding			2.5%	$300
20	Contractor overhead and profit			10.0%	$1,000

SUBTOTAL	**$**	**19,000**
Contingency: 30%	$	6,000
Prevailing Wages & AIS: 7.5%	$	2,000
State Sales Tax: N/A		-
Design / CMS: 20%	$	5,000
Legal and Administrative: 1%	$	-
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**32,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Supply - Well #7 Upgrades

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	Pump Control Valve and Piping	1	LS	$20,000	$20,000
2	Pipe Coating	1	LS	$5,000	$5,000
3	Automatic Transfer Switch	1	LS	$10,000	$10,000
4	Pump to Waste Dry Well	1	LS	$15,000	$15,000
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$5,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			25.0%	$13,000
19	Bonding			2.5%	$1,000
20	Contractor overhead and profit			10.0%	$5,000

SUBTOTAL	**$**	**74,000**
Contingency: 30%	$	22,000
Prevailing Wages & AIS: 7.5%	$	7,000
State Sales Tax: N/A		-
Design / CMS: 20%	$	19,000
Legal and Administrative: 1%	$	1,000
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**123,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water System | **DATE:** 9/1/2019

PROJECT DESCRIPTION: Supply - Well #7 Upgrades

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

Year	General Maintenance		Present Worth	
	Capital Cost	$35,000		
	Maintenance / yr	1.0%		
	Increased use / yr	0.0%		Discount Rate
				1.500%
		Cost in Year *i*	**Total by Year**	**Present Worth**
1		$350	$350	$350
2		$350	$350	$345
3		$350	$350	$340
4		$350	$350	$335
5		$350	$350	$330
6		$350	$350	$325
7		$350	$350	$320
8		$350	$350	$315
9		$350	$350	$311
10		$350	$350	$306
11		$350	$350	$302
12		$350	$350	$297
13		$350	$350	$293
14		$350	$350	$288
15		$350	$350	$284
16		$350	$350	$280
17		$350	$350	$276
18		$350	$350	$272
19		$350	$350	$268
20		$350	$350	$264
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ 6,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Supply - Well #8 upgrades

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES			
		QNTY	UNIT	UNIT PRICE	TOTAL COST
1	Pump Control Valve and Piping	1	LS	$20,000	$20,000
2	Pipe Coating	1	LS	$5,000	$5,000
3	Pump to Waste Dry Well	1	LS	$15,000	$15,000
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$4,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			25.0%	$10,000
19	Bonding			2.5%	$1,000
20	Contractor overhead and profit			10.0%	$4,000

SUBTOTAL	**$**	**59,000**
Contingency: 30%	$	18,000
Prevailing Wages & AIS: 7.5%	$	6,000
State Sales Tax: N/A		-
Design / CMS: 20%	$	15,000
Legal and Administrative: 1%	$	1,000
TOTAL PROBABLE COST (2019 DOLLARS)	**$**	**99,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water System

DATE: 9/1/2019

PROJECT DESCRIPTION: Supply - Well #8 upgrades

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	General Maintenance		Present Worth	
	Capital Cost	$40,000		
	Maintenance / yr	1.0%		
	Increased use / yr	0.0%		Discount Rate
				1.500%
Year		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$400	$400	$400
2		$400	$400	$394
3		$400	$400	$388
4		$400	$400	$383
5		$400	$400	$377
6		$400	$400	$371
7		$400	$400	$366
8		$400	$400	$360
9		$400	$400	$355
10		$400	$400	$350
11		$400	$400	$345
12		$400	$400	$340
13		$400	$400	$335
14		$400	$400	$330
15		$400	$400	$325
16		$400	$400	$320
17		$400	$400	$315
18		$400	$400	$311
19		$400	$400	$306
20		$400	$400	$301
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ 7,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan

DATE: 9/1/2019

PROJECT DESCRIPTION: Supply - Well #8 Generator and Automatic Transfer Switch

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	QNTY	UNIT	UNIT PRICE	TOTAL COST
1	100 kW Generator	1	LS	$35,000	$35,000
2	Mark-up and installation			25.0%	$8,800
3	Automatic Transfer Switch	1	LS	$10,000	$10,000
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$5,000
16	Yard Piping			0.0%	$0
17	Site Civil			0.0%	$0
18	Electrical and instrumentation			25.0%	$13,000
19	Bonding			2.5%	$1,000
20	Contractor overhead and profit			10.0%	$5,000
				SUBTOTAL	**$ 78,000**
				Contingency: 30%	$ 23,000
				Prevailing Wages & AIS: 7.5%	$ 8,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 20,000
				Legal and Administrative: 1%	$ 1,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 130,000**

ENGINEER'S OPINION OF PROBABLE COST - Operation and Maintenance

PROJECT: Bayview Water and Sewer District Water System

DATE: 9/1/2019

PROJECT DESCRIPTION: Supply - Well #8 Generator and Automatic Transfer Switch

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

	General Maintenance		Present Worth	
	Capital Cost	$45,000		
	Maintenance / yr	1.0%		
	Increased use / yr	0.0%		Discount Rate 1.500%
Year		**Cost in Year *i***	**Total by Year**	**Present Worth**
1		$450	$450	$450
2		$450	$450	$443
3		$450	$450	$437
4		$450	$450	$430
5		$450	$450	$424
6		$450	$450	$418
7		$450	$450	$412
8		$450	$450	$405
9		$450	$450	$399
10		$450	$450	$394
11		$450	$450	$388
12		$450	$450	$382
13		$450	$450	$376
14		$450	$450	$371
15		$450	$450	$365
16		$450	$450	$360
17		$450	$450	$355
18		$450	$450	$349
19		$450	$450	$344
20		$450	$450	$339
NET PRESENT WORTH - TOTAL O&M (2019 DOLLARS)				**$ 8,000**

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Bayview Water and Sewer District Water System Facility Plan
DATE: 9/1/2019

PROJECT DESCRIPTION: Supply - New Production Well

CLIENT: Bayview Water and Sewer District

CLIENT PROJ. NO.

ITEM NO.	DESCRIPTION	SCHEDULE OF VALUES QNTY	UNIT	UNIT PRICE	TOTAL COST
1	Test Production Well				
2	Drill and EvaluateTest Production Well	200	LF	$250	$50,000
3	New Production Well				
4	Drill New 12" Diameter Well and Install Casing	200	LF	$200	$40,000
5	Well Screen - 12" Telescoping	50	LF	$285	$14,250
6	Disinfection and Water Quality Testing	1	LS	$10,000	$10,000
7	Test Pump and Production Testing	1	LS	$10,000	$10,000
8	Video Inspection	1	LS	$5,000	$5,000
9	New Well House				
10	Well House Building	500	SF	$300	$150,000
11	Submersible Turbine Pump/Motor (750 gpm w/ VFD)	1	LS	$100,000	$100,000
12	Valves and Appurtenances	1	LS	$20,000	$20,000
13	Mechanical Piping in Well House	1	LS	$20,000	$20,000
14	Start-Up and Commissioning	1	LS	$20,000	$20,000
15	100 kW Generator	1	LS	$35,000	$35,000
16	Mark-up and installation			25%	$8,800
17	Automatic Transfer Switch	1	LS	$10,000	$10,000
18					
19					
20					
21					
22					
23					
24	Additional Elements (estimated % of above)				
25	Contractor mobilization and administration			10.0%	$49,000
26	Yard Piping			2.5%	$12,000
27	Site Civil			2.5%	$12,000
28	Electrical and instrumentation			25.0%	$123,000
29	Bonding			2.5%	$12,000
30	Contractor overhead and profit			10.0%	$49,000
				SUBTOTAL	**$ 750,000**
				Contingency: 30%	$ 225,000
				Prevailing Wages & AIS: 7.5%	$ 73,000
				State Sales Tax: N/A	-
				Design / CMS: 20%	$ 195,000
				Legal and Administrative: 1%	$ 10,000
				TOTAL PROBABLE COST (2019 DOLLARS)	**$ 1,253,000**

THIS PAGE WAS INTENTIONALLY LEFT BLANK

TECHNICAL MEMORANDUM No. 4

J-U-B ENGINEERS, INC.

Bayview Water and Sewer District
Water System Facility Plan

System Alternatives and Implementation

PROFESSIONAL ENGINEER
REGISTERED
7768
6.26.20
STATE OF IDAHO
STEPHEN P. JAMES

June 2020

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Contents

Tables

Figures

Appendices

TM No. 4 – System Alternatives

4.1 Introduction of Alternatives

Based on the known system deficiencies and the input from the public process identified above, the following alternatives were identified for consideration for the District's potable water system.

- Project A: New Storage, New Transmission, and New Distribution.
- Project B: Rehabilitate Existing Storage, Replace Existing Transmission, and New Dromore Storage
- Project C: Rehabilitate Existing Storage and Replace Existing Transmission
- Project D: No Action
- Project E: Rehabilitate Existing Storage, New Transmission, and New Distribution
    - This Project was added to the Facility Plan after the original technical review submittal to IDEQ based on input from District rate payers.
- Meter Replacement Project
- Meter service line and pipe upsizing projects

Each of these alternatives is presented in the following sections with potential advantages, disadvantages, and environmental impacts. **Table 4-1** presents a summary of immediate probable capital costs for system improvement options developed in Technical Memorandum No. 3. Rate increases are shown for two potential design and construction funding sources, the State Revolving Loan (SRF) program through IDEQ and U.S. Department of Agriculture Rural Development's (USDA RD) construction loan program. A detailed list of the improvement options and alternatives, including probable costs, are summarized in **Table 4-2**, and a list of the key factors related to the improvement options and alternatives is summarized in

Since some of these alternatives do not address all system deficiencies, future phasing of additional improvements is presented for each alternate in **Table 4-3**.

Costs presented in subsequent sections are in 2019 dollars with capital costs assuming 10 percent to 30 percent contingency. Project design and construction management (i.e., engineering-related costs) are included. Costs also include prevailing wages (i.e., Davis-Bacon Wages) and American Iron and Steel (AIS) requirements, as these items may impact final costs depending on the District's funding source for the selected improvements. Operations and maintenance (O&M) costs presented are incremental costs above existing O&M expenses and do not include depreciation funding.

It is also noted that:

- Replacement of the "torpedo" surge control in the existing well house has been added to all alternatives as a result of the April 2019 Sanitary Survey.
- All options including tank rehabilitation assume crack repair, interior/exterior coating, replacement of the existing piping, and safety improvements.

Table 4-1 – Probable Capital Cost and Monthly Rate Increase of Each Alternative

Estimated Cost	Project A (New Storage, New Transmission, and New Distribution)	Project B (Rehabilitate Existing Storage, Replace Existing Transmission, and New Dromore Storage)	Project C (Rehabilitate Existing Storage and Replace Existing Transmission)	Project D (No Action)	Project E (Rehabilitate Existing Storage, New Transmission, and New Distribution)
Capital Cost [a]	$3,462,000	$1,842,000	$1,597,000	$0	$3,317,000
Monthly Rate Increase per Connection – IDEQ Funding [b]	$26.20	$13.94	$12.08	$8.00 [d]	$25.10
Monthly Rate Increase per Connection – USDA RD Funding [c]	$28.44	$15.13	$13.12	$8.00 [d]	$27.32

(a) Estimated cost in 2019 dollars. Capital costs assume +20 percent contingency. Includes project design, construction management, prevailing wages, and American Iron and Steel requirements.

(b) Costs shown are increases to existing water rates to complete the listed improvements. The District may choose to pursue fewer improvements if that better fits its financial and system priorities. The total monthly cost per connection can be determined by adding the costs shown in the table to the District's existing monthly water rate. Cost increases are based on 475 current connections reported by the District and assume an interest rate of 1.75% and a payback period of 30 years as indicated by the previous IDEQ loan offer.

(c) Costs shown are increases to existing water rates to complete the listed improvements. The District may choose to pursue fewer improvements if that better fits its financial and system priorities. The total monthly cost per connection can be determined by adding the costs shown in the table to the District's existing monthly water rate. Cost increases are based on 475 current connections reported by the District and assume an interest rate of 3.5% and a payback period of 40 years as indicated by preliminary discussions with USDA Rural Development.

(d) This rate was estimated based on establishing a replacement fund for emergency repair of approximately $228,000 in 5 years (amount based on approximately 10% of existing audited system asset value).

Table 4-2 – Summary of Improvements for Each Alternative

Item	Description	Capital Cost (a)	Project A (New Storage, New Transmission, and New Distribution)	Project B (Rehabilitate Existing Storage, Replace Existing Transmission, and New Dromore Storage)	Project C (Rehabilitate Existing Storage and Replace Existing Transmission)	Project D (No Action)	Project E (Rehabilitate Existing Storage, New Transmission, and New Distribution)
Supply							
General Improvements	• Upgrade the existing control system (SCADA) at the well sites for more reliable control. • Aggregate water rights and all water supply diversion points with a municipal designation.	$32,000	✓	✓	✓		✓
Well #7 Upgrades	• New automatic transfer switch for the existing generator. • Replace the torpedo casings with pump control valves, including pump-to-waste function. • Pipe coatings and repairs	$125,000	✓	✓	✓		✓
Well #8 Upgrades	• Replace the torpedo casings with pump control valves, including pump-to-waste function. • Pipe coatings and repairs.	$100,000	✓	✓	✓		✓
Well #8 Generator	• New generator and automatic switch for Well #8	$130,000			✓		✓
Storage							
General Improvements	• Upgrade existing control system (SCADA) to include reliability during power outages, provide more data to the District office, and remote access to the system operator.	$25,000	✓	✓	✓		✓
New Main Storage Tank	• Construct a new +/- 305,000-gallon water storage tank to replace the existing Farragut Tank (Reservoir #1).	$1,300,000	✓				
New Dromore Storage Tank	• Replace the Dromore Tank with a larger, 65,000-gallon tank	$375,000		✓			
Rehabilitate Existing Farragut Tank	• Rehabilitate the existing Farragut Tank with epoxy crack sealing, an epoxy interior coating, and acrylate exterior coatings • Address OSHA concerns (stairs, access ladder, etc.)	$750,000		✓	✓		✓
Distribution							
General Improvements	• Rebuild the existing PRVs for improved system operation. • Add pressure relief valves to booster station discharges	$85,000	✓	✓	✓		✓
New Transmission Main (Well #7 to Bayview)	• Construct a new 12-inch transmission main to the District's distribution network. (Well #7 to Farragut tank junction to distribution system).	$545,000	✓				✓
New Distribution Main (south of Bayview to north of Bayview)	• Construct a new 12-inch distribution main along the west side of the District's existing system to connect with the new storage tank.	$1,250,000	✓				✓
Distribution Extension to Dromore	• Extend the new distribution main to the Dromore area.	$275,000					✓
Replace Existing Transmission Main	• Replace existing aging transmission lines from Farragut tank to tank junction.	$350,000		✓	✓		
		Total Project Cost (Capital 2019 Dollars):	$3,462,000	$1,842,000	$1,597,000	$0	$3,317,000

Table 4-3 – Additional Projects

Item	Description	Capital Cost [a]
Other Improvements		
Water Meter Replacement (Meters only)	• Replace 360 meters • Replace 120 meter-heads	$520,000
Water Meters and Services Replacement	• Replace water meters & service lines in the LHD 2023 project area. • Replace only meters/services connected to water main in roads scheduled for replacement by LHD. • Total Meters/Services ~110	$670,000
Water Meters and Services Replacement	• Replace water meters/ service lines in the LHD 2023 project area. • Replace only meters/services connected to water main in roads not scheduled for replacement by LHD. • Total Meters/Services ~97	$590,000
Water Meters and Services Replacement	• Replace water meters and services in the rest of the Water District outside the LHD Project Area. • Total Meters/Services ~318	$1,650,000
Upsize Undersized Pipelines	• Upsize all Existing 2” Diameter Lines to 6” Diameter.	$910,000
Upsize Undersized Pipelines	• Upsize all Existing 4” Diameter Lines to 6” Diameter.	$2,870,000
Upsize Undersized Pipelines	• Upsize all existing 5” Diameter lines to 6” Diameter.	$780,000

Table 4-4 - Summary of Key Factors with Each Alternative

ALTERNATIVES	KEY FACTORS				
	Estimated Monthly Cost to Customers	Expected Life	Increase System Storage and Fire Flow	Improved System Pressures/Flow to Customers	Will there be significant future needs?
Project A (New tank, New piping)	$28.44	75-100	xx	xx	
Project B (Rehab Farragut Res, New Dromore Res)	$15.13	25-30	x	x	x
Project C (Minimum Project)	$13.12	25-30			xx
“No Action” Project	$8.00				xx
Project E (Rehab Farragut res, New piping)	$27.32	25-50	xx	xx	x

4.1.1 Project A – New Storage, New Transmission, and New Distribution

This alternative addresses the District's main issues related to an aging storage facility and transmission mains that contribute to the large amount of non-revenue water. This project involves the components listed below. Advantages and disadvantages for this project are presented in **Table 4-5** and a sketch of the proposed improvements is shown in **Figure 4-1**.

- Supply
    - General Improvements
        - Upgrade the existing control system (SCADA) for more reliable control.
        - Aggregate water rights and all water supply diversion points with a municipal designation.
    - Well #7 Upgrades
        - Replace the existing automatic transfer switch for the existing generator.
        - Replace the torpedo casings with pump control valves.
        - Recoat pump discharge piping
    - Well #8 Upgrades
        - Replace the torpedo casings with pump control valves.
        - Recoat pump discharge piping
- Storage
    - General Improvements
        - Upgrade existing control system (SCADA) to include reliability during power outages, provide more data to the District office, and remote access to the system operator.
    - Construct a new 305,000-gallon water storage tank to replace the existing Farragut Tank (Reservoir #1).
- Distribution
    - General Improvements
        - Rebuild/tune the existing PRVs for improved system operation.
    - Construct a new 12-inch transmission main to the District's distribution network.
    - Construct a new 12-inch distribution main along the west side of the District's existing system to connect with the new storage tank.
    - Construct a new 6" main to connect the new tank to the Dromore system.

Figure 4-1 – Project A Overview

Table 4-5 - Project A – Advantages and Disadvantages

Component	Advantages	Disadvantages
Supply	Improved general operations. Added control and reliability to supply system. Addresses deficiencies noted on the District's 2019 Sanitary Survey.	Increased water rates to fund improvements. Retains existing water supply infrastructure.
Storage	Improved general operations. Finished water storage adequate to meet future storage requirements plus desired fire suppression storage goals in Bayview Area. Consolidates storage needs and eliminates the Dromore tank and booster.	Increased water rates to fund improvements. Property needed for tank construction.
Distribution	Improved general operations. Anticipated decrease in non-revenue water due to improved transmission/distribution piping. Increased pressure and fire flow capabilities of the transmission/distribution system due to larger diameter mains.	Dead-end, small diameter lines still exist throughout the District. Increased water rates to fund improvements.

4.1.2 Project B – Rehabilitate Existing Storage, Replace Existing Transmission, and New Dromore Storage

This alternative addresses the District's main issues related to inadequate storage volume and pressures in the Dromore area and aging transmission mains that contribute to the large amount of non-revenue water. This project involves the components listed below. Advantages and disadvantages for this project are presented in

Table 4-6 and a sketch of the proposed improvements is shown in **Figure 4-2.**

- Supply
  - General Improvements
    - Upgrade the existing control system (SCADA) for more reliable control.
    - Aggregate water rights and all water supply diversion points with a municipal designation.
  - Well #7 Upgrades
    - Replace the existing automatic transfer switch for the existing generator.
    - Replace the torpedo casings with pump control valves.
    - Recoat pump discharge piping.
  - Well #8 Upgrades
    - Provide back-up power (generator) and an automatic transfer switch to reduce required storage volume.
    - Replace the torpedo casings with pump control valves.
    - Recoat pump discharge piping.
    - New generator and automatic transfer switch.
- Storage
  - General Improvements
    - Upgrade existing control system (SCADA) to include reliability during power outages, provide more data to the District office, and remote access to the system operator.
  - Rehabilitate the existing Farragut Tank (Reservoir #1) with epoxy crack sealing, an epoxy interior coating, and acrylate exterior coating. Replace tank access stairs and overflow/discharge piping.
  - Replace the Dromore Tank with a larger, 65,000-gallon Tank and replace one booster pump.
- Distribution
  - General Improvements
    - Rebuild/tune the existing PRVs for improved system operation.
  - Replace existing aging transmission lines in the Farragut area.

Figure 4-2 – Project B Overview

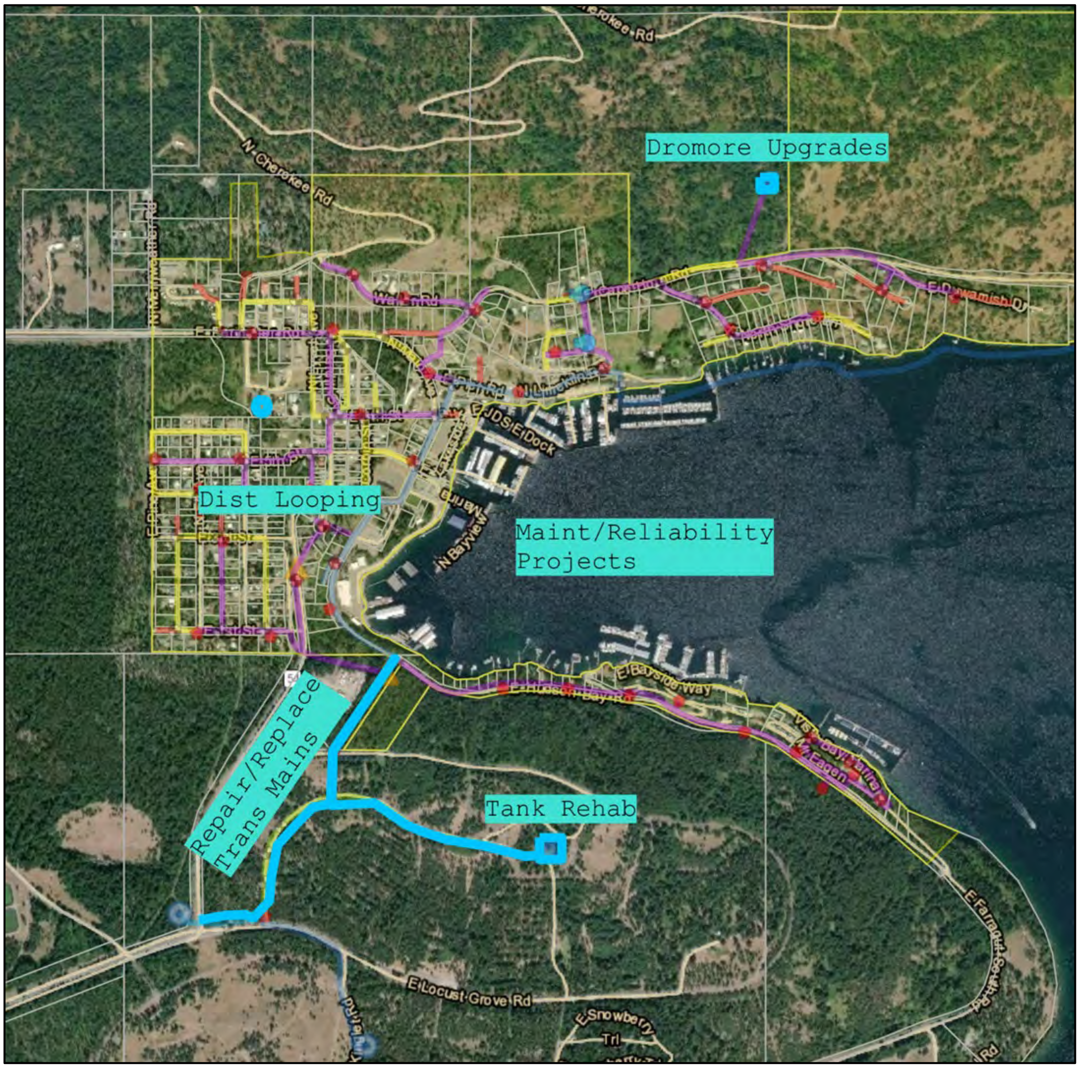


Table 4-6 – Project B - Advantages and Disadvantages

Component	Advantages	Disadvantages
Supply	Improved general operations. Added control and reliability to supply system. Addresses deficiencies noted on the District's 2019 Sanitary Survey. Standby generator on Well #8 reduces required storage volume.	Increased water rates to fund improvements.
Storage	Improved general operations. Increase available pressures and available fire flow in the Dromore area to meet desired fire suppression storage goals. Rehabilitation of the existing Farragut Tank would address existing leakage and repair cracks in the main tank, allowing continued use.	Existing Farragut Tank will be approximately 95 years old at the end of the planning period (2037). Rehabilitation of the Farragut Tank does not address the fact that the existing structure was not designed to current standards and building codes for earthquake resistance. Lease of storage tank must be extended as current lease ends in 2027. Increased water rates to fund improvements.
Distribution	Improved general operations. Anticipate decrease in non-revenue water due to improved transmission/distribution piping.	Dead-end, small diameter lines still exist throughout the District. Areas of low pressure would remain, and fire flows would still be limited. Increased water rates to fund improvements. Remaining transmission mains are suspected to continue leaking.

4.1.3 Project C – Rehabilitate Existing Storage and Replace Existing Transmission

This project alternative is limited to addressing the continued deterioration of the existing main reservoir and the aging transmission mains that contribute to the large amount of non-revenue water. This project involves the components listed below. Advantages and disadvantages for this project are presented in **Table 4-7** and a sketch of the proposed improvements is shown in **Figure 4-3**.

- Supply
  - General Improvements
    - Upgrade the existing control system (SCADA) for more reliable control.
    - Aggregate water rights and all water supply diversion points with a municipal designation.
  - Well #7 Upgrades
    - Replace the existing automatic transfer switch for the existing generator.
    - Replace the torpedo casings with pump control valves.
    - Recoat pump discharge piping.
  - Well #8 Upgrades

        - Replace the torpedo casings with pump control valves.
        - Recoat pump discharge piping.
- Storage
    - General Improvements
        - Upgrade existing control system (SCADA) to include reliability during power outages, provide more data to the District office, and remote access to the system operator.
    - Rehabilitate the existing Farragut Tank (Reservoir #1) with epoxy crack sealing, an epoxy interior coating, and acrylate exterior coating. Replace tank access stairs and overflow/discharge piping.
- Distribution
    - General Improvements
        - Upgrade existing control system (SCADA) to include reliability during power outages, provide more data to the District office, and remote access to the system operator.
    - Replace existing aging transmission lines in the Farragut area.

Figure 4-3 – Project C Overview

Table 4-7 - Project C – Advantages and Disadvantages

Component	Advantages	Disadvantages
Supply	Improved general operations. Added control and reliability to supply system. Addresses deficiencies noted on the District's 2019 Sanitary Survey.	Increased water rates to fund improvements.
Storage	Improved control operations. Rehabilitation of the existing Farragut Tank would address existing leakage and repair cracks in the main tank, allowing continued use.	Existing main Farragut Tank will be close to 95 years old at the end of the planning period (2037). Rehabilitation of the Farragut Tank does not address the fact that the existing structure was not designed to current standards and building codes for earthquake resistance. Lease of storage tank must be extended as current lease ends in 2027. Increased water rates to fund improvements. Dromore area would continue to lack fire protection.
Distribution	Improved general operations. Anticipated decrease in non-revenue water due to improved transmission/distribution piping.	Dead-end, small diameter lines still exist throughout the District. Increased water rates to fund improvements. Areas of low pressure would remain and fire flows would still be limited. Remaining transmission mains are suspected to continue leaking.

4.1.4 Project D – "No Action"

This alternative includes no capital expenditure for any basic needs of the District's potable water system through the planning period (2037). As a result, the system would likely experience decreased water quality, and operation and maintenance costs will increase as components continue aging and degrading. This alternative is not recommended for the following reasons:

- Supply
  - Performance will decrease as components age and required maintenance will increase.
  - Without automatic standby power, the production from the wells will remain susceptible to power outages.
- Storage
  - The control system will continue to be unreliable during power outages and will increase the risk of leaving the system with inadequate storage during an emergency.
  - The main storage tank will be about 100 years old, the condition will continue to deteriorate, and will be susceptible to catastrophic structural failure.

- Water storage is not adequate to meet desired future storage requirements plus desired fire suppression storage goals.
  - Performance will decrease as components age and required maintenance will increase.
- Distribution
  - The system will continue to experience a large amount of water that is unaccounted for through the meters and leaking transmission lines. This non-revenue water will most likely increase due to continued system aging.
  - Pressures and flow will continue to be reduced with future increasing demand.
  - Available fire flow will continue to be reduced with system aging and increasing system demand.
  - Performance will decrease as components age and required maintenance will increase.

4.1.5 Project E – Rehabilitate Existing Storage, New Transmission, and New Distribution

This alternative addresses the District's main issues related to inadequate storage volume, pressures in the Dromore area, and aging transmission mains that contribute to the large amount of non-revenue water. This project involves the components listed below. Advantages and disadvantages for this project are presented in **Table 4-8** and a sketch of the proposed improvements is shown in Error! Reference source not found..

- Supply
  - General Improvements
    - Upgrade the existing control system (SCADA) for more reliable control.
    - Aggregate water rights and all water supply diversion points with a municipal designation.
  - Well #7 Upgrades
    - Replace the existing automatic transfer switch for the existing generator.
    - Replace the torpedo casings with pump control valves.
    - Recoat pump discharge piping.
  - Well #8 Upgrades
    - Provide back-up power (generator) and an automatic transfer switch.
    - Replace the torpedo casings with pump control valves.
    - Recoat pump discharge piping.
- Storage
  - General Improvements
    - Upgrade existing control system (SCADA) to include reliability during power outages, provide more data to the District office, and remote access to the system operator.

- Rehabilitate the existing Farragut Tank (Reservoir #1) with epoxy crack sealing, an epoxy interior coating, and acrylate exterior coating. Replace tank access stairs and overflow discharge pipe.
- Distribution
  - General Improvements
    - Rebuild/tune the existing PRVs for improved system operation.
  - Construct a new 12-inch transmission main to the District's distribution network from Well #7. Note that the pipeline from this transmission main to the existing tank is not included to reduce project cost and because it is assumed that a new tank will be built in the future, potentially at a different location.
  - Construct a new 12-inch distribution main along the west side of the District's existing system. New PRV stations will be added as needed.
  - Replace 2" and 4" pipes to Dromore.

Figure 4-4 - Project E Overview

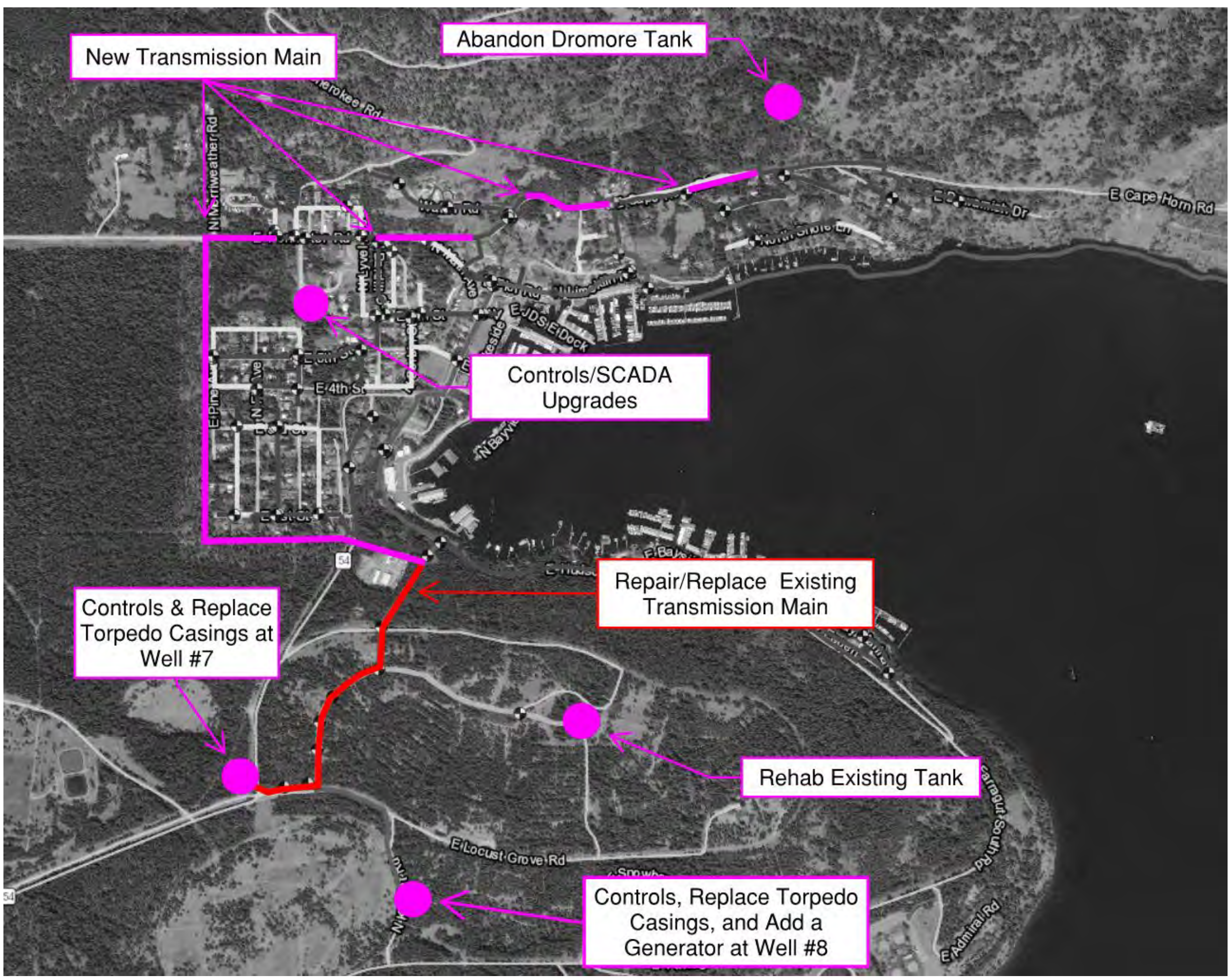


Table 4-8 - Project E – Advantages and Disadvantages

Component	Advantages	Disadvantages
Supply	Improved general operations. Added control and reliability to supply system. Addresses deficiencies noted on the District's 2019 Sanitary Survey. Standby generator on Well #8 reduces required storage volume.	Increased water rates to fund improvements.
Storage	Improved general operations. Rehabilitation of the existing Farragut Tank would address existing leakage and repair cracks in the main tank, allowing continued use.	Existing Farragut Tank will be approximately 95 years old at the end of the planning period (2037). Rehabilitation of the Farragut Tank does not address the fact that the existing structure was not designed to current standards and building codes for earthquake resistance. Lease of storage tank must be extended as current lease ends in 2027. Increased water rates to fund improvements.
Distribution	Improved general operations. Increased pressure and fire flow in the Dromore area. Anticipate decrease in non-revenue water due to improved transmission/distribution piping.	Dead-end, small diameter lines still exist throughout the District. Increased water rates to fund improvements.

4.1.6 Meter Replacement Project

The District indicated approximately 360 existing meters need to be replaced with new radio-read meters. An additional 120 existing meters require installation of radio-read meter heads. This work is not included in any of the main project alternatives discussed in previous sections based on District input. Due to the large amount of non-revenue water experienced by the District, accurate metering for all of the connections should be a high priority, but this is not popular politically, so the District intends to replace meters as funds allow each year. Advantages and disadvantages for this work are presented in **Table 4-9**.

Table 4-9 - Meter Replacement - Advantages and Disadvantages

Component	Advantages	Disadvantages
Meter Replacement	Improved general operations. Increased accuracy of metering system. Reduced labor necessary to read meters. Meter reading during winter months to help identify potential customers leaks. Potentially increased available flow to the customer with a larger meter orifice. Decreased volume of non-revenue water.	Increased water rates to fund improvements.

4.1.7 Meter/Service Line and Pipe Upsizing Projects

These projects include replacement of all service lines in the existing system plus replacement of all pipelines smaller than 6” diameter. The cost of these improvements is more than the District patrons can likely afford but provides the District with costs for long term replacement planning.

Advantages and disadvantages of just Meter Replacement are provided in **Table 4-10.**

Table 4-10 – Meter/Service Line & Replacement of Undersized Pipes Advantages and Disadvantages

Component	Advantages	Disadvantages
Meter/Service Line Replacement	Replacement of aging service lines prior to significant road repair reduces overall costs. Reduced leakage from old service lines	High cost of replacement leading to significantly higher user rates. Significant disruption to current users during construction.
Replacement of Undersized Pipes	Improved fire protection and service. Likely reduction in leakage and non-revenue water. Reduction in risk of pipeline failure and maintenance.	High cost of replacement leading to significantly higher user rates.

4.2 Development of Alternatives with Public Input

4.2.1 Public Input Solicitation, Open Houses, and Public Hearings

Based on the information provided in the previous sections, the Bayview Water and Sewer District (District) sought to solicit input from their users and interested parties regarding the identified system deficiencies and the potential water system improvements to address them. Copies of the relevant information, presentation materials, sign-in sheets, and comments are provided in **Appendix 4-A**. It should be noted that Project E was added later at the Board’s request and was not part of the public process.

Public Survey (January – April 2018)
J-U-B ENGINEERS, Inc. (J-U-B) first assisted the District with the creation of a public survey that was made available online (surveymonkey.com) and via paper copy. This survey was advertised on the District's website, on its billing statements, and on the posting board in the Bayview Post Office. It was also discussed at regular Board meetings which had been well-attended. This survey began in January 2018 and remained open until April 20, 2018. A total of 64 responses were received (online and paper).

In this survey, the respondents were able to indicate some of the issues (if any) that they had experienced with the water system, as well as their priorities for moving forward with the planning efforts. Affordability (balancing reasonable rates with needed improvements) and Reliability (replacing aging infrastructure, service outages) were indicated to be the highest priorities of the respondents. A copy of the survey and the summary of the responses are included in **Appendix 4-A**.

Public Workshops (April – July 2018)
The District held seven public workshops from April through July 2018 at the J-U-B office in Coeur d'Alene and at the Bayview Community Center to review the latest data, discuss next steps and brainstorm potential solutions. These workshops were advertised as special meetings of the board and the public was invited to attend. The District held workshops on the following dates:

- April 4, 10 and 24, 2018.
- May 2, 2018.
- June 12 and 26, 2018.
- July 16, 2018.

District-provided minutes for all the special meetings (as well as other relevant board meetings) have been included in **Appendix 4-A**.

Open House 1 (May 17, 2018)
The board held an informal open house following their regular board meeting on this date. The known system deficiencies and a large format map of the District (based on the GIS data) was provided for review and discussion with the public. The public was also able to ask questions of the board, staff, and an engineer. The information presented at this informal open house is included in **Appendix 4-A**.

Public Hearing 1 (June 20, 2018)
The District advertised and held this public hearing to share the known system deficiencies with the public and solicit comments regarding their opinion regarding potential projects that were being considered. Attendees were asked to sign-in and were provided an opportunity to provide written comment. Laura McAloon (bond counsel) and Katy Baker-Casile (IDEQ) were in attendance to answer questions along with the District Board and J-U-B staff. Copies of the affidavit of publication, sign-in sheets, presentation materials, and comments from this meeting are provided in **Appendix 4-A**.

Public Hearing 2 (July 26, 2018)
The District advertised and held this public hearing with the goal to update their customers with the estimated costs of the projects and receive public comment regarding the project's packages. Attendees were asked to sign-in and were provided an opportunity to provide written comment. Once again, Laura McAloon (bond counsel), Katy Baker-Casile (IDEQ), and J-U-B staff were available to answer any questions. Over 43 people attended this hearing. No written comments were received back from this public hearing, but hand-outs were made available to the public.

In response to previous requests for time for the public to review the options, an Open House for August 16, 2018 was announced as a time when the public could return and indicate their preferences for the various projects that were being considered. Copies of the affidavit of publication, sign-in sheets, presentation materials, and hand-outs from this meeting are provided in **Appendix 4-A**.

Open House 2 (August 16, 2018)
The District's goal of this open house was to answer any outstanding questions that the public had and then allow them to indicate their preferences for the various project packages. Once again, Laura McAloon (bond counsel) and Katy Baker-Casile (IDEQ) were in attendance as well as J-U-B staff and the District. A board where the public could place small stickers to indicate their first (green dot) and second (red dot) preferences was utilized to collect this input. While over 100 people attended this open house, about 85 people placed their stickers on the board. However, another 41 people who could either not attend or were not able to place stickers on the board indicated their preferences to the open house moderator (either in person or via e-mail).

While this exercise was not an official voting scenario or ballot measure, the District wanted to gather input from their customers regarding their preferred alternative. A summary of the information gathered from the project preference exercise is presented in **Figure 4-5**. Costs for each Project have been updated since the information in **Figure 4-5** was generated. The figure is included here to document public preference for Projects in August 2018.

Figure 4-5 – Summary of Public’s Project Preferences (August 2018)

Bayview Water and Sewer District: Project Preferences						
Project	Project A New Tank	Project B Rehab Existing Farragut Reservoir, New Dromore Reservoir	Project C Minimum Project	Project D “No Action”	Meter Replacement Project Add on to Project A, B, or C	
Total Estimated Cost	$2,150,000	$1,700,00	$1,100,000	$0	$500,000	
Estimated Monthly User Fee Impact	$16.17	$12.79	$8.27	$8.00	$3.76	
Results from Dots Placed at Open House (Approx. 85 people; 77 registered voters)*						
First Project Preference: Green Dot	50	4	32	3	Should the meters be included in the selected project?	
Second Project Preference: Red Dot	37	14	32	2	YES	NO
Total Dots (1st and 2nd)	87	18	64	5	35	48
Weighted Scores (1st=2 pts; 2nd=1pt)	137	22	96	8		
Results from Preferences Noted Via Email/Proxy/Once Dots Ran Out at Open House (41 people; 33 registered voters)*						
First Project Preference: Green Dot	30	0	6	5	Should the meters be included in the selected project?	
Second Project Preference: Red Dot	8	14	4	1	YES	NO
Total Dots (1st and 2nd)	38	14	10	6	12	13
Weighted Scores (1st=2 pts; 2nd=1pt)	68	14	16	11		
OVERALL RESULTS* (Approx. 126 people; 110 registered voters)						
First Project Preference: Green Dot	80	4	38	8	Should the meters be included in the selected project?	
Second Project Preference: Red Dot	45	28	36	3	YES	NO
Total Dots (1st and 2nd)	125	32	74	11	47	61
Weighted Scores (1st=2 pts; 2nd=1pt)	205	36	112	19		

4.2.2 Bond Elections

The District ran two water revenue bonds to obtain authority to occur debt for funding Project A – New Storage, New Transmission, and New Distribution in November 2018 and May 2019. Both bonds failed by a considerable margin.

4.3 Selected Alternative

The District indicated “Project A – New Storage, New Transmission, and New Distribution” was its recommended alternative at its August 23, 2018 Board Meeting based on input from the public and

District staff as well as recommendations from J-U-B. At that time, they also decided to include the project to install the new water meters.

A Technical Review Submittal the Facility Plan was submitted to the Idaho Department of Environmental Quality (IDEQ) on February 14, 2019. Review comments were received from IDEQ on August 5, 2019. A copy of the letter with review comments, J-U-B's response letter included with the resubmittal for technical approval is included in **Appendix 4-B**.

Feedback obtained from District patrons following the failed bond elections indicated significant concerns with the new tank and the cost of the project. As a result, the Board voted to adopt Project "E" as the preferred alternative on January 21, 2020.

4.4 Summary of Anticipated Potential Environmental Impacts

Based on a December 6, 2018 environmental scoping conference call with IDEQ, it is anticipated that a majority of the proposed improvements would eligible for a Categorical Exclusion (CatEx) environmental determination should the District pursue an IDEQ State Revolving Fund (SRF) loan to fund construction of the system improvements. However, projects that involve installing new pipeline or a storage facility not in or along existing alignments or locations would require a Finding of No Significant Impact (FONSI) determination. IDEQ provided preliminary environmental review comments for the Facility Plan per a letter from Adam Oliver dated March 29, 2019. See Technical Memorandum No. 5 for additional information on IDEQ's review comments.

Verbal and e-mail communication with IDEQ indicate that a cultural resources survey will likely be required for proposed improvements prior to construction per agency consultation comments received from the Idaho State Historic Preservation Office (SHPO). See Technical Memorandum No. 5 for additional information on the agency consultation process.

The information that is presented in **Table 4-11** provides an initial screening and summary of the anticipated potential environmental impacts associated with each alternative. Agency consultation comments have been incorporated.

The facility plan was updated to reflect the selection of Project "E". IDEQ provided technical approval of the plan on May 7, 2020 (See Appendix 4-B). The District formally presented Project "E" to the public on June 4, 2020 and received comments until June 18, 2020. The public comments and Board response can be found in Appendix 4-C.

Table 4-11 – Summary of Environmental Concerns for Considered Alternatives

Environmental Criteria	Description	Potential Impacts: No Action	Potential Impacts: Project A – New Storage and Transmission	Potential Impacts: Project B – Rehab Storage and Transmission	Potential Impacts: Project C – Minimum Project	Project E – Rehab Existing Storage, New Transmission, New Distribution
Physiography, Topography, Geology, and Soils	The topography of the District generally slopes toward Lake Pend Oreille. Elevations range from approximately 2,070 feet above mean sea level (AMSL) to 2,580 feet AMSL. Soil in the area are typical sands and gravels.	None Identified.	Temporary, Short-Term Impact – Excavation and/or site disturbance for construction.	Temporary, Short-Term Impact – Excavation and/or site disturbance for construction.	Temporary, Short-Term Impact – Excavation and/or site disturbance for construction.	Temporary, Short-Term Impact – Excavation and/or site disturbance for construction.
Population	The District selected a growth rate of 2% for the planning period.	None Identified.	Positive, Long-Term Impact – Provides improved service to existing patrons. Provides advance planning for and funding of future needs.	Positive, Long-Term Impact – Provides improvement of service to existing patrons (Dromore Area only). Rehabs existing main tank but a new tank will still need to be constructed in the future.	Positive, Short-Term Impact – Rehabs existing main tank, but a new tank will still need to be constructed in the future.	Positive, Long-Term Impact – Provides improved service to existing patrons. Provides advance planning for and funding of future needs.
Surface and Groundwater Hydrology	Lake Pend Oreille is the main surface water body in the District's service area. The Spokane Valley-Rathdrum Prairie Aquifer in the main groundwater formation in the area. Depth to groundwater ranges from 80 to 220 feet. The aquifer is designated as a Sole Source Aquifer. Surface water and groundwater quality are generally good.	None Identified.	None Identified.	None Identified.	None Identified.	None Identified.
Flora, Fauna, and Natural Communities	The District's service area and the surrounding region provide valuable habitat for a variety of plant and animal species typical of the Idaho panhandle. Lake Pend Oreille has been designated as critical habitat for Bull Trout by the U.S. Fish and Wildlife Service. There is no Salmon Essential Fish Habitat (EFH) in the vicinity of the proposed improvements.	None Identified.	Temporary, Short-Term Impact – Increased noise, dust, and ground disturbance from construction activities. No adverse impacts expected to Bull Trout.	Temporary, Short-Term Impact – Increased noise, dust, and ground disturbance from construction activities. No adverse impacts expected to Bull Trout.	Temporary, Short-Term Impact – Increased noise, dust, and ground disturbance from construction activities. No adverse impacts expected to Bull Trout.	Temporary, Short-Term Impact – Increased noise, dust, and ground disturbance from construction activities. No adverse impacts expected to Bull Trout.
Housing, Industrial, and Commercial Development	The District's service area includes mostly residential land uses, a small number of commercial users, and no industrial connections.	None Identified.	Positive, Long-Term Impact – Provides improved service to all existing patrons. Provides advance planning for future needs.	Positive, Long-Term Impact – Provides improvement of service to existing patrons (Dromore Area only). Rehabs existing main tank, but a new tank will still need to be constructed in the future.	Positive, Short-Term Impact – Rehabs existing main tank, but a new tank will still need to be constructed in the future.	Positive, Long-Term Impact – Provides improved service to all existing patrons. Provides advance planning for future needs.
Cultural Resources	The Idaho National Register of Historic Places lists the Lake Pend Oreille Lime and Cement Industry Historic District within the District's boundaries. The Bayview Lime Kilns is a historic property within the District. The nearest Native American territory to the project area is the Kalispel Tribe of Indians. No known sites of Native American cultural significance are known to exist within the District.	None Identified.	None Identified. No construction anticipated near the identified area of potential concern. Consultation with SHPO indicates a cultural resources survey will be required for proposed improvements prior to construction.	None Identified. No construction anticipated near the identified area of potential concern. Consultation with SHPO indicates a cultural resources survey will be required for proposed improvements prior to construction.	None Identified. No construction anticipated near the identified area of potential concern. Consultation with SHPO indicates a cultural resources survey will be required for proposed improvements prior to construction.	None Identified. No construction anticipated near the identified area of potential concern. Consultation with SHPO indicates a cultural resources survey will be required for proposed improvements prior to construction.
Utility Use	Utility use is mainly by single-family residences with some commercial users.	None Identified. Utility use will likely remain the same regardless of system condition.	None Identified. Utility use will likely remain the same regardless of system condition.	None Identified. Utility use will likely remain the same regardless of system condition.	None Identified. Utility use will likely remain the same regardless of system condition.	None Identified. Utility use will likely remain the same regardless of system condition.
Floodplains and Wetlands	Flooding in the District is associated with Lake Pend Oreille, although flooding is rare due to lake level control by the Albeni Falls Dam. Wetlands are small and located directly next to Bayview Creek.	None Identified.	None Identified. Any crossing of Bayview Creek is anticipated to be in areas where existing culverts already exists. A new tank location would be located away from any portion of the wetlands associated with Bayview Creek.	None Identified.	None Identified.	None Identified.
Wild and Scenic Rivers	There are no creeks, streams, rivers, etc. in the vicinity of the District's service area that have a Wild and Scenic designation.	None Identified.	None Identified.	None Identified.	None Identified.	None Identified.
Public Health and Water Quality Considerations	There are no major public health concerns in the District or surrounding area.	Negative – System performance will decrease as components age.	Positive, Long-Term Impact – System improvements improve level of service and reduce leakage and contamination potential for whole District.	Positive, Long-Term Impact – System improvements improve level of service (Dromore Area only) and reduce leakage and contamination potential. Rehabs existing main tank, but a new tank will still need to be constructed in the future.	Positive, Short-Term Impact – System improvements reduce leakage and contamination potential. Rehabs existing main tank, but a new tank will still need to be constructed in the future.	Positive, Long-Term Impact – System improvements improve level of service and reduce leakage and contamination potential for whole District.

Environmental Criteria	Description	Potential Impacts				
		No Action	Project A – New Storage and Transmission	Project B – Rehab Storage and Transmission	Project C – Minimum Project	Project E – Rehab Existing Storage, New Transmission, New Distribution
Important Farmlands Protection	Much of the land surrounding the District is currently State Park or National Forest lands. Some small dry land farms exist nearby outside the District's boundary. Areas in and around the District are not classified as Prime Farmland according to the USDA Soil Conservation Service	None Identified.	None Identified.	None Identified.	None Identified.	None Identified.
Proximity to Sole Source Aquifer	There is a Sole Source Aquifer or Sole Source Aquifer Source Area, as defined by the EPA and IDEQ, in the vicinity of the District. The Spokane Valley-Rathdrum Prairie Aquifer is currently the aquifer source for the District's groundwater wells.	None Identified.	None Identified.	None Identified.	None Identified.	None Identified.
Land Use and Development	Much of the land surrounding the District are State Park and National Forest lands. Some small farms are located near the District. Dry land farming is the most common technique used. Areas in and around the District are not classified as Prime Farmland according to the USDA Soil Conservation Service.	Negative – Potential decrease in system performance and/or capacity as the system ages, which affects the District's ability to serve existing patrons. Results in inadequate planning for and funding of future needs.	Positive, Long-Term Impact – Provides improved service to existing patrons within the whole District. Provides proper planning for and funding of future needs.	Positive, Long-Term Impact – Provides improved service to some existing patrons (Dromore Area) and reduce leakage and contamination potential. Rehabs existing main tank, but a new tank will still need to be constructed in the future.	Positive, Short-Term Impact – System improvements reduce leakage and contamination potential. Rehabs existing main tank, but a new tank will still need to be constructed in the future.	Positive, Long-Term Impact – Provides improved service to existing patrons within the whole District. Provides proper planning for and funding of future needs.
Precipitation, Temperature, and Prevailing Winds (Climate)	Precipitation in the District's services area averages about 24.2 inches per year. Temperatures range from an average low near 34° F to an average high near 55.9° F. The prevailing winds in the District's service area average 4.4 miles per hour (mph) and are from the south and southwest along the Purcell Trench.	None Identified.	None Identified.	None Identified.	None Identified.	None Identified.
Air Quality and Noise	The District's service area generally enjoys good air quality. High noise levels are generally not present in the District's service area.	None Identified.	Temporary, Short-Term Impact – Increased noise and dust from construction activities.	Temporary, Short-Term Impact – Increased noise and dust from construction activities.	Temporary, Short-Term Impact – Increased noise and dust from construction activities.	Temporary, Short-Term Impact – Increased noise and dust from construction activities.
Energy Production and Consumption	A majority of the population in the area consumes energy in the form of electricity, natural gas, and wood.	Energy consumption increases as efficiency of aging components decrease, requiring increased energy consumption.	Long-Term Impact – Potential for decrease in energy use as District reduces the amount of non-revenue water by replacing aging infrastructure, which in turn reduces pumping costs and energy demands.	Long-Term Impact – Potential for decrease in energy use as District reduces the amount of non-revenue water by replacing or rehabilitation of aging infrastructure, which in turn reduces pumping costs and energy demands.	Long-Term Impact – Potential for decrease in energy use as District reduces the amount of non-revenue water by replacing or rehabilitation of aging infrastructure, which in turn reduces pumping costs and energy demands.	Long-Term Impact – Potential for decrease in energy use as District reduces the amount of non-revenue water by replacing or rehabilitation of aging infrastructure, which in turn reduces pumping costs and energy demands.
Socioeconomics	Recreation and tourism are the main industries for the area. Some of the largest employers in the area are restaurants and marinas. No low-income or minority groups are expected to be adversely affected. Costs and benefits of the proposed projects will be shared equally by all District water patrons.	Negative – Poor infrastructure may affect the District's ability to serve existing patrons.	Positive – Improves the District's ability to serve existing and future patrons and reduces O&M costs for aging system components. Negative – Potential rate increase to pay for proposed improvements.	Positive – Improves the District's ability to serve existing and future patrons. Negative – Potential rate increase to pay for proposed improvements.	Positive – Improves the District's ability to serve existing and future patrons. Negative – Potential rate increase to pay for proposed improvements.	Positive – Improves the District's ability to serve existing and future patrons. Negative – Potential rate increase to pay for proposed improvements.
Regionalization	The District's water system is adjacent to several privately-owned and operated small water systems.	None Identified.	Positive – While these small systems have indicated that they have no desire to connect at this time, future regulations or failure of their systems may lead to connection in the future. Negative – Rates may increase due to additional administrative, operation, and maintenance costs.	Positive – While these small systems have indicated that they have no desire to connect at this time, future regulations or failure of their systems may lead to connection in the future. Negative – Rates may increase due to additional administrative, operation, and maintenance costs.	Positive – While these small systems have indicated that they have no desire to connect at this time, future regulations or failure of their systems may lead to connection in the future. Negative – Rates may increase due to additional administrative, operation, and maintenance costs.	Positive – While these small systems have indicated that they have no desire to connect at this time, future regulations or failure of their systems may lead to connection in the future. Negative – Rates may increase due to additional administrative, operation, and maintenance costs.

4.5 Implementation and Phasing

Based on review with the BSWD Board, it was determined that the current rate payers are unable to afford the full cost of Project "E". Based on this, the Board will implement the project in phases over the next 10-20 years. The specific projects contained in each phase will be determined based on available funding.

A preliminary phasing plan including cost opinion and rate impact for each phase is presented in **Table 4-12.**

Table 4-12 - Project phasing

Item	Phase I	Phase II	Phase III
Supply			
General Improvements	$32,000		
Well #7 Upgrades	$125,000		
Well #8 Upgrades	$100,000		
Well #8 Generator	$130,000		
Storage			
General Improvements		$25,000	
Rehabilitate Existing Farragut Tank		$750,000	
Distribution			
General Improvements	$85,000		
New Transmission Main (Well #7 to Bayview)[a]	$545,000		
New Distribution Main (south of Bayview to north of Bayview)			$1,250,000
Distribution Extension to Dromore			$275,000
Totals[b]:	$1,017,000	$775,000	$1,525,000
Additional Cost per ER[c]:	$7.76-$8.42	$5.86-$6.37	$11.54-$12.53

a) Excludes pipeline to existing tank and well 8
b) Estimated cost in 2019 dollars. Capital costs assume +20 percent contingency. Includes project design, construction management, prevailing wages, and American Iron and Steel requirements.
c) Monthly costs assume 475 connections with loans ranging from 1.75% for 30 years (IDEQ SRF) to 3.5% for 40 years (USDA RD) with no grant funding

Appendices

Appendix 4-A – Public Involvement Prior to IDEQ Technical Approval
Appendix 4-B – Technical Review Letters
Appendix 4-C – Public Involvement Subsequent to IDEQ Technical Approval

Appendix 4-A

Public Involvement Prior to IDEQ Technical Approval

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Public Survey

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Bayview Water and Sewer District Survey

J-U-B Engineers (JUB) and Bayview Water and Sewer District (BWSD) are beginning the process to develop a Water System Facility Plan. This Facility Plan will include examining the existing water system and identifying any deficiencies or necessary upgrades along with understanding the needs and goals of the community in order to identify a strategic, long-term plan to maintain a safe and reliable water system. The Water System Facility Plan is anticipated to be complete by fall 2018.

Public input will help shape a community-appropriate Water System Facility Plan. Please take a few minutes and answer the following questions to let us know your thoughts and concerns:

1. Where are you connected to the BWSD water system?

__ Not connected

__ Bayview

__ Cape Horn Area (east of slide)

__ Commercial

__ Don't know

2. Have you ever experienced any of the following issues? Select all that apply.

__ No issues

__ Low water pressure

__ High water pressure

__ Low water flow

__ Taste (tastes bad)

__ Odor (smells bad)

__ Color (water looks cloudy or off-color)

__ Other (please specify):

____

____

____

3. Please provide your address so that we can track the water system area where the issues that you listed above occurred (optional, but recommended so that we can better identify potential problem areas in the system)**.**

____

____

____

4. What should be the priority of the BWSD water system in the future (please rank in order of priority from 1 to 4, with 1 being the most important, and use each number only once)**:**

__ Increased fire protection

__ Reliability (replacing aging infrastructure, service outages)

__ Affordability (balancing reasonable rates with needed improvements)

__ Improved water service (increased water pressure/flow/quality)

5. Are you willing to pay more in order to have better water service (see above)**?**

__ Yes

__ No

6. What is the best way to notify you about project updates and any upcoming public open house times?

__ BWSD Website

__ Email (if selected, please provide email address in the "Other" box below)

__ Facebook

__ Other (please specify, or list your email address):

____

____

____

7. Do you have any other additional comments or suggestions for JUB and BWSD to consider during the preparation of the Water System Facility Plan? If so, please explain:

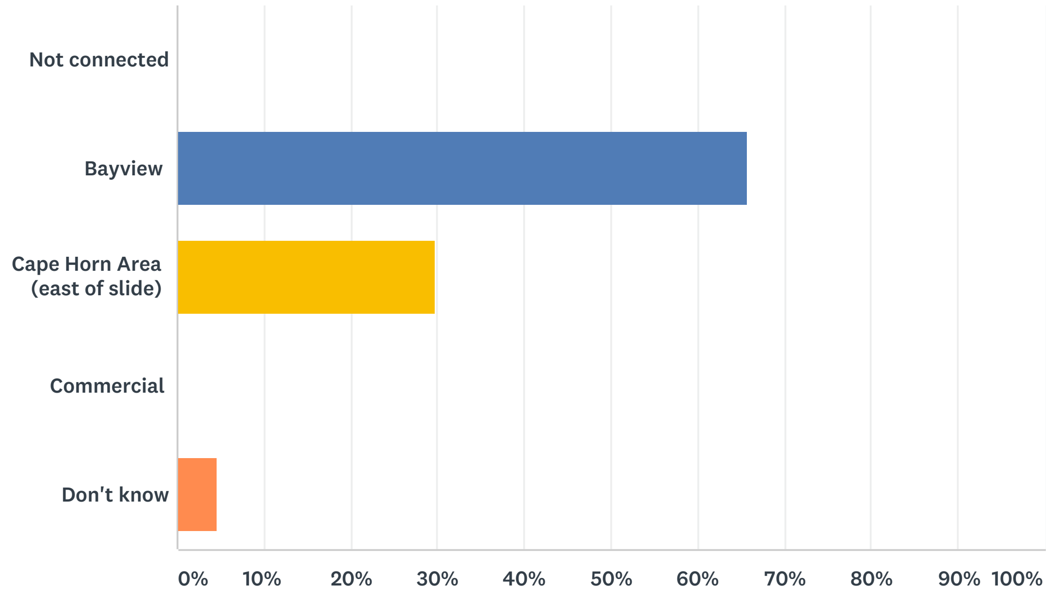
____

____

____

Q1 Where are you connected to the BWSD water system?

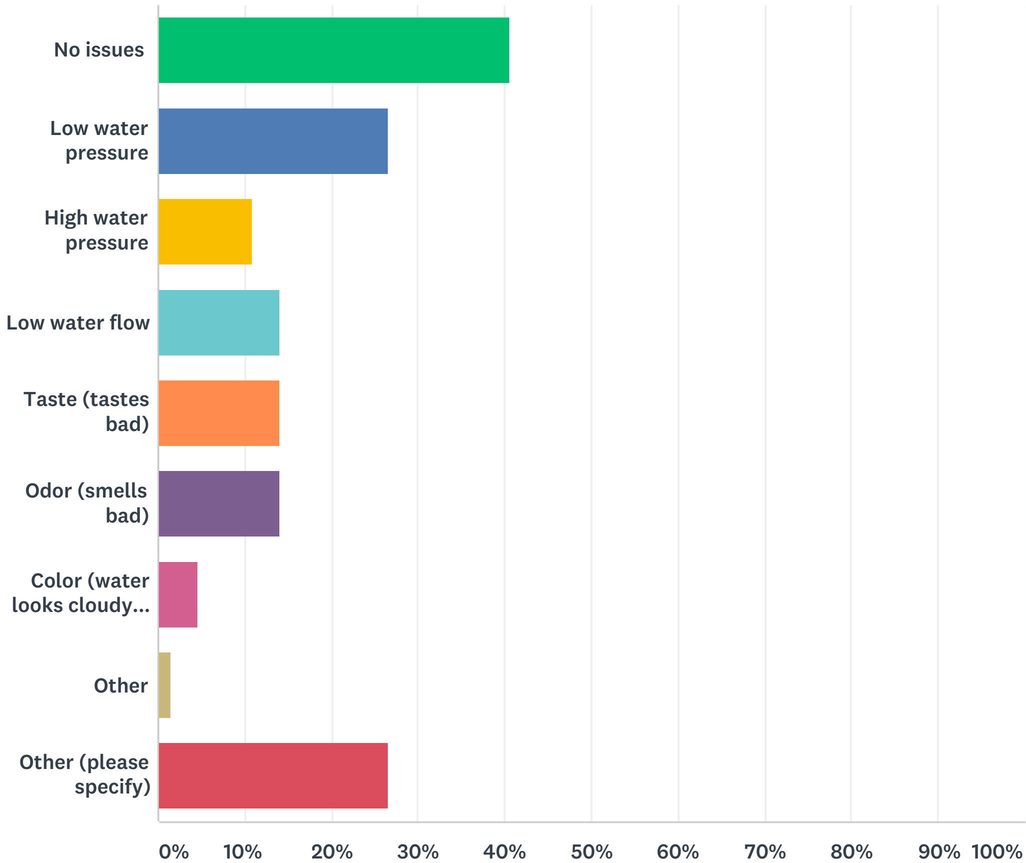
Answered: 64   Skipped: 0



ANSWER CHOICES	RESPONSES	
Not connected	0.00%	0
Bayview	65.63%	42
Cape Horn Area (east of slide)	29.69%	19
Commercial	0.00%	0
Don't know	4.69%	3
TOTAL		64

Q2 Have you ever experienced any of the following issues? Select all that apply.

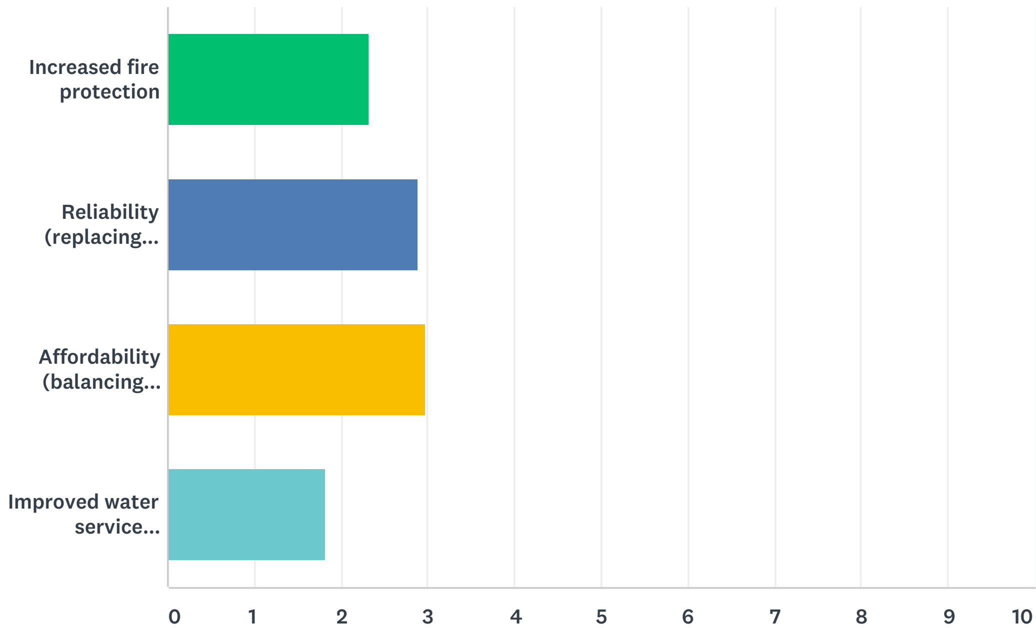
Answered: 64 Skipped: 0



ANSWER CHOICES	RESPONSES	
No issues	40.63%	26
Low water pressure	26.56%	17
High water pressure	10.94%	7
Low water flow	14.06%	9
Taste (tastes bad)	14.06%	9
Odor (smells bad)	14.06%	9
Color (water looks cloudy or off-color)	4.69%	3
Other	1.56%	1
Other (please specify)	26.56%	17
Total Respondents: 64		

Q4 What should be the priority of the BWSD water system in the future (please rank in order of priority, with 1 being the most important):

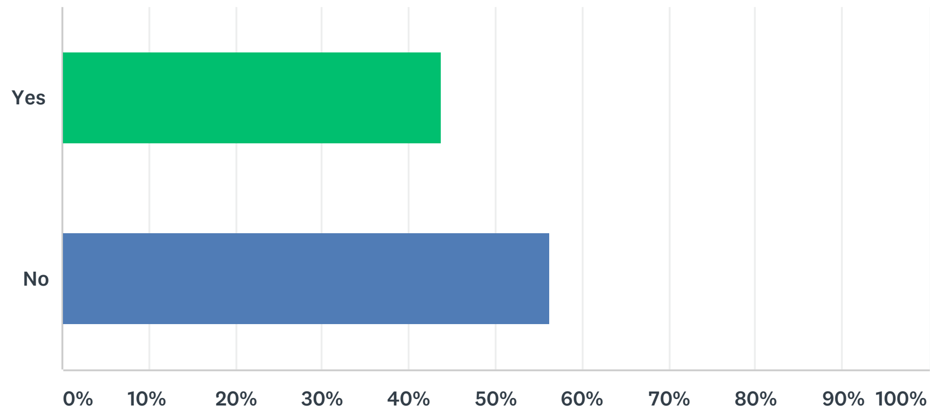
Answered: 64 Skipped: 0



	1	2	3	4	TOTAL	SCORE
Increased fire protection	21.88% 14	18.75% 12	29.69% 19	29.69% 19	64	2.33
Reliability (replacing aging infrastructure, service outages)	28.13% 18	39.06% 25	25.00% 16	7.81% 5	64	2.88
Affordability (balancing reasonable rates with needed improvements)	43.75% 28	21.88% 14	21.88% 14	12.50% 8	64	2.97
Improved water service (increased water pressure/flow/quality)	6.25% 4	20.31% 13	23.44% 15	50.00% 32	64	1.83

Q5 Are you willing to pay more in order to have better water service (see above)?

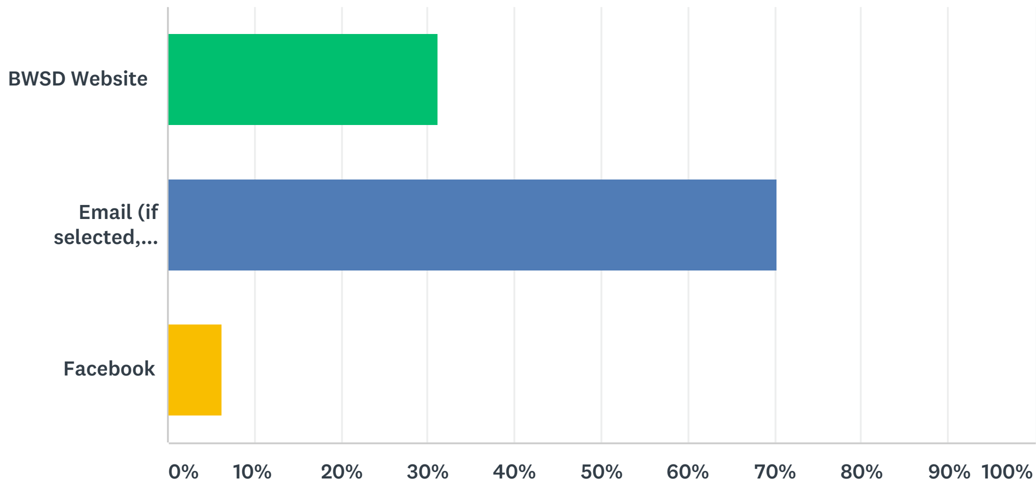
Answered: 64   Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	43.75%	28
No	56.25%	36
TOTAL		64

Q6 What is the best way to notify you about project updates and any upcoming public open house times?

Answered: 64 Skipped: 0



ANSWER CHOICES	RESPONSES	
BWSD Website	31.25%	20
Email (if selected, please provide email address in the "Other" box below)	70.31%	45
Facebook	6.25%	4
Total Respondents: 64		

Q7 Do you have any other additional comments or suggestions for JUB and BWSD to consider during the preparation of the Water System Facility Plan? If so, please explain:

Answered: 43 Skipped: 21

#	RESPONSES	DATE
1	Doing much better than the old Board. Wonderful transparency! Keep up the good work! Tell Ellery we deserve a 25% discount!	4/11/2018 9:45 PM
2	ask ellery to stop forcing this bond down our throats at every meeting - ask him to talk less and stop giving us the same info at every meeting doesn't the board see that jesse is incompetent? she constantly gives erroneous information to customers, wrong quotes etc. and has caused severe anxiety/frustration to numerous customers - replace her with someone competent enough to spend more that 1 hour a month on the books (which is vital to the viability of the company)	3/24/2018 11:26 AM
3	On the paper survey under Question 7 "There needs to be more openness and honesty. BWSD needs to have open meetings (open meetings is underlined heavily) where the residents can speak freely, not just a board meeting where we're not allowed to speak." is written. <input by=""> NOTE: This survey was entered manually by J-U-B from a paper copy received by J-U-B on 3/12/2018 from an anonymous responder.	3/13/2018 3:33 PM
4	On the paper survey under Question 7 "Update meter boxes" is written. <input by=""> NOTE: This survey was input manually by J-U-B from a paper copy received by J-U-B from an anonymous responder.	3/13/2018 3:27 PM
5	On the paper survey under Question 7 "Please represent the public - "listen" to what they have to say & take their comments into consideration at the Bayview Water & Sewer meetings. Thank you." was written. <input by="">. NOTE: This survey was entered manually by J-U-B from a paper copy received by BWSD on 3/12/2018 from an anonymous responder.	3/13/2018 3:22 PM
6	NOTE: This survey was entered manually by J-U-B from a paper copy received by BWSD on 3/8/2018 from an anonymous responder.	3/13/2018 3:10 PM
7	NOTE: This survey was entered manually by J-U-B from a paper copy received by BWSD on 3/7/2018 from an anonymous responder.	3/13/2018 3:08 PM
8	NOTE: This survey was entered manually by J-U-B from a paper copy received by BWSD on 3/7/2018 from an anonymous responder.	3/13/2018 3:03 PM
9	On the paper survey under Question 7 "When I moved to Bayview, it was my understanding the BWSD would pump septics when needed. I've been told this is no longer the case. Can you please clarify?" is written. NOTE: This survey was entered manually by J-U-B from a paper copy received by BWSD on 2/26/2018 from an anonymous responder.	3/13/2018 2:59 PM
10	NOTE: This survey was entered manually by J-U-B from a paper copy revieved by BWSD on 2/26/2018 from an anonymous responder.	3/13/2018 2:53 PM
11	NOTE: This survey was entered manually by J-U-B from a paper copy received by BWSD on 2/26/2018 from an anonymous responder.	3/13/2018 2:35 PM
12	Hire local help.	3/13/2018 1:54 PM
13	Find a way to update the system by retrofitting parts as they fail, with a goal of incremental improvements and not plan on one major system update.	3/9/2018 7:30 PM
14	No	2/18/2018 6:28 PM
15	Question 5 leaves no room for explanation. Would be willing to pay more but not erroneous amount fire improvements that may or may not be necessary.	2/16/2018 7:49 PM
16	I think that we need to fix what needs to be fixed and than make sure our water system will or can operate effectively. But it does not need to be the latest greatest state of the art water system. We are a tiny little community with very little growth.	2/16/2018 10:31 AM

17	On the paper survey under Question 4, after Reliability "(replace aging infrastructure," is struck through and "service outages)" is circled. After Affordability "(balancing reasonable rates" is circled and "with needed improvements)" is struck through. After Improved water service "(increased water pressure/flow/quality)" is struck through and "by contractor." is written in its place. On the paper survey under Question 5, after No was checked, the following was written: "I feel we will get poorer water service than the people you got rid of that did know the system!!! & higher rates." On the paper survey under Question 7, the following was written: "In reference to J-U-B - Did you know that a few years ago J-U-B was hired to do some work for $5,000 and did get fired by Neil Peck. They did bill our water system $11,000. But history repeats itself. This may not be factual, but I would bet it is. I have heard that our water system is OK. If the new contractor cannot run or start pumps is that he did not know how they operate. He should learn the system instead of buying new system. This is just a way to add to our cost. The same applies to the leach field. You got rid of 3 very knowledgeable employees (that knew the system) (cared for the people owing the system) and (did a good job) We will pay for this mistake, when you raise the rates, and I know you will!!" NOTE: This survey was entered manually by J-U-B from a paper copy received by BWSD on 02/07/2018 from Dale Bymaster.	2/14/2018 3:51 PM
18	Our concern, besides the low water pressure, is with a new board raising our rates in order to fix an antiquated water system. Is there an alternative solution that wouldn't be cost prohibitive? NOTE: This survey was entered manually by J-U-B from a paper copy received by J-U-B on 02/07/2018 from Bob and Kea Fisher.	2/14/2018 2:24 PM
19	Fiscal responsibility MUST come before massive debt creation. Deficit spending currently indicates a rate increase just to sustain daily operations - not because income resources are inadequate, but rather, because the board chooses to subject our district exclusively to contract operators, with no control over costs. Current board and contract operators talk about state of the art industry standards, whether the budget can accommodate this or not. Operator convenience (automatic generators, automatic systems, remote operations etc) appear to take precedence over budget and available resources. Inexperienced board leaving the district open to increase risk and liability, no contract oversight and monitoring processes in place for the system we currently have, let alone protecting the value of a new, modern, fully updated system we cannot afford Our community does not need a gold plated system...unless the current board would like to fund it with their own money. I cannot believe the level of dishonesty regarding budget and expenditures, blame and lack of accountability on-going since Rich Doney became chairman. I will not be supporting any plan that cannot be paid for within the current budget and resources, simply because the board has elected to substantially increase the cost of operations with no consideration to the desires of the community. I believe this will be heard loud and clear once hearings are scheduled and held.	2/14/2018 9:20 AM
20	We are relatively new to the area and are absolutely astounded at the unprofessional, vindictive and financially irresponsible board of directors. We are not willing to pay any increases while this misdirected group of individuals are running the district.	2/13/2018 4:42 PM
21	7. 7. We are not willing to pay more for water due to the current board's spending and lack of transparency. The costs are not justified, and the board's spending without concern for the public or allowing public comment is not financially responsible or transparent. Backdoor meetings are held and witnessed in public places where crucial decisions are made without input from the public. Until this board stops retaliating and harassing those that walked up to the forest service road to document the spill or any other concerns, abides by the Open Meeting Laws, provides and responds to records requests in accordance with Idaho Statutes – Title 24 "Transparent & Ethical Government" and considers the citizens of the district they are supposed to serve without sarcasm, degrading disrespectful attitudes displayed by themselves and office staff, we will not support any fee increases. In attempt stop public inquiry, this board, without notification of cost is now trying to extort additional funds for any records requests, past and present and will not provide the records unless all unjustified and unreasonable fees are paid.	2/13/2018 2:38 PM
22	Modify rate structure so residents can afford to water lawns in summer, because of cost lawns are allowed to dry up increasing fire danger.	2/6/2018 8:39 PM
23	Make sure that it includes safety and backup plans, Emergency Response plans, and Capital Improvement funds establishment. NOTE: This survey was completed online by JUB based on a paper copy submitted to BWSD by T. Bumgarner on 2/5/18. NOTE: Q4 - "fire flow" was ranked equally with "improved water service" on the paper copy.	2/6/2018 12:06 PM
24	Honestly this water taste awful and has an odor. I will not drink it unless it's for coffee. I seriously have considered taking a sample to have tested because it's so bad and I want to make sure it's not causing a health risk.	2/5/2018 9:09 PM

25	The water rates should be adjusted so customers could afford to water their lawns in the summer, now it is cost prohibitive and everyone lets the lawns dry out which increases fire danger.	2/3/2018 12:35 PM
26	Make the WSFP draft available for review and input prior to adoption. Work to increase overall efficiency so system improvements do not greatly increase costs.	2/2/2018 4:40 PM
27	No	2/2/2018 10:46 AM
28	Review use and possible sale of BWSD offices and surrounding property.	2/2/2018 2:40 AM
29	Address the diverted water flow from the mountain caused by all the additional building. Assign some responsibility to the owner of the property to address detrimental changes to the water paths causing flooding, mud sliding, washouts of the road.	2/1/2018 9:12 PM
30	Do not extend sewer service east of the slide!	2/1/2018 8:49 PM
31	The area is certain to grow. We need to be forward thinking about the needs for water and sewer and do what is needed now to help everyone.	2/1/2018 12:34 PM
32	please consider having a board that has some experience in water and sewer because the current board is useless and are just pawns for JUB and the engineer to tell them what to do and they blindly say ok	1/31/2018 7:36 PM
33	We do not water our lawn and rarely use our cabin so I don’t think we should have to pay an increase compared to those that are full time residents.	1/31/2018 7:25 PM
34	Water should be cheaper in the summer so people can afford to keep their lawns green which would help with fire prevention.	1/31/2018 6:05 PM
35	The board is doing an outstanding job!!!!!	1/31/2018 5:45 PM
36	No	1/31/2018 1:33 PM
37	We believe the water board is doing a very good job	1/31/2018 12:57 PM
38	Consider putting at least a simplified version of routine water quality monitoring reports on the website, including reports of when chlorine or other treatment is added.	1/31/2018 12:21 PM
39	Yes I do not want a $3mill bond to go through. BW&S is working on going bankrupt. Instead of going into debt take care of issues and fix them as they come up.	1/29/2018 8:31 PM
40	It is important to respect equity within the service area and insure that areas that are more expensive to serve are charged in proportion to the cost of service	1/26/2018 3:25 PM
41	I think the Board is doing a fabulous job and they are truly dedicated people!	1/26/2018 9:04 AM
42	Keep up the great work Ellery ! Rich	1/22/2018 11:04 PM
43	TEST	12/6/2017 9:51 PM

THIS PAGE WAS INTENTIONALLY LEFT BLANK

BWSD Minutes

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Bayview Water & Sewer District
7825 N Meadowlark Way, Coeur d'Alene, ID 83815

SPECIAL MEETING MINUTES
April 4, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 2:30 PM and a roll call confirmed that Vice-Chair Sharon Meyer, directors Stephen May, Robyn Edwards and Jan Jones were also present.

Others Present: Bob Kuchenski, District operator and Jessie Roe, District Treasurer.

Guests Present: Danielle Quade with Hawley Troxell, Ellery Howard with JUB Engineers and a member of the public Colleen Dahlseid.

Consent Agenda and Minutes: Chairman Doney started with an amendment to the consent agenda and added ‘Meter tampering – 33708 N. Fir’ the reason for the amendment being the issue occurred this morning and timeliness is necessary. Mr. May made a motion to approve the amended agenda with a second from Ms. Edwards. All were in favor, motion carried.

Agenda Items:
1. Meter Tampering – 33708 N. Fir: The Board directed staff to file a report with the sheriff’s office against the occupying tenant, at the homeowner’s request, for tampering with and breaking District property with a value of $2,700, following a motion from Ms. Edwards, seconded by Ms. Meyer. All were in favor, motion carried.
2. Danielle Quade with Hawley Troxell: Ms. Quade educated the Board on forming a bond counsel and reviewed important filing dates as well as proper procedure. The Board asked Ms. Quade to attend their quarterly board meeting, held in the evening, to educate District customers and encourage public awareness. This meeting will be May 17, 2018 at 7:00 PM at the Bayview Community Center.
3. Water System Facility Plan: Numerous topics were discussed, including:
    I. Water Source: Quality and existing facilities appear to require little improvement but attention to standby power, telemetry, and technical ownership of the main water tower need to be addressed.
    II. Storage concerns: The existing main reservoir (Farragut), built in 1942, will require significant repair and re-coating/re-sealing both inside and out. Leaking could be causing damage to concrete reinforcement steel. Between 3000 and 6000 feet of supply piping also requires repair and/or replacement. The Dromore tank is undersized and those who receive their water supply from this tank complain of low pressure.
    III. Distribution: After performing the reservoir probe testing for approximately ten days and much analysis it appears the District is consistently losing around 127,000 per day with an additional 1100 GPM, for thirty minutes, drop every twenty hours. This is a significant leak and the Board is working with the engineers to reduce losses from non-revenue water production. Areas to investigate include: aging and undersized meters not accurately capturing water use, Naval base connections being un-metered and actual use is

unknown, leaking transmission lines in Farragut area as well as a few other distribution lines are of concern. Pressure is also a concern for customers and the Board in certain areas. It is recommended to start with rebuilding and performing regular maintenance on the Pressure Reducing Valves (PRV) in the District to obtain optimum performance. The Dromore tank would require a new tank or higher elevation to correct.

Another meeting will be scheduled April 10, 2018 to discuss:

i. Reducing pumping costs
ii. Increasing fire protection; improving water supply and evaluating hydrant location, spacing and uniformity.
iii. Setting an official end date to the public water quality survey
iv. Setting boundary and projected growth rate of District
v. Further discussion of potential system issues and potential projects

With no further business to discuss the special meeting was adjourned at 5:16 PM following a motion from Ms. Edwards, seconded by Ms. Meyer. All were in favor motion carried.

Respectfully Submitted and Approved:

Jessie Roe	Richard Doney
Administrative/Treasurer	Chairman of the Board

.

Bayview Water & Sewer District

7825 N Meadowlark Way, Coeur d'Alene, ID 83815

SPECIAL MEETING MINUTES

April 10, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 1:00 PM and a roll call confirmed that Vice-Chair Sharon Meyer, directors Stephen May, Robyn Edwards and Jan Jones were also present.

Others Present: Bob Kuchenski, District operator and Jessie Roe, District Treasurer.

Guests Present: Ellery Howard with JUB Engineers and members of the public Colleen Dahlseid, Karen Renner, Ken Saunders and Marsha Ritzheimer.

Consent Agenda and Minutes: Ms. Jones made a motion to approve the consent agenda with a second from Ms. Meyer. All were in favor, motion carried.

Agenda Items:

1. Workshop regarding potential infrastructure projects for the Water System Facility Plan:
   a) Discuss study boundary and projected growth rate: The Board agreed the main potential area for growth in the next 20 years would be west on Perimeter Road past the Bayview post office. Other potentials are lot splits already inside District boundary and future inclusion of small water systems inside District boundary.
   b) Further Discussion of Potential System Issues and Potential Projects: The Board talked about the leaks occurring at the main water tower through the sides as well as the bottom of the reservoir. Cost for re-sealing the tank and replacing known leaks in the main line leading into town need to be weighed against the cost of building a new tank and abandoning the old line. The Board directed Mr. Howards to perform a full analysis with costs involved. Ms. Meyer motioned to have Ms. Edwards organize a meeting with the facilities manager of the naval base to determine tower ownership as well as possible spikes in water use, seconded by Ms. Jones. All were in favor, motion carried.

At the next meeting the Board plans to itemize the project list and start putting some costs to the projects before presenting to the public.

With no further business to discuss the special meeting was adjourned at 4:07 PM following a motion from Ms. Jones, seconded by Ms. Meyer. All were in favor motion carried.

Respectfully Submitted and Approved:

______________________________	_________________________
Jessie Roe	Richard Doney
Administrative/Treasurer	Chairman of the Board

Bayview Water & Sewer District

7825 N Meadowlark Way, Coeur d'Alene, ID 83815

SPECIAL MEETING MINUTES

April 24, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 1:05 PM and a roll call confirmed that Vice-Chair Sharon Meyer, directors Stephen May, Robyn Edwards and Jan Jones were also present.

Others Present: Bob Kuchenski, District operator and Jessie Roe, District Treasurer.

Guests Present: Ellery Howard and Gemma Puddy with JUB Engineers and members of the public Colleen Dahlseid and Marsha Ritzheimer.

Consent Agenda and Minutes: Ms. Edwards made a motion to approve the consent agenda with a second from Mr. May. All were in favor, motion carried.

Agenda Items:

1. Workshop regarding potential infrastructure projects for the Water System Facility Plan:
   a) Gemma Puddy introduced herself and explained that she is a public communications special inside JUB and works to fill the informational gap between the public and upcoming projects.
   b) Ms. Edwards informed the Board of her meeting with Keith Thomas and Alan Griffith with the Bayview Naval Base to discuss ownership of the main water tower in Farragut. It was determined that water tower is on a 50 year lease to the District and expires 2027.
   c) Another probe test will be performed on the water tower to verify significant water loss findings.
   d) Chairman Doney researched the smaller water systems inside the BWSD boundaries and determined there to be four smaller systems:
      - McKinley - 13 connections and members pay $100 per year
      - Schaeffer – 20 hookups and members pay $150 per year
      - Bayview Heights – 9 hookups and members pay $150 a year (18 taps available)
      - Silver Water – 19 hookups and members pay $150 a year
   e) The Board discussed the outlined projects in prior meetings and decided to hold a special meeting May 2, 2018 at 1:00 PM at the Bayview Community Center to bring all the information to the public. This will help when it comes time to hold a public hearing on project funding. The Board requested that Mr. Howard bring a cost analysis workup consisting of package options and estimated costs to user fees for each package to the next workshop.

With no further business to discuss the special meeting was adjourned at 3:43 PM following a motion from Ms. Meyer, seconded by Ms. Edwards. All were in favor motion carried.

Respectfully Submitted and Approved:

_______________________________	___________________________
Jessie Roe	Richard Doney
Administrative/Treasurer	Chairman of the Board

Bayview Water & Sewer District

20298 E Perimeter Rd, Bayview, ID 83803

SPECIAL MEETING MINUTES

May 2, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 1:03 PM and a roll call confirmed that directors Stephen May, Robyn Edwards and Jan Jones were also present.

Others Present: Jessie Roe, District Treasurer.

Guests Present: Ellery Howard with JUB Engineers and members of the public.

Consent Agenda and Minutes: Ms. Jones made a motion to approve the consent agenda with a second from Mr. May. All were in favor, motion carried.

Agenda Items:

1. Resolution Declaring Certain District Property Surplus – Resolution 2018-001: Ms. Edwards made a motion to approve the resolution followed by a second from Mr. May. All were in favor motion carried.
2. Consider Bond Counsel Representation: The Board decided to hold a special meeting on May 8, 2018 at 3:00 PM at the District office to hear from Laura McAloon on services for bond counsel.
3. Workshop to determine important potential infrastructure projects for funding: Mr. Howard with JUB Engineers presented the topics and project packages discussed in prior workshops (attached).

With no further business to discuss the special meeting was adjourned at 3:12 PM following a motion from Ms. Edwards, seconded by Mr. May. All were in favor motion carried.

Respectfully Submitted and Approved:

______________________________	______________________________
Jessie Roe	Richard Doney
Administrative/Treasurer	Chairman of the Board

Bayview Water & Sewer District

Known Needs:

Non-Revenue Water

- Excessive amount of water that is not metered (at least 50% of water)
    - Contributors:
        - Leaking transmission lines in Farragut Area.
        - Navy Base is unmetered and use is unknown.
        - Aging meters in Bayview Area are inaccurate (read less than actual use).
        - Known leaks in distribution lines.

Low Water Pressure Complaints/Fire Flow

- Bayview Area - along the top of the lower pressure zone.
- North Side of Bayview.
- Dromore Area - low pressure and reservoir is undersized (11K gal).

Long-term Maintenance/Reliability

- Aging infrastructure (major components were installed early 1940's, mid 1970's)
- Auto back-up power needed at Well 7.
- SCADA has some deficiencies, no back-up power at tank site/repeater.

Recommended Projects - Scenario A (New Tank)

1) New Storage Reservoir - North side of Bayview
   - o Description: New large reservoir to serve all of BWSD, replace Farragut Reservoir and small Dromore tank and booster to increase pressure. Consolidates storage and eliminates a booster station.
     Expected Life - 100 years.
   - o Need: undersized Dromore tank (11K gal) and booster, better fire flow, address pressure complaints.

2) New Transmission Main
   - o Description: Abandon portions of aging/leaky line in Farragut Area and install new line from Well 7 to BWSD (2,800 LF).
   - o Need: Replace leaking and aging piping in the Farragut Area.

3) New Distribution/Transmission Mains
   - o Description: Connect wells (south side of town) to new reservoir on north side of town (6,300 LF).
   - o Need: Improve low pressure and flow problems, increase fire flow capabilities.

4) Looping/Repair
   - o Description: connect dead end mains and repair/replace known leaking areas.
   - o Need: Improve low pressure and flow problems, increase fire flow capabilities.

5) Meter Replacement
   - o Description: replace old and inaccurate meters in Bayview area with more accurate radio read meters. Add meters to unmetered locations.
   - o Need: increased accuracy, less labor to read (few hours vs. days), increases available flow to customer.

6) Minor Projects - System Maintenance and Reliability
   - o Description: SCADA upgrades, generator at Well 7, PRV rebuilds (4).
   - o Need: system reliability in emergency or power outage, system optimization (PRV tuning).

Recommended Projects - Scenario B (Rehab Existing Farragut Reservoir)

1) Tank Rehabilitation
   - Description: paint and lining upgrades to extend the usable life (25-30 years).
   - Need: existing tank is 75+ years old and leaking. Existing internal coating is spalling off.

2) Repair or Replace Transmission Mains
   - Description: repair or replace 4,000 LF of aging 12”, 10”, and 8” lines from Well 7 to Tank, and Tank to Navy facility.
   - Need: 75+ years old, known to have had significant leaks, joints are issue (not pipe itself).

3) Dromore Upgrades
   - Description: replace Dromore Reservoir and booster, potentially move new tank to higher elevation, replace lines.
   - Need: undersized reservoir (11K gal) does not supply adequate domestic or fire flow needs.

4) Looping/Repair
   - Description: connect dead end mains and repair/replace known leaking areas.
   - Need: Improve low pressure and flow problems, increase fire flow capabilities.

5) Meter Replacement
   - Description: replace old and inaccurate meters in Bayview area with more accurate radio read meters. Add meters to unmetered locations.
   - Need: increased accuracy, less labor to read (few hours vs. days), increases available flow to customer.

6) Minor Projects - System Maintenance and Reliability
   - Description: SCADA upgrades, generator at Well 7, PRV rebuilds (4).
   - Need: system reliability in emergency or power outage, system optimization (PRV tuning).

“Minimum” Project

1) Repair or Replace Transmission Mains
   - Description: repair or replace 4,000 LF of aging 12”, 10”, and 8” lines from Well 7 to Tank, and Tank to Navy facility.
   - Need: 75+ years old, known to have had significant leaks, joints are issue (not pipe itself).

2) Meter Replacement
   - Description: replace old and inaccurate meters in Bayview area with more accurate radio read meters. Add meters to unmetered locations.
   - Need: increased accuracy, less labor to read (few hours vs. days), increases available flow to customer.

3) Minor Projects - System Maintenance and Reliability
   - Description: Leak repair, SCADA upgrades, generator at Well 7, PRV rebuilds.
   - Need: system reliability in emergency or power outage, system optimization (PRV tuning).

No upgrades to Farragut or Dromore Reservoirs.

“No Action” Project

1) Would continue to waste approximately 50% of pumped water.

2) Would need to establish a repair fund (recommend $200,000 minimum)

3) Would have to address repairs immediately and not have the benefit of very favorable financing terms (30 years, 1.75% interest, $123K principal forgiveness).

4) Current customers would have to pay for system repairs upfront vs. having future users share costs.

Bayview Water & Sewer District
P.O. Box 637, Bayview, Idaho 83803
REGULAR MEETING MINUTES
May 17, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 7:00 PM and a roll call confirmed that Vice-Chair Sharon Meyer, directors Jan Jones, Robyn Edwards and Steve May were also present.

Others Present: District Operators Bob Kuchenski and Ian Kuchenski, District Treasurer Jessie Roe.

Guests Present: Ellery with JUB Engineers as well as members of the public.

Consent Agenda and Minutes: Ms. Jones motioned to approve the proposed agenda with a second from Mr. May. Ms. Meyer motioned to approve the consent agenda: April 2018 financials, minutes from April 10th, 18th as well as May 2nd, 8th, 2018, and approval to pay monthly bills as listed. This motion was seconded by Ms. Jones and all were in favor, motion carried.

Reports:

Operator Report: Mr. Kuchenski reported on the District operations from April 19, 2018 through May 17, 2018 (attached).

Treasurer's Report: Ms. Roe presented the financial report for the month of April 2018 (attached). Ms. Roe also explained the winter excess consumption billing and how the charge is calculated.

Public Matters/Guests:

1. Chris Hansen – RE: Water line break at Bitter End Marina & Baywatch Estate Exemption Request: Mr. Hansen is out of town and asked the Board to table this discussion until the next meeting. The Board tabled it following a motion from Ms. Meyer, seconded by Mr. May. All were in favor, motion carried.

Old/Ongoing Business:

1. JUB Update/discussion: Mr. Howard reviewed the survey responses and explained how the information received would be implemented into the GIS mapping. He also stated there would be an informal open house following the meeting and the public is welcome to view pictures of the proposed project ideas. Mr. May asked how much water loss the District is currently experiencing in a year and Mr. Howard said it is around 50 million gallons a year which is approximately half of all water pumped.
2. Operating Procedures Manual: Ms. Edwards reported the draft is available at the office and needs to be reviewed and modified to fit the Bayview Water & Sewer District. Workshops will be scheduled to finalize the manual.
3. Follow-up on Trees/Bushes covering Fire Hydrants that J.Almeda Brought up in December 2017: Mr. Kuchenski said he will perform this task when the treatment site is done with setup. Ms. Edwards asks Mr. Kuchenski to keep a maintenance log on fire hydrants.

New Business:

1. Hiring of Bond Counsel: Chairman Doney said special meetings were held on April 4th and May 8th to interview the only two local firms for bond counsel, Laura McAloon and Hawley Troxell. Ms. Edwards motioned to sign an engagement letter with Laura McAloon's firm with the request that she include the wording that 'no fees will be incurred by the District should a bond not pass'. The motion was seconded by Ms. Meyer, all were in favor, motion carried.

2. Set Date for Public Hearing RE: Needed District Projects: The Board decided to hold a public hearing at the next regularly scheduled Board meeting on June 20, 2018 at 3:00 PM.
3. Agenda Format: Ms. Edwards reviewed two new laws passed that could impact how the District operates in posting agendas and maintaining public records; Senate Bill 1274 & House Bill 611. Ms. Meyer motioned to create a resolution asserting the Treasurer as the primary custodian of records and a backup as the Vice Chairperson of the District. The motion was seconded by Ms. Jones, all were in favor, motion carried.

Acknowledgement of Correspondence: None

Announcements:

1. Chairman Doney announced they will host an informational open house immediately following the meeting and will address needed proposed projects for the upcoming bond.

With no further business to discuss the regular meeting was adjourned at 4:11 PM following a motion from Ms. Jones, seconded by Mr. May. All were in favor, motion carried.

Respectfully Submitted and Approved:

Jessie Roe
Administrative/Treasurer

Richard Doney
Chairman of the Board

6/20/2018 Bayview Systems Report

A. Water Production update.

6,308,000 gallons produced by the wells during May. 3,264,000 gallons of consumption through customers meters This works out to 210,000 gallons per day produced by the wells of which 109,000 registered through customers meters. This is the equivalent of 230 gallons per day, per service connection. (474 service connections). Unaccounted for water lost is 3,044,000 gallons or 48% of production totals by the wells. The connections with the Navy are not metered. However, it is unlikely that the Navy is using 3 million gallons per month. These figures can be compared with the daily effluent flow figures below.

B. Sewer system production.

Due to the rainy weather and system repairs, starting up the Land Application has been delayed. We have determined that during May, 718,000 gallons of effluent has flowed into the drain field. This works out to 24,000 gallons of effluent pumped daily into our drain field daily. This is well under the drain field capacity of 96,000 gallons per day. Weather permitting, the Land Application should be started for the season by the June Board meeting.

C. General issues.

1. All meters were read in 1 day for the first time at the end of April and again at the end of May. This allowed us for the first time ever to compare consumption with the well production, less the Navy's unmetered use.

2. Sewer maintenance items for the past month include:
   a. Installing rain covers on manholes at the marinas in case of flooding. This prevents potential flood waters from entering the sewer system.
   b. 6 septic tank pumped since mid May. Due to potential flooding, 3 septic tanks at the Scenic Bay Marina, and one each at the Bitterend Marina and Hudson Bay Resort were pumped prior to flooding.
   c. Three of five sand filter beds are now operational in manual mode. A new control valve will be installed in sand filter bed #2.

3. 2017 Annual Water Quality Report is now available.

BAYVIEW WATER & SEWER DISTRICT
YR TO DATE 12/1/2017 THRU 5/31/2018
RESOURCES/EXPENSES
CASH BASIS - PRELIMINARY

	YTD 5/1/2018	May 2018	YTD 5/31/2018	BUDGET 17-18
RESOURCES:				
Certification Fees	$ 2,287.70	$ 132.65	$ 2,420.35	$ 3,500
Sewer Hookups	$ 160.00	$ -	$ 160.00	$ 160
Water Hookups	$ -	$ -	$ -	$ 2,400
Misc. Income	$ 981.36	$ -	$ 981.36	$ -
Rent	$ 1,000.00	$ 200.00	$ 1,200.00	$ 2,400
W&S - User Fees	$ 139,861.86	$ 31,354.86	$ 171,216.72	$ 347,250
Reimbursement Grant	$ 16,885.00	$ 2,780.00	$ 19,665.00	$ 10,000
Interest Income	$ 381.76	$ 76.40	$ 458.16	$ -
TOTAL RESOURCES	$ 161,557.68	$ 34,543.91	$ 196,101.59	$ 365,710
EXPENSES:				
Sewer Maintenance	$ 15,493.92	$ 429.93	$ 15,923.85	$ 48,000
Water Maintenance	$ 25,485.75	$ (4,933.68)	$ 20,552.07	$ 20,000
Vehicle Expense	$ 686.24	$ 197.29	$ 883.53	$ 2,000
Contract Labor	$ 10,611.90	$ -	$ 10,611.90	$ 10,000
Director Fees	$ 950.00	$ 250.00	$ 1,200.00	$ 3,000
Dues & Subscriptions	$ 1,005.97	$ 2.00	$ 1,007.97	$ 1,130
Office Supplies	$ 410.08	$ 9.54	$ 419.62	$ 2,100
System Operator	$ 35,000.00	$ 7,000.00	$ 42,000.00	$ 89,000
Training/Conferences	$ -	$ -	$ -	$ 1,000
Postage & Delivery	$ 838.91	$ 202.25	$ 1,041.16	$ 2,200
License & Permits	$ -	$ -	$ -	$ -
Misc. Expense	$ 5,292.73	$ 1,497.00	$ 6,789.73	
Office Equipment	$ 764.08	$ 12.99	$ 777.07	$ 3,500
Liability Insurance	$ 2,901.00	$ -	$ 2,901.00	$ 6,550
Workman's Comp	$ -	$ -	$ -	$ 2,000
Bank Fees	$ 187.10	$ 12.02	$ 199.12	$ -
Assessment Fees	$ 850.00	$ -	$ 850.00	$ 1,700
Janitorial	$ 200.00	$ 40.00	$ 240.00	$ 480
Professional Fees	$ 41,063.37	$ 13,348.25	$ 54,411.62	$ 41,200
Telephone	$ 1,943.05	$ 366.60	$ 2,309.65	$ 2,840
Electric	$ 19,098.75	$ 3,263.74	$ 22,362.49	$ 43,872
Payroll Expenses	$ 11,419.84	$ 2,808.27	$ 14,228.11	$ 30,000
Capital Additions	$ -	$ -	$ -	$ 55,138
TOTAL EXPENSES	$ 174,202.69	$ 24,506.20	$ 198,708.89	$ 365,710
NET	$ (12,645.01)	$ 10,037.71	$ (2,607.30)	
PLUS BEG BAL	$ 252,087.41	$ -	$ 532,613.81	
AVAIL RESOURCES	$ 239,442.40	$ 10,037.71	$ 530,006.51	
TOTAL AVAILABLE CASH	$ 239,442.40		$ 541,991.20	

DEPOSITED IN:

General O&M	#7564	$ 38,178.75	
Sewer Saving	#8307	$ 28,038.88	
Water Saving	#8299	$ 24,204.67	
LID Guarantee	#1227	$ 110,874.55	
LID Fund	#9680	$ 340,827.32	
TOTAL			**$ 542,124.17**

Bayview Water & Sewer District

7825 N Meadowlark Way, Coeur d'Alene, ID 83815

SPECIAL MEETING MINUTES

June 12, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 12:12 PM and a roll call confirmed that directors Stephen May, Robyn Edwards, Sharon Meyer and Jan Jones were also present.

Others Present: Ellery Howard with JUB Engineers and District Treasurer Jessie Roe

Guests Present: Norma Jean Knowles and Marsha Ritzheimer.

Approval of Agenda: Ms. Edwards made a motion to approve the agenda with a second from Ms. Jones. All were in favor, motion carried.

Agenda Items:

1. Prepare Dialogue and Presentation for Upcoming Public Hearing on June 20, 2018: The Board discussed how to properly collect public comment & question and answers, how to present the desired information, how to make is legible, what high points to elaborate on, and newly collected consumption data from April & May meter and well house readings.

With no further business to discuss the special meeting was adjourned at 2:05 PM following a motion from Ms. Edwards, seconded by Ms. Meyer. All were in favor motion carried.

Respectfully Submitted and Approved:

______________________________	______________________________
Jessie Roe	Richard Doney
Administrative/Treasurer	Chairman of the Board

Bayview Water & Sewer District
REGULAR MEETING MINUTES
20298 E Perimeter Rd, Bayview, ID 83803

June 20, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 3:00 PM and a roll call confirmed that Vice-Chair Sharon Meyer, directors Jan Jones, Robyn Edwards and Steve May were also present.

Others Present: District Operators Bob Kuchenski and Bob Hansen, District Treasurer Jessie Roe.

Guests Present: Ellery Howard and Gemma Puddy with JUB Engineers, Laura McAllon with McAloon Law, Katy Baker-Casile with Idaho Department of Environmental Quality (DEQ), as well as members of the public.

Consent Agenda and Minutes: Ms. Edwards motioned to approve the proposed agenda with a second from Ms. Meyer. All were in favor, motion carried. Ms. Jones motioned to approve the consent agenda: Approval of all financials reports for May 2018, May 17th & 30th, 2018 minutes, Authorization for Additional Services – Gemma Puddy w/ JUB, 2017 Annual Drinking Water Quality Report and approval to pay monthly bills as listed. This motion was seconded by Ms. Meyer and all were in favor, motion carried.

Public Hearing: Chairman Doney opened the public hearing at 3:07 PM. Ms. Puddy introduced herself to the public as a communications specialists and briefly explained the process and purpose of the public hearing which is to receive public feedback on how the Board should address deficiencies. She then handed to meeting over to Mr. Howard for further explanation and findings during his System Facility Plan: Non-revenue water (50% water loss due to leaking infrastructure), low water pressure complaints/inadequate fire flow, long term maintenance & reliability. Mr. Howard described possible solutions on how the District and the Board can address these problems, what improvements can be made, as well as the consequences of doing nothing about the deficiencies. The hearing was then opened up to a question and answer period and later the public comment period. The public hearing was closed at 5:09 PM following a motion from Ms. Edwards and seconded by Ms. Meyer. All were in favor, motion carried.

Chairman Doney then called for a short recess before resuming the regular Board meeting.
The regular board meeting was called back to order at 5:17 PM.

Reports:

Operator Report: Mr. Kuchenski reported on the District operations from May 17, 2018 through June 20, 2018 (attached).

Treasurer's Report: Ms. Roe presented the financial report for the month of June 2018 (attached).

Public Matters/Guests:

1. Chris Hansen – RE: Water line break at Bitter End Marina & Baywatch Estate Exemption Request: The Board reviewed the invoice previously submitted by Mr. Hansen for the Bitterend Marina water line break. Ms. Edwards directed staff to submit a claim to ICRMP for possible coverage. Next, the Board informed Mr. Hansen that the District's attorney has denied the ability to 'grandfather' the Baywatch Estates Development into the old rate structure prior to December 2017 on arbitrary, capricious per Idaho Statute Title 67 Chapter 52.

Old/Ongoing Business:

1. Operating Procedures Manual: Ms. Edwards reported the Board has now had three special meeting to edit the manual and it is well on its way. There is no expected completion date at this time.

New Business:

1. Unauthorized or Excessive ER Connections and How to Mediate: Ms. Edwards made a motion to seek proposals for GIS mapping for the sewer portion of the system to tie in with what JUB Engineers has already designed for the water system. Ms. Meyer seconded the motion, all were in favor, motion carried.
2. Linda Williams Claim Dismissal & Board Response: Chairman Doney announced that the claim against Bayview Water & Sewer District for unpaid vacation wages has been dropped/dismissed by Ms. Williams with prejudice; meaning she will not be able come back at a later time with charges.

Acknowledgement of Correspondence: None

Announcements: Next Public Hearing will be on July 26, 2018 at 6:00 PM held at the Bayview Community Center.

With no further business to discuss the regular meeting was adjourned at 5:47 PM following a motion from Mr. May, seconded by Ms. Jones. All were in favor, motion carried.

Respectfully Submitted and Approved:

Jessie Roe
Administrative/Treasurer

Richard Doney
Chairman of the Board

6/20/2018 Bayview Systems Report

A. Water Production update.

6,308,000 gallons produced by the wells during May. 3,264,000 gallons of consumption through customers meters This works out to 210,000 gallons per day produced by the wells of which 109,000 registered through customers meters. This is the equivalent of 230 gallons per day, per service connection. (474 service connections). Unaccounted for water lost is 3,044,000 gallons or 48% of production totals by the wells. The connections with the Navy are not metered. However, it is unlikely that the Navy is using 3 million gallons per month. These figures can be compared with the daily effluent flow figures below.

B. Sewer system production.

Due to the rainy weather and system repairs, starting up the Land Application has been delayed. We have determined that during May, 718,000 gallons of effluent has flowed into the drain field. This works out to 24,000 gallons of effluent pumped daily into our drain field daily. This is well under the drain field capacity of 96,000 gallons per day. Weather permitting, the Land Application should be started for the season by the June Board meeting.

C. General issues.

1. All meters were read in 1 day for the first time at the end of April and again at the end of May. This allowed us for the first time ever to compare consumption with the well production, less the Navy's unmetered use.

2. Sewer maintenance items for the past month include:
   a. Installing rain covers on manholes at the marinas in case of flooding. This prevents potential flood waters from entering the sewer system.
   b. 6 septic tank pumped since mid May. Due to potential flooding, 3 septic tanks at the Scenic Bay Marina, and one each at the Bitterend Marina and Hudson Bay Resort were pumped prior to flooding.
   c. Three of five sand filter beds are now operational in manual mode. A new control valve will be installed in sand filter bed #2.

3. 2017 Annual Water Quality Report is now available.

BAYVIEW WATER & SEWER DISTRICT

YR TO DATE 12/1/2017 THRU 6/30/2018

RESOURCES/EXPENSES

CASH BASIS - PRELIMINARY

	YTD 6/1/2018	June 2018	YTD 6/30/2018	BUDGET 17-18
RESOURCES:				
Certification Fees	$ 2,420.35	$ 1,678.73	$ 4,099.08	$ 3,500
Sewer Hookups	$ 160.00	$ 80.00	$ 240.00	$ 160
Water Hookups	$ -	$ 2,700.00	$ 2,700.00	$ 2,400
Misc. Income	$ 981.36	$ -	$ 981.36	$ -
Rent	$ 1,200.00	$ 200.00	$ 1,400.00	$ 2,400
W&S - User Fees	$ 171,216.72	$ 21,600.29	$ 192,817.01	$ 347,250
Reimbursement Grant	$ 19,665.00	$ 4,726.00	$ 24,391.00	$ 10,000
Interest Income	$ 458.16	$ 18.83	$ 476.99	$ -
TOTAL RESOURCES	$ 196,101.59	$ 31,003.85	$ 227,105.44	$ 365,710
EXPENSES:				
Sewer Maintenance	$ 15,923.85	$ 3,953.10	$ 19,876.95	$ 48,000
Water Maintenance	$ 20,552.07	$ 655.56	$ 21,207.63	$ 20,000
Vehicle Expense	$ 883.53	$ 581.87	$ 1,465.40	$ 2,000
Contract Labor	$ 10,611.90	$ -	$ 10,611.90	$ 10,000
Director Fees	$ 1,200.00	$ 250.00	$ 1,450.00	$ 3,000
Dues & Subscriptions	$ 1,007.97	$ 2.00	$ 1,009.97	$ 1,130
Office Supplies	$ 419.62	$ 27.55	$ 447.17	$ 2,100
System Operator	$ 42,000.00	$ 7,000.00	$ 49,000.00	$ 89,000
Training/Conferences	$ -	$ -	$ -	$ 1,000
Postage & Delivery	$ 1,041.16	$ 152.34	$ 1,193.50	$ 2,200
License & Permits	$ -	$ -	$ -	$ -
Misc. Expense	$ 6,789.73	$ -	$ 6,789.73	
Office Equipment	$ 777.07	$ -	$ 777.07	$ 3,500
Liability Insurance	$ 2,901.00	$ -	$ 2,901.00	$ 6,550
Workman's Comp	$ -	$ -	$ -	$ 2,000
Bank Fees	$ 199.12	$ 12.02	$ 211.14	$ -
Assessment Fees	$ 850.00	$ 425.00	$ 1,275.00	$ 1,700
Janitorial	$ 240.00	$ 40.00	$ 280.00	$ 480
Professional Fees	$ 54,411.62	$ 12,687.50	$ 67,099.12	$ 41,200
Telephone	$ 2,309.65	$ 134.96	$ 2,444.61	$ 2,840
Electric	$ 22,362.49	$ 3,323.46	$ 25,685.95	$ 43,872
Payroll Expenses	$ 14,228.11	$ 2,650.77	$ 16,878.88	$ 30,000
Capital Additions	$ -	$ -	$ -	$ 55,138
TOTAL EXPENSES	$ 198,708.89	$ 31,896.13	$ 230,605.02	$ 365,710
NET	$ (2,607.30)	$ (892.28)	$ (3,499.58)	
PLUS BEG BAL	$ 252,087.41	$ -	$ 532,613.81	
AVAIL RESOURCES	$ 249,480.11	$ (892.28)	$ 529,114.23	
TOTAL AVAILABLE CASH	$ 249,480.11		$ 544,203.71	
DEPOSITED IN:				
General O&M	#7564	$ 37,104.02		
Sewer Saving	#8307	$ 28,038.88		
Water Saving	#8299	$ 24,204.67		
LID Guarantee	#1227	$ 110,893.37		
LID Fund	#9680	$ 343,932.11		
TOTAL			**$ 544,173.05**	

Bayview Water & Sewer District

7825 N Meadowlark Way, Coeur d'Alene, ID 83815

SPECIAL MEETING MINUTES

June 26, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 2:30 PM and a roll call confirmed that directors Stephen May, Robyn Edwards, Sharon Meyer and Jan Jones were also present.

Others Present: District Treasurer Jessie Roe, Ellery Howard and Gemma Puddy with JUB Engineers.

Guests Present: Members of the Public.

Approval of Agenda: Ms. Edwards made a motion to approve the agenda with a second from Ms. Jones. All were in favor, motion carried.

Agenda Items:

1. Review of the first public hearing held on June 20, 2018 regarding needed system improvements: Mr. Howard reported that 35 people signed into the public hearing, four written comments were received and the following day he received an email. The Board reviewed all public comments as well as the email received and discussed how to answer all questions at the next meeting July 26, 2018 at 6:00 PM.

With no further business to discuss the special meeting was adjourned at 4:27 PM following a motion from Ms. Edwards, seconded by Ms. Meyer. All were in favor motion carried.

Respectfully Submitted and Approved:

Jessie Roe	Richard Doney
Administrative/Treasurer	Chairman of the Board

Bayview Water & Sewer District

7825 N Meadowlark Way, Coeur d'Alene, ID 83815

SPECIAL MEETING MINUTES

July 16, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 3:15 PM and a roll call confirmed that directors Stephen May, Robyn Edwards (via telephone), Sharon Meyer and Jan Jones were also present.

Others Present: District Treasurer Jessie Roe, as well as, Ellery Howard and Gemma Puddy with JUB Engineers.

Guests Present: Karen Renner, Norma Jean Knowles and Colleen Dahlseid.

Approval of Agenda: Ms. Jones made a motion to approve the agenda with a second from Ms. Meyer. All were in favor, motion carried.

Agenda Items:

1. Prepare dialogue and presentation for upcoming Public Hearing on July 26, 2018:
   The Board discussed pertinent points for opening commentary and meeting format, such as, tone and presentation style, how to present costs, necessary costs and being budget-friendly, how to address voting (who can vote). They also discussed how to expound the ramifications of not performing any of the suggested system repairs as well as the costs incurred by the current system deficiencies; how much of a reserve fund would need to be saved for emergency repairs? The Board decided to hold an open house two weeks following the public hearing so that customers had time to digest and think about the information cultured and could come back with their questions.

With no further business to discuss the special meeting was adjourned at 5.03 PM following a motion from Chairman Doney, seconded by Ms. Meyer. All were in favor motion carried.

Respectfully Submitted and Approved:

____________________________	____________________________
Jessie Roe	Richard Doney
Administrative/Treasurer	Chairman of the Board

Bayview Water & Sewer District
REGULAR MEETING MINUTES
20298 E Perimeter Rd, Bayview, ID 83803

August 16, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 7:00 PM and a roll call confirmed that Vice-Chair Sharon Meyer and directors Jan Jones and Steve May were also present.

Others Present: District Operator Bob Kuchenski.

Guests Present: Ellery Howard and Gemma Puddy with JUB Engineers and members of the public.

Consent Agenda and Minutes: Ms. Meyer motioned to approve the proposed agenda with a second from Mr. May. All were in favor, motion carried. Ms. Jones motioned to approve the consent agenda: Approval of all financials reports for July 2018, minutes for July 16th, 18th & 27th, 2018 meetings and approval to pay monthly bills as listed. This motion was seconded by Mr. May and all were in favor, motion carried.

Reports:

Treasurer's Report: In the absence of Ms. Roe, Ms. Jones presented the financial report for the month of July 2018 (attached).

Operator Report: Mr. Kuchenski reported on the District operations from July 19, 2018 through August 16, 2018 (attached).

Public Matters/Guests: NONE

Old/Ongoing Business:
1. JUB Update/Discussion: Chairman Doney announced that JUB Engineers was present and would be hosting an open house following the regular Board meeting.
2. Operating Procedures Manual: No new progress to report at this time.

New Business:
1. Website Design - Correspondence: Mr. May motioned to keep all correspondence to Bayview Water and Sewer District in house and to discontinue posting user correspondence on the District website, followed by a second from Ms. Meyer. All were in favor, motion carried.
2. Flyers – Mass Informational Mailing Regarding Bond Election and Project Details: The Board discussed whether or not to send out informational flyers to all residents or to have printouts available at the post office for people to pick up. Ms. Jones recommended the flyer go out with next month's regular user bill and to combine the costs for postage. Ms. Meyer made a motion to post information with September's bill regarding the project package(s) seconded by Ms. Jones. All were in favor, motion carried.
3. Water Rates: Commercial, Float Home, and Residential: Chairman Doney said it would be beneficial to have a water rate study done professionally. Katy with DEQ stood up and said they would highly recommend a rate study to ensure the District is able to sustain its system with current rates as well as any possible improvements to the system being looked at in the near future. Ms. Jones motioned to obtain bids for performing a rate study seconded by Ms. Meyer. All were in favor, motion carried.

Announcements: Chairman Doney announced Lyvel Road will be oiled next week. The oiling company is very busy but has the District scheduled. Lastly, there is a flyer that has been passed out to every home in Bayview; good bad or indifferent, this flyer did not come from the District or any of its Board members or employees.

With no further business to discuss the regular meeting was adjourned at 7:26 PM following a motion from Ms. Meyer, seconded by Ms. Jones. All were in favor, motion carried.

Respectfully Submitted and Approved:

Jessie Roe
Administrative/Treasurer

Richard Doney
Chairman of the Board

9/19/2018 Bayview Systems Report

A. Water Production update.

11,728,000 gallons produced by the wells during August. 7,633,000 gallons of consumption through customers meters This works out to 391,000 gallons per day produced by the wells of which 254,000 registered through customers meters. This is the equivalent of 534 gallons per day, per service connection. (476 service connections). Unaccounted for water lost is 4,095,000 gallons or 35% of production totals by the wells.

B. Water system items:

1. The soft start at Well #8 (backup well) burned up in an electrical event. We are currently anticipating approval of our insurance company claim to cover the approximately $20,000 cost of replacement.
2. Service line break on 5th Street last Friday.
3. Broken water meter set on 6th Street to be replaced prior to the Board meeting.

C. Sewer system production.

In July, 1,468,000 gallons of effluent has flowed into sewer treatment site with about 5% of this going to the drain field . This works out to 46,000 gallons of effluent pumped daily into our sewage treatment systems.

D. Sewer maintenance items.

1. Due to mechanical issues, we are presently using 2 of 5 sand filter beds and 5 or 7 sprinkler zones. Currently we are using about 14 to 18 gallons per day of 12.5% chlorine. We are on track to use over 500 gallons of chlorine per month. By comparison, the Cape Horn water system uses about 5 gallons of chlorine per month. We will be exploring self generating chlorine options for next year.
2. As mentioned, two of the five sand filter beds are fully operational in manual mode (beds 2 & 3). The actuator valves for beds 4 & 5 have failed and new actuators are required. Bed 1 does not have an actuator and cannot be used.
3.The Scenic Bay Marina only has one sewer pump as the other one was removed some time ago. We received a quote on a second sewer pump for $10,008.17. The price will likely increase to replace existing facilities for pump 1 that are rotting out with age. For our sewer system, this is our top priority which requires Board approval now to move forward.

BAYVIEW WATER & SEWER DISTRICT
YR TO DATE 12/1/2017 THRU 8/31/2018
RESOURCES/EXPENSES
CASH BASIS - PRELIMINARY

	YTD 8/1/2018	August 2018	YTD 8/31/2018	BUDGET 17-18
RESOURCES:				
Certification Fees	$ 5,216.19	$ -	$ 5,216.19	$ 3,500
Sewer Hookups	$ 1,520.00	$ -	$ 1,520.00	$ 160
Water Hookups	$ 7,480.00	$ 2,700.00	$ 10,180.00	$ 2,400
Misc. Income	$ 981.36	$ 6.13	$ 987.49	$ -
Rent	$ 1,600.00	$ 200.00	$ 1,800.00	$ 2,400
W&S - User Fees	$ 230,728.73	$ 34,412.76	$ 265,141.49	$ 347,250
Reimbursement Grant	$ 29,951.00	$ 2,374.00	$ 32,325.00	$ 10,000
Interest Income	$ 544.35	$ 117.77	$ 662.12	$ -
TOTAL RESOURCES	$ 278,021.63	$ 39,810.66	$ 317,832.29	$ 365,710
EXPENSES:				
Sewer Maintenance	$ 26,793.36	$ 10,849.49	$ 37,642.85	$ 48,000
Water Maintenance	$ 31,729.46	$ 162.06	$ 31,891.52	$ 20,000
Vehicle Expense	$ 3,532.53	$ 111.19	$ 3,643.72	$ 2,000
Contract Labor	$ 10,611.90	$ -	$ 10,611.90	$ 10,000
Director Fees	$ 1,700.00	$ 150.00	$ 1,850.00	$ 3,000
Dues & Subscriptions	$ 1,011.97	$ 422.00	$ 1,433.97	$ 1,130
Office Supplies	$ 477.84	$ 130.95	$ 608.79	$ 2,100
System Operator	$ 56,000.00	$ 7,000.00	$ 63,000.00	$ 89,000
Training/Conferences	$ -	$ 215.00	$ 215.00	$ 1,000
Postage & Delivery	$ 1,193.50	$ 342.25	$ 1,535.75	$ 2,200
Printing & Production	$ 58.69	$ 64.69	$ 123.38	$ -
Misc. Expense	$ 7,024.72	$ 45.00	$ 7,069.72	
Office Equipment	$ 901.85	$ 72.00	$ 973.85	$ 3,500
Liability Insurance	$ 2,901.00	$ -	$ 2,901.00	$ 6,550
Workman's Comp	$ -	$ -	$ -	$ 2,000
Bank Fees	$ 223.16	$ 12.02	$ 235.18	$ -
Assessment Fees	$ 1,275.00	$ -	$ 1,275.00	$ 1,700
Janitorial	$ 320.00	$ -	$ 320.00	$ 480
Professional Fees	$ 73,901.35	$ 8,417.37	$ 82,318.72	$ 41,200
Telephone	$ 3,144.95	$ 134.96	$ 3,279.91	$ 2,840
Electric	$ 29,378.94	$ 4,495.31	$ 33,874.25	$ 43,872
Payroll Expenses	$ 19,562.38	$ 2,802.13	$ 22,364.51	$ 30,000
Capital Additions	$ -	$ -	$ -	$ 55,138
TOTAL EXPENSES	$ 271,742.60	$ 35,426.42	$ 307,169.02	$ 365,710
NET	$ 6,279.03	$ 4,384.24	$ 10,663.27	
PLUS BEG BAL	$ 252,087.41	$ -	$ 532,613.81	
AVAIL RESOURCES	$ 258,366.44	$ 4,384.24	$ 543,277.08	
TOTAL AVAILABLE CASH	$ 258,366.44		$ 560,901.99	

DEPOSITED IN:

General O&M	#7564	$ 52,698.43	
Sewer Saving	#8307	$ 28,043.77	
Water Saving	#8299	$ 24,208.90	
LID Guarantee	#1227	$ 110,922.06	
LID Fund	#9680	$ 346,614.81	
TOTAL			**$ 562,487.97**

Bayview Water & Sewer District

20298 E. Perimeter Rd, Bayview, ID 83803

SPECIAL MEETING MINUTES

August 23, 2018

Call to Order and Roll Call: Chairman Richard Doney opened the meeting at 9:35 AM and a roll call confirmed that directors Stephen May, Sharon Meyer, Jan Jones, and Robyn Edwards (via Skype) were also present.

Others Present: District Treasurer Jessie Roe, District Operator Bob Kuchenski, Ellery Howard & Gemma Puddy with JUB Engineers and Laura McAloon with McAloon Law.

Guests Present: Members of the Public.

Approval of Agenda: Chairman Doney made a motion to approve the agenda with a second from Mr. May. All were in favor, motion carried.

Agenda Items:

1.) Discuss project packages and start to develop a resolution for the system deficiency improvement bond:

After the Board reviewed the results of the poll from the most recent public hearing Ms. Edwards made a motion that the Board of Directors for the Bayview Water and Sewer District, declare their intention to call for a BOND ELECTION at the most proximate legal date in November of the present year and further that they direct their Bond Counsel to prepare an Ordinance as well as such other documents as required for their timely adoption whereby they may obtain approval from their Electors to incur indebtedness for the purpose of making necessary repairs and improvements to the water system. The amount of funds for which to seek approval shall be those required to pursue what has been called Project A and for which the Engineer's estimate indicates that as much as two million one hundred and fifty thousand dollars ($2,150,000.00) may be required. Ms. Edwards further moved that they request their Bond Counsel to prepare an alternative that, if adopted, would provide for inclusion of water meter replacement as an addition to Project A for which the Engineer's estimate indicates as much as five hundred thousand dollars ($500,000) may be required. Ms. Edwards subsequently moved to amend the motion to replace "ordinance" with "resolution". This motion was seconded by Ms. Meyer. All were in favor, motion carried.

The Board set the next meeting to adopt said resolution for September 5, 2018 at 2:00 PM to be held at the Bayview Community Center.

With no further business to discuss the special meeting was adjourned at 11:21 AM following a motion from Ms. Meyer, seconded by Ms. Jones. All were in favor, motion carried.

Respectfully Submitted and Approved:

____________________________	____________________________
Jessie Roe	Richard Doney
Administrative/Treasurer	Chairman of the Board

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Open House 1 – 5/17/2018

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Farragut Reservoir

- 225,000 gallons (concrete)
- Built in 1942 (76 years old)
- Remaining life 25-30 years (with repairs)
- Interior and exterior coatings have failed
- Numerous cracks are allowing leakage

Dromore Reservoir

- 11,000 gallons (welded steel)
- Built in 1970s
- Undersized and without adequate fire flow storage
- Low elevation contributes to low pressure areas

Existing System Deficiencies:

Non-Revenue Water

- Excessive amount of water that is not metered (at least 50% of water)
  - Potential Contributors:
    - Leaking transmission lines in Farragut Area.
    - Navy Base is unmetered and use is unknown.
    - Aging meters in Bayview Area are inaccurate (read less than actual use).
    - Known leaks in distribution lines.

Low Water Pressure Complaints/Inadequate Fire Flow

- Bayview Area – along the top of the lower pressure zone.
- North Side of Bayview.
- Dromore Area – low pressure and reservoir is undersized (11K gal).

Long-Term Maintenance/Reliability

- Aging infrastructure
  - Major components installed early 1940s, mid 1970s
- Auto back-up power needed at Well 7.
- SCADA has some deficiencies, no back-up power at tank site/repeater.


N

Hearing 1 – 6/20/2018

THIS PAGE WAS INTENTIONALLY LEFT BLANK

AFFIDAVIT OF PUBLICATION

STATE OF IDAHO,
County of Kootenai, } SS.

Geri Hagler being first duly sworn upon oath deposes and says:

1. I am now and at all times hereinafter mentioned was a citizen of the United States, resident of the State of Idaho, over the age of twenty-one years and not a party of the above entitled action.

2. I am now and at all times hereinafter mentioned was the printer (principal clerk) of the "Coeur d'Alene Press," a newspaper printed and published daily except Sunday in Coeur d'Alene, Kootenai County, Idaho, and having a general circulation in said county.

3. The legal notice

of which the annexed is a printed copy, was published in the regular Wednesday issue of said newspaper for 1 ~~consecutive~~ day commencing on the 13 day of June 2018, and ending on the 13 day of June 2018, and such publication was made as often during said period as said daily newspaper was regularly issued.

4. That said newspaper has been continuously and uninterruptedly published in said Kootenai County, during a period of more than seventy-eight consecutive weeks immediately prior to the first publication of said notice Geri Hagler

On this 13 day of June in the year of 2018, before me, a Notary Public, personally appeared Geri Hagler, known or identified to me to be the person whose name subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledged to me that he executed the same.

Katrina George
Notary Public for the State of Idaho,
residing at Coeur d'Alene, Idaho.

KATRINA GEORGE
NOTARY PUBLIC
STATE OF IDAHO

MY COMMISSION EXPIRES 8/29/23

Notice of Public Hearing of the Bayview Water & Sewer District For Needed System Improvements & Repairs

The Board of Directors of the Bayview Water & Sewer District have set a public hearing and will receive citizen input and discuss the proposed water system improvements to be funded by a State Revolving Fund (SRF) loan. Discussion will include the need for the project, alternatives evaluated, the rationale for the selected alternative and the environmental and financial impacts of the selected alternatives. Comments from the general public will be received at this time. The hearing will be on Wednesday, June 20, 2018 at 3:00 PM at the Bayview Community Center. Interested residents of the District are encouraged to attend.
CDA LEGAL 9645
AD#197541
JUNE 7, 13, 2018

Bayview
Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
JUNE 20, 2018, 3 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)	Do you wish to give public comment?
Sheryl Puckett	☑Yes ☐No ☐Unsure	16023 E Schaeffer	Sherylpp@gmail	☒Written ☐ Spoken ☐ No
SK/(WILKUSH)	☐Yes ☐No ☐Unsure	154 OSPREY VIEW	208-683-3625	☐Written ☐ Spoken ☑No
Tom Bomgarner	☒Yes ☐No ☐Unsure	103 OSPREY VIEW	208 683 0390	☐Written ☐ Spoken ☒No
Kate + Jim Pone	☒Yes ☐No ☐Unsure	34416 N. Raven Place	5j28jpj@q.com	☐Written ☐ Spoken ☒No
Laurie Mauser	☐Yes ☐No ☐Unsure	17474 E. Cape Horn Rd. Bayview	mauserlaurie@roadrunner.com	☐Written ☐ Spoken ☐ No
Judi WHITE	☒Yes ☐No ☐Unsure	16800 Almas Ct. Bayview	NTONTHEROAD@HOTMAIL.COM	☐Written ☐ Spoken ☒No
Colleen Dahlseid	☑Yes ☐No ☐Unsure	17532 E. Bannock - Bayview	missionlydoc@gmail.com	☐Written ☐ Spoken ☐ No
Roger Dahlseid	☑Yes ☐No ☐Unsure	" " "	" "	☐Written ☐ Spoken ☐ No
Julian Ferguson	☑Yes ☐No ☐Unsure	34439 Bluebird Ln Bayview	208.683-6904	☐Written ☐ Spoken ☐ No
Connie Johnson	☒Yes ☐No ☐Unsure	33704 N Spruce Ave Bayview	hazelman.connie@gmail.com	☐Written ☐ Spoken ☒No
Jan Almeida	☑Yes ☐No ☐Unsure	17274 E. Home Sixty Bayview	208-561-5094	☐Written ☒Spoken ☐ No
3 [illegible] Ali Spahn	☑Yes ☐No ☐Unsure	33915 N. FIR AVE. BAYVIEW	alispahn@yahoo.com	☐Written ☐ Spoken ☐ No
total signed in: 35	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No

Bayview Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
JUNE 20, 2018, 3 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)	Do you wish to give public comment?
Tim + Linda Sibler	☑Yes ☐No ☐Unsure	P.O. BOX 301 BAYVIEW, ID 83803	208-561-5110 tnlsigler@hotmail.com	☐Written ☐ Spoken ☑No
Dale Wilson	☑Yes ☐No ☐Unsure	12455 Arapaho Rd.	208 561-5096 edmom77@msn.com	☐Written ☐ Spoken ☑No
Norma J. Knowles	☑Yes ☐No ☐Unsure	34417 N. Robin LN. (PO 422) Bayview 83803	208-683-1980	☐Written ☐ Spoken ☑No
Cindy Hansen	☑Yes ☐No ☐Unsure	PO Box 595 Bayview ID 83803	208-683-2995	☐Written ☐ Spoken ☑No
Sue Damon	☐Yes ☑No ☐Unsure	PO Box 535 Bayview Id. 83803	208 683-8608	☐Written ☐ Spoken ☑No
Steven Botti-Smith	☑Yes ☒No ☐Unsure	PO Bx 391 BayView ID 83803	208 683-3679	☐Written ☐ Spoken ☑No
Kent & Marilyn Saunders	☑Yes ☐No ☐Unsure	17838 E. Chopunnish Dr. PoBox 297 Bayview 83803	saundersk@earthlink.net	☐Written ☐ Spoken ☑No
Debra Deimler	☐Yes ☐No ☒Unsure	34560 N. Lynel Bayview, Id	208-691-7087	☐Written ☐ Spoken ☐ No
Jim Pearson	☐Yes ☐No ☒Unsure	same	same	☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No

Bayview
Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
JUNE 20, 2018, 3 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)	Do you wish to give public comment?
Chris Hansen	Yes No Unsure	P.O. Box 595 Bayview 83803	208-683-2995	Written Spoken No
Nelda Simpson	Yes No Unsure	17587 E. Bannock Dr.		Written Spoken No
Bob & Marilyn Weaver	Yes No Unsure	N. 34748 Limekiln Rd. Bayview		Written Spoken No
John & [illegible] [illegible]	Yes No Unsure	383 Cape Horn Rd. 83803		Written Spoken No
Jonathan T Daniells	Yes No Unsure	34546 N. Lyvel Ave 83803		Written Spoken No
BRICKNER/GRUBBS	Yes No Unsure	19602 E. CAPE HORN RD		Written Spoken No
[illegible] LWA	Yes No Unsure	34160 N. SPRUCE ST	208 561-5837	Written Spoken No
Laura McAloon	Yes No Unsure	Bond Counsel		Written Spoken No
DAVE HAMILTON	Yes No Unsure	PO Box 12 BAYVIEW		Written Spoken No
	Yes No Unsure			Written Spoken No
	Yes No Unsure			Written Spoken No
	Yes No Unsure			Written Spoken No
	Yes No Unsure			Written Spoken No
	Yes No Unsure			Written Spoken No
	Yes No Unsure			Written Spoken No

Bayview Water & Sewer District

PUBLIC HEARING:

Water System Facility Plan

Wednesday, June 20, 2018

Bayview Water & Sewer District

Agenda

- **Presentation**
- **Questions & Answers**
- **Public Comments**
  - Sign up
  - Three minutes per person

Today's Goal: Receive public feedback on how the Board should address deficiencies.

Bayview Water & Sewer District

Timeline

- **November 2017 –** J-U-B hired to complete water system facility plan with $24,500 of DEQ grant funding.
- **January 2018 –** Submittal of LOI to DEQ for potential water system construction loan.
- **January-April 2018 –** Public survey (online and manual).
- **February 2018 –** J-U-B secured an additional $20,500 grant for the facility plan.
- **April 4, 10, 24, May 2, and June 12, 2018 –** Public workshops to discuss water system planning.

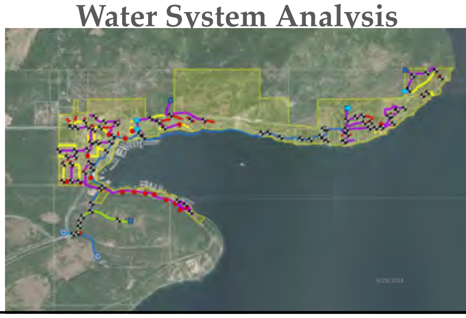
Bayview Water & Sewer District

Timeline

- **May 2018 –** DEQ approved construction loan request (30 years, 1.75% interest, approx. $215,000 principal forgiveness).
- **May 17, 2018 –** Public open house
- **June 20, 2018 –** Public hearing 1
- **Late July 2018 –** Public hearing 2
- **Early fall 2018 –** Water system facility plan complete.
- **November 6, 2018 –** Potential revenue bond election to approve financing of water system improvements.

Bayview Water & Sewer District

Water System Analysis



Bayview Water & Sewer District

Existing System Deficiencies

1. **Non-Revenue Water**
2. **Low Water Pressure Complaints/ Inadequate Fire Flow**
3. **Long-Term Maintenance/Reliability**

Bayview Water & Sewer District

1 Non-Revenue Water

- Excessive amount of water that is not metered (at least 50% of water).
  - Potential Contributors:
    - Leaking transmission lines in Farragut Area.
    - Navy Base is unmetered and use is unknown.
    - Aging meters in Bayview Area are inaccurate (read less than actual use).
    - Known leaks in distribution lines.

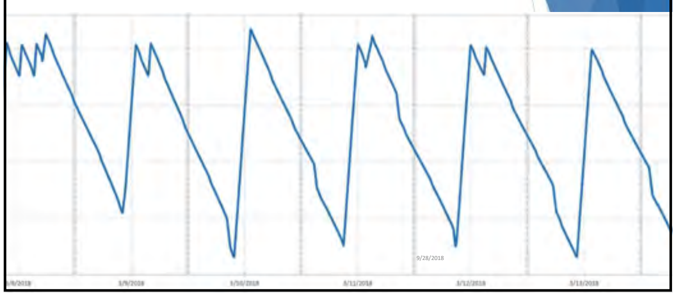
Bayview Water & Sewer District

Pipes

- Leaking pipe joints in the Farragut area.

Bayview Water & Sewer District

Tank Levels



Bayview Water & Sewer District

2 Low Water Pressure Complaints/ Inadequate Fire Flow

- Bayview Area – along the top of the lower pressure zone.
- North Side of Bayview.
- Dromore Area – low pressure and reservoir is undersized (only 11K gallons) and does not provide adequate fire flow.

Bayview Water & Sewer District

Dromore Reservoir

- 11,000 gallons (welded steel).
- Built in 1970s.
- Undersized and without adequate fire flow storage.
- Low elevation contributes to low pressure areas.

Bayview Water & Sewer District

3 Long-Term Maintenance/Reliability

- Aging infrastructure:
  - Major components installed early 1940s, mid 1970s.
- Auto back-up power needed at Well 7.
- SCADA (controls) is outdated and has some deficiencies.
- No back-up power at Farragut Reservoir.

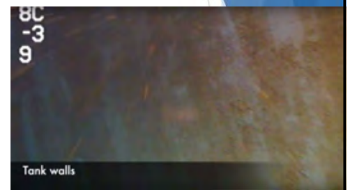
Bayview Water & Sewer District

Farragut Reservoir

- 225,000 gallons (concrete).
- Built in 1942 (76 years old).
- Remaining life 25-30 years (with repairs).
- Interior and exterior coatings have failed.
- Numerous cracks are allowing leakage.

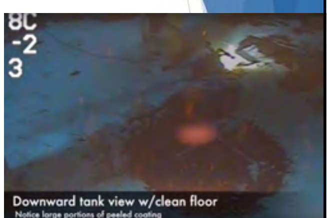
Bayview Water & Sewer District

Farragut Reservoir: Inside the tank



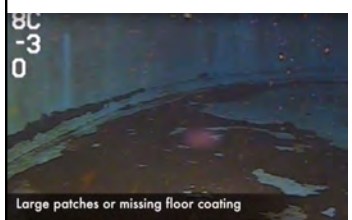
Bayview Water & Sewer District

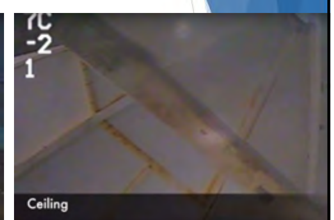
Farragut Reservoir: Inside the tank



Bayview Water & Sewer District

Farragut Reservoir: Inside the tank





Bayview Water & Sewer District

How Do We Address These Deficiencies?

Today's Goal: Receive public feedback on how the Board should address deficiencies.

Bayview Water & Sewer District

System Needs

- Meter replacement
  - Replace old and inaccurate meters.
  - Add meters to unmetered locations.
- Minor projects
  - Repair known leaks, SCADA upgrades, generator at Well 7, and PRV rebuilds.
- Repair or replace the leaky transmission mains in Farragut area.

Bayview Water & Sewer District

System Storage Needs

- **Construct new tank to serve all BWSD.**
  - Life of 75-100 years.
  - Requires new transmission main.
  - Addresses low water pressure issues.
  - Increases water system efficiency and fire flow.
- **Rehab Farragut and replace Dromore tanks.**
  - Life of 25-30 years.
  - Requires replacement of existing transmission main.

9/28/2018

Bayview Water & Sewer District

Why Make Improvements Now?

- Aging infrastructure is approaching end of usable life.
  - Major system components were constructed in the 1940s.
- Current DEQ loan terms are favorable.
  - 1.75% interest over 30-year period.
  - Approx. $215,000 principal forgiveness.
- Future users will share the costs of improvements.

9/28/2018

Bayview Water & Sewer District

What if We Do Nothing?

- Continue to waste approximately 50% of pumped water (approx. 50 million gallons per year).
- Need to establish a repair fund.
- Would have to address any repairs immediately without the benefit of very favorable financing terms.
- Current customers would have to pay for system repairs upfront vs. having future users share costs.

9/28/2018

Bayview Water & Sewer District

Questions & Answers (approx. 30 minutes)

- Relating to the presentation.
- Ellery Howard – J-U-B
- Katy Baker-Casille – DEQ
- Laura McAloon – Bond Counsel

9/28/2018

Bayview Water & Sewer District

Public Comment

- For those who signed up to comment.
- Presentation-related comments.
- Three minutes per person.
- Please state your name and address before commenting.

9/28/2018

Bayview Water & Sewer District

9/28/2018

Bayview
Water & Sewer District

PUBLIC HEARING: COMMENTS - WATER SYSTEM
JUNE 20, 2018, 3 P.M.

Name and Contact Information: Norma Jean Knowles
208-683-1980 Njyesca6@gmail.com

Comments:
I am deeply concerned about the costs that 471 users are going to share ~~about~~ with the discussed "improvements" that we are being told has to be done.
I would ~~sta~~ prefer that we replace meters as needed instead of mass replacement. I also prefer that we do the necessary repairs as needed instead of incurring massive costs.

Do not want to speak

Bayview
Water & Sewer District

PUBLIC HEARING: COMMENTS - WATER SYSTEM

JUNE 20, 2018, 3 P.M.

Name and Contact Information: Kate Jones
mkatej@q.com

Comments:

5 public workshops ?! how are they communicated? We received an e-mail about this one, but none of the others. We are seasonal residents who have a stake in this, but no vote. We do like to attend the meetings when possible.
Please send an e-mail about the next public meeting in July.
Thank-you

P.S. Can you prioritize the projects in terms of need (not money). Like, if you only do 1 thing this should be it... ~~etc~~ and on down the line?

Bayview Water & Sewer District

PUBLIC HEARING: COMMENTS - WATER SYSTEM

JUNE 20, 2018, 3 P.M.

Name and Contact Information: Connie Johnson
360 359-1185

Comments:

Are there any federal funding programs/grants for helping this particular water system problem? (Federal laws on water leaking - what are they?)

Does replacing the Farragut tank take care of the problems of Bromore tank? Would both tanks be replaced (if replacement is the decision)?

Bayview Water & Sewer District

PUBLIC HEARING: COMMENTS - WATER SYSTEM

JUNE 20, 2018, 3 P.M.

Name and Contact Information: Deb Deimler
208-691-7087

Comments: I need to talk to
someone in Charge of
Billing - I am often Getting
overcharged by Jessie

www.BayviewWaterandSewerDistrict.com

Bayview
Water & Sewer District

PUBLIC HEARING: COMMENTS - WATER SYSTEM
JUNE 20, 2018, 3 P.M.

Name and Contact Information: Tom Bumgarner
208 683 0390

Comments:
In my opinion this meet was backwhrds.
I cannot give you input when you have not given me data upon which I can make a decision of support.
For example. Rehab the existing reservoir vs. new construction. My answer changes if rehab is 80% of new const. or is it 20%.

Don't fail to bring the $. again.
I did this kind of thing for 25 years. And this was backwards.
Thank you

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Hearing 2 – 7/26/2018

THIS PAGE WAS INTENTIONALLY LEFT BLANK

AFFIDAVIT OF PUBLICATION

STATE OF IDAHO,
County of Kootenai, } SS.

Geri Hagler being first duly sworn upon oath deposes and says:

1. I am now and at all times hereinafter mentioned was a citizen of the United States, resident of the State of Idaho, over the age of twenty-one years and not a party of the above entitled action.

2. I am now and at all times hereinafter mentioned was the printer (principal clerk) of the "Coeur d'Alene Press," a newspaper printed and published daily except Sunday in Coeur d'Alene, Kootenai County, Idaho, and having a general circulation in said county.

3. The legal notice

of which the annexed is a printed copy, was published in the regular Thursday issue of said newspaper for 2 consecutive weeks commencing on the 12 day of July 2018, and ending on the 19 day of July, 20 18, and such publication was made as often during said period as said daily newspaper was regularly issued.

4. That said newspaper has been continuously and uninterruptedly published in said Kootenai County, during a period of more than seventy-eight consecutive weeks immediately prior to the first publication of said notice Geri Hagler

On this 19 day of July in the year of 2018, before me, a Notary Public, personally appeared Geri Hagler, known or identified to me to be the person whose name subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledged to me that he executed the same.

Katrina George
Notary Public for the State of Idaho,
residing at Coeur d'Alene, Idaho.

KATRINA GEORGE NOTARY PUBLIC STATE OF IDAHO

MY COMMISSION EXPIRES 8/29/23

Notice of Public Hearing of the Bayview Water & Sewer District For Needed System Improvements & Repairs

The Board of Directors of the Bayview Water & Sewer District have set a public hearing and will receive citizen input and discuss the proposed water system improvements to be funded by a State Revolving Fund (SRF) loan. Discussion will include the need for the project, alternatives evaluated, the rationale for the selected alternative and the environmental and financial impacts of the selected alternatives. Comments from the general public will be received at this time. The hearing will be on Thursday, July 26, 2018 at 6:00 PM at the Bayview Community Center. Interested residents of the District are encouraged to attend.
CDA LEGAL 9811
AD#208183
JULY 12, 19, 2018

Bayview Water & Sewer District

14
12
17
43 Attendees (some did not sign in)

PUBLIC HEARING: ATTENDANCE SIGN-IN

JULY 26, 2018, 6 P.M.

12

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)	Do you wish to give public comment?
Sue Damon	□Yes ☒No □Unsure	33556 N. MACDONALDS BAYVIEW ID 83803	nomadskm@aol.com	□Written □ Spoken ☒No
Bruce+Judy Robinson	☒Yes □No □Unsure	16057 E 4th St Bayview ID 83803	208-683-3588	□Written □ Spoken ☒No
Robert+Velda Simpson	☒Yes □No □Unsure	17587 E. Bannock Dr. Bayview, ID. 83803	208-561-5155	□Written ☒Spoken □ No
Randy+MaryAnn Henderson	☒Yes □No □Unsure	33679 N. Fir 83803	maryannrandy@hotmail.com	□Written □ Spoken ☒No
Ken Billing	☒Yes □No □Unsure	11 Cape Horn Dr. Bayview, ID 83803	kbilling@twc.com	□Written □ Spoken ☒No
Norman Bishop	□Yes □No ☒Unsure	34160 N. Spruce, Bayview, ID 83803	nabishop12@gmail.com	□Written □ Spoken ☒No
Robert Prince	☒Yes □No □Unsure	34175 N. Pend Oreille Pines 83803		□Written □ Spoken ☒No
James Jones	☒Yes □No □Unsure	34416 N Raven Place 83803	sj28jpj@g.com	□Written □ Spoken ☒No
Jim Wilkuski	☒Yes □No □Unsure	154 Osprey View Ln	208,683,3625	□Written □ Spoken □ No
	□Yes □No □Unsure			□Written □ Spoken □ No
	□Yes □No □Unsure			□Written □ Spoken □ No
	□Yes □No □Unsure			□Written □ Spoken □ No
	□Yes □No □Unsure			□Written □ Spoken □ No
	□Yes □No □Unsure			□Written □ Spoken □ No
	□Yes □No □Unsure			□Written □ Spoken □ No

Bayview
Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
JULY 26, 2018, 6 P.M.

17

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)	Do you wish to give public comment?
Maureen + Bill Carl	☒Yes ☐No ☐Unsure	33707 N. Fir Ave, Bayview ID 83803	mandbcarl@icloud.com	☐Written ☒Spoken ☐ No
Don Thraillkill Marva Jensen	☒Yes ☐No ☐Unsure	34239 N. Hollyhock		☐Written ☐ Spoken ☐ No
Dorothy Johnson	☒Yes ☐No ☐Unsure	34230 N Bardill St Bayview I 83803		☐Written ☐ Spoken ☐ No
John + DiAnn Kohler	☐Yes ☐No ☐Unsure	382 Cape Horn Dr.		☐Written ☐ Spoken ☒No
Alyssa McWilliams	☒Yes ☐No ☐Unsure	16032 E. Schaffer St Bayview 83803		☐Written ☐ Spoken ☒ No
Bob Fisher	☒Yes ☐No ☐Unsure	17156 Cape Horn		☐Written ☐ Spoken ☒No
Ray Newcombe	☒Yes ☐No ☐Unsure	33793 Stubs St.		☐Written ☐ Spoken ☐ No
Sally Newcombe	☒Yes ☐No ☐Unsure	33793 Stubs ST Bayview ID		☐Written ☐ Spoken ☐ No
Bruce Powell	☒Yes ☐No ☐Unsure	33474 Cherokee		☐Written ☒Spoken ☐ No
Greg Hansen	☒Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No
Jim + Kate Jones	☒Yes ☐No ☐Unsure	34416 N Raven Pl	MKATEJ@Q.com	☐Written ☐ Spoken ☒No
Dale Wilson	☒Yes ☐No ☐Unsure	17435 Arapaho		☐Written ☐ Spoken ☒No
Gary MacDonald	☐Yes ☐No ☐Unsure	17813 E. Hudson Bay Rd, Bayview		☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No

14

Bayview Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
JULY 26, 2018, 6 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)	Do you wish to give public comment?
Sheryl Puckett	☑Yes ☐No ☐Unsure	16023 E. Schaeffer	Sherylpp@gmail.com	☐Written ☐ Spoken ☐ No
Curtis Gillespie	☐Yes ☐No ☑Unsure	16646 Cape Horn Rd	curtisgillespie@msn.com	☐Written ☐ Spoken ☒No
Beth Gillespie	☐Yes ☐No ☑Unsure	16646 Cape Horn Rd	canoe_cg@yahoo.com	☐Written ☐ Spoken ☒No
Ken & Marilyn Saunders	☒Yes ☐No ☐Unsure	17838 E. Chopunnish Dr	saundersk@earthlink.net	☐Written ☐ Spoken ☒No
Karen Renner	☐Yes ☐No ☐Unsure	34084 E Scenic Bay		☐Written ☐ Spoken ☒No
Reid O'Connor	☐Yes ☐No ☐Unsure	33770 Spruce		☐Written ☐ Spoken ☒No
Kea Fisher	☑Yes ☐No ☐Unsure	17156 E Cape Horn Rd	twofishys@hotmail.com	☐Written ☐ Spoken ☒No
Colleen Dahlseid	☑Yes ☐No ☐Unsure	17532 E. Bannock Dr.	missionulydoc@gmail.com	☐Written ☒Spoken ☐ No
Beverly Galley	☐Yes ☐No ☐Unsure	16304 E 4th St		☐Written ☐ Spoken ☒No
Jim Lamire	☐Yes ☐No ☐Unsure	456 Cape Horn Drive		☐Written ☐ Spoken ☒No
Pat Flynn	☒Yes ☐No ☐Unsure	A-14 Scenic Bay Resort		☐Written ☐ Spoken ☐ No
Sam Silva	☒Yes ☐No ☐Unsure	17425 Arapaho Rd.	SamueSilva@msn.com	☐Written ☐ Spoken ☒No
Powell Shoemaker	☐Yes ☐No ☐Unsure	17008 JD's "E" Dock		☐Written ☐ Spoken ☒No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No
	☐Yes ☐No ☐Unsure			☐Written ☐ Spoken ☐ No

Bayview Water & Sewer District

PUBLIC HEARING:

Water System Facility Plan

Thursday, July 26, 2018

Bayview Water & Sewer District

Agenda

- **Presentation**
- **Questions & Answers**
- **Pass out Handouts**
- **Public Comments**
  - Written Comment

Today's Goal: Present estimated costs for various projects and answer any questions.

Bayview Water & Sewer District

Timeline

- **April 4, 10, 24, May 2, June 12, and July 16, 2018** Public workshops to discuss water system planning.
- **May 17 –** Public Open House 1
- **June 20 –** Public Hearing 1
  - Present System Deficiencies
- **Today - July 26 –** Public Hearing 2
  - Present Estimated Project Costs
- **August 16 –** Open House 2
- **November 6, 2018 –** Potential revenue bond election to approve financing of water system improvements.

Bayview Water & Sewer District

Water System Analysis

Bayview Water & Sewer District

Existing System Deficiencies

1. **Non-Revenue Water**
2. **Low Water Pressure Complaints/ Inadequate Fire Flow**
3. **Long-Term Maintenance/Reliability**

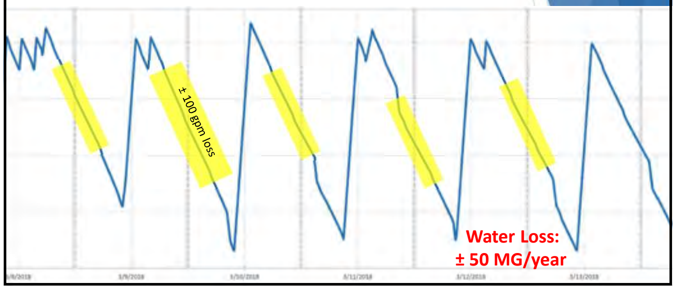
Bayview Water & Sewer District

1 Non-Revenue Water

- Excessive amount of water that is not metered (at least 50% of water).
  - Potential Contributors:
    - Leaking transmission lines in Farragut Area.
    - Navy Base is unmetered and use is unknown.
    - Aging meters in Bayview Area are inaccurate (read less than actual use).
    - Known leaks in distribution lines.

Bayview Water & Sewer District

Tank Levels



Bayview Water & Sewer District

2 Low Water Pressure Complaints/ Inadequate Fire Flow

- Bayview Area – along the top of the lower pressure zone.
- North Side of Bayview.
- Dromore Area – low pressure and reservoir is undersized (only 11K gallons) and does not provide adequate fire flow.

Bayview Water & Sewer District

Dromore Reservoir

- 11,000 gallons (welded steel).
- Built in 1970s.
- Undersized and without adequate fire flow storage.
- Low elevation contributes to low pressure areas.

Bayview Water & Sewer District

3 Long-Term Maintenance/Reliability

- Aging infrastructure:
  - Major components installed early 1940s, mid 1970s.
- Auto back-up power needed at Well 7.
- SCADA (controls) is outdated and has some deficiencies.
- No back-up power at Farragut Reservoir.

Bayview Water & Sewer District

Farragut Reservoir

- 225,000 gallons (concrete).
- Built in 1942 (76 years old).
- Remaining life 25-30 years (with repairs).
- Interior and exterior coatings have failed.
- Numerous cracks are allowing leakage.

Bayview Water & Sewer District

How much will it cost to address these deficiencies?

Today's Goal: Present estimated costs for various projects and answer any questions.

Bayview Water & Sewer District

Balancing Critical System Needs vs. Affordability

- Aging storage facilities
  - Repair or replace storage reservoirs in Bayview area.
- Significant leakage in aging transmission mains
  - Repair or replace mains in Farragut area.
- Consider other needs as maintenance or separate projects.
  - Meter replacement.

Bayview Water & Sewer District

System Storage Needs

- **Construct new tank to serve all BWSD.**
  - Life of 75-100 years.
  - Requires new transmission main.
  - Addresses low water pressure issues.
  - Increases water system efficiency and fire flow.
- **Rehab Farragut and replace Dromore tanks.**
  - Life of 25-30 years (rehab).
  - Requires replacement of existing transmission main.

Bayview Water & Sewer District

Estimated Costs for Potential Project Packages

J-U-B ENGINEERS, INC.

Bayview Water & Sewer District

Projects Summary

Comparison Matrix

Potential Rate Increase Implementation

- soonest would be 1-2 years
- could be phased in over several years

Bayview Water & Sewer District

Questions & Answers

- Ellery Howard – J-U-B
- Katy Baker-Casile – DEQ
- Laura McAloon – Bond Counsel (unavailable, will be here August 16)

- Written comment sheets are available at this time.
- Additional comments will be taken at the Open House on August 16, 2018.

- Don't forget to get a copy of the handout (will also be available on the BWSD Website).

Bayview Water & Sewer District

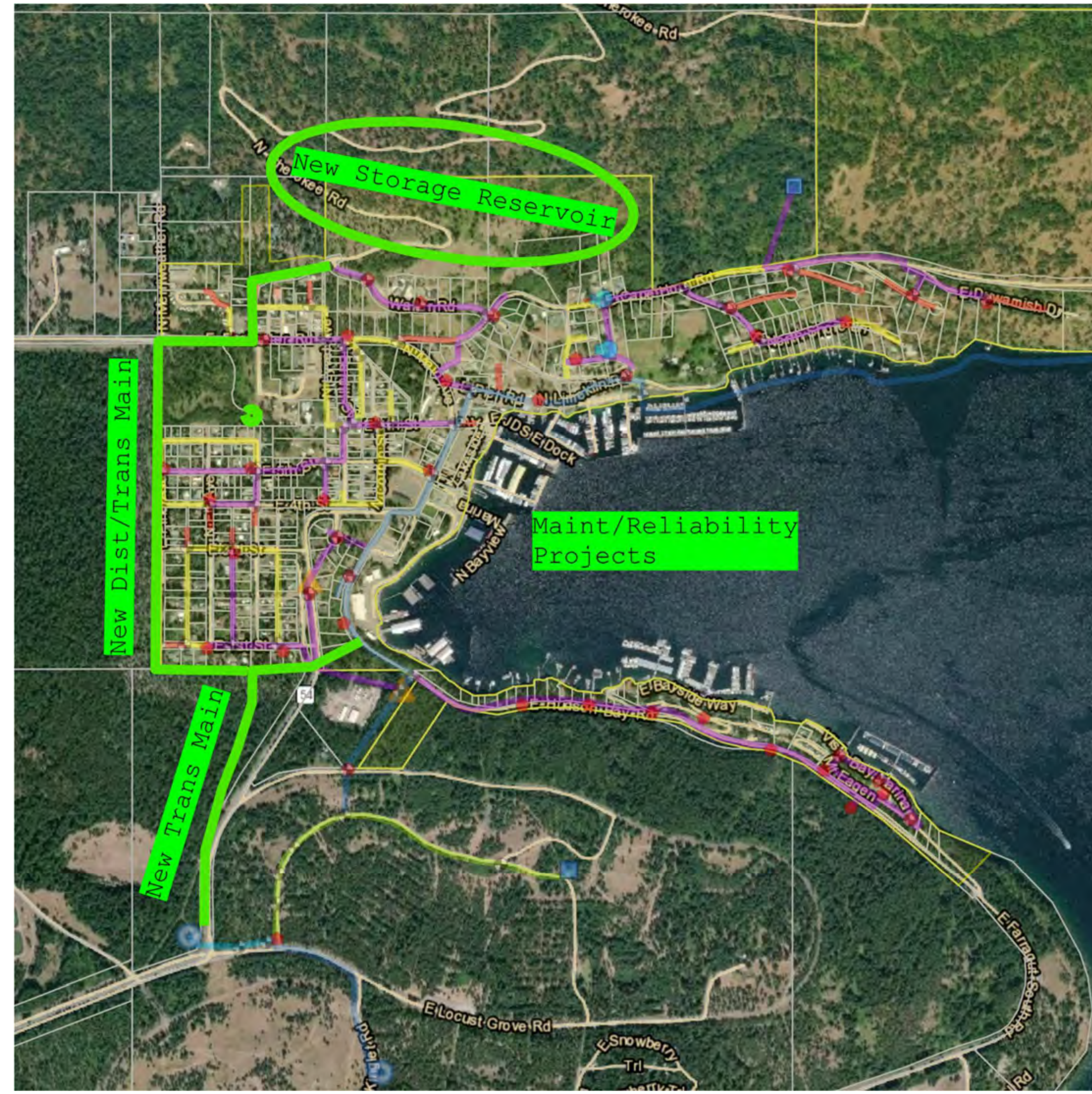
Recommended Project A (New Tank)

1) **New Storage Reservoir – North side of Bayview**
   - Description: New large reservoir to serve all of BWSD, replace Farragut Reservoir and small Dromore tank and booster to increase pressure. Consolidates storage and eliminates a booster station.
     Expected Life – 100 years.
   - Need: undersized Dromore tank (11K gal) and booster, better fire flow, address pressure complaints.
   - **Cost: $1,000,000**

2) **New Transmission Main**
   - Description: Abandon portions of aging/leaky line in Farragut Area and install new line from Well 7 to BWSD (2,800 LF).
   - Need: Replace leaking and aging piping in the Farragut Area.
   - **Cost: $300,000**

3) **New Distribution/Transmission Mains**
   - Description: Connect wells (south side of town) to new reservoir on north side of town (6,300 LF).
   - Need: Improve low pressure and flow problems, increase fire flow capabilities.
   - **Cost: $700,000**

4) **System Maintenance and Reliability Projects**
   - Description: SCADA upgrades, generator at Well 7, PRV rebuilds (4).
   - Need: system reliability in emergency or power outage, system optimization (PRV tuning).
   - **Cost: $150,000**



Total Estimated Cost = $2,150,000

Estimated Monthly User Fee Impact = $16.17

Recommended Project B (Rehab Existing Farragut Reservoir, New Dromore Reservoir)

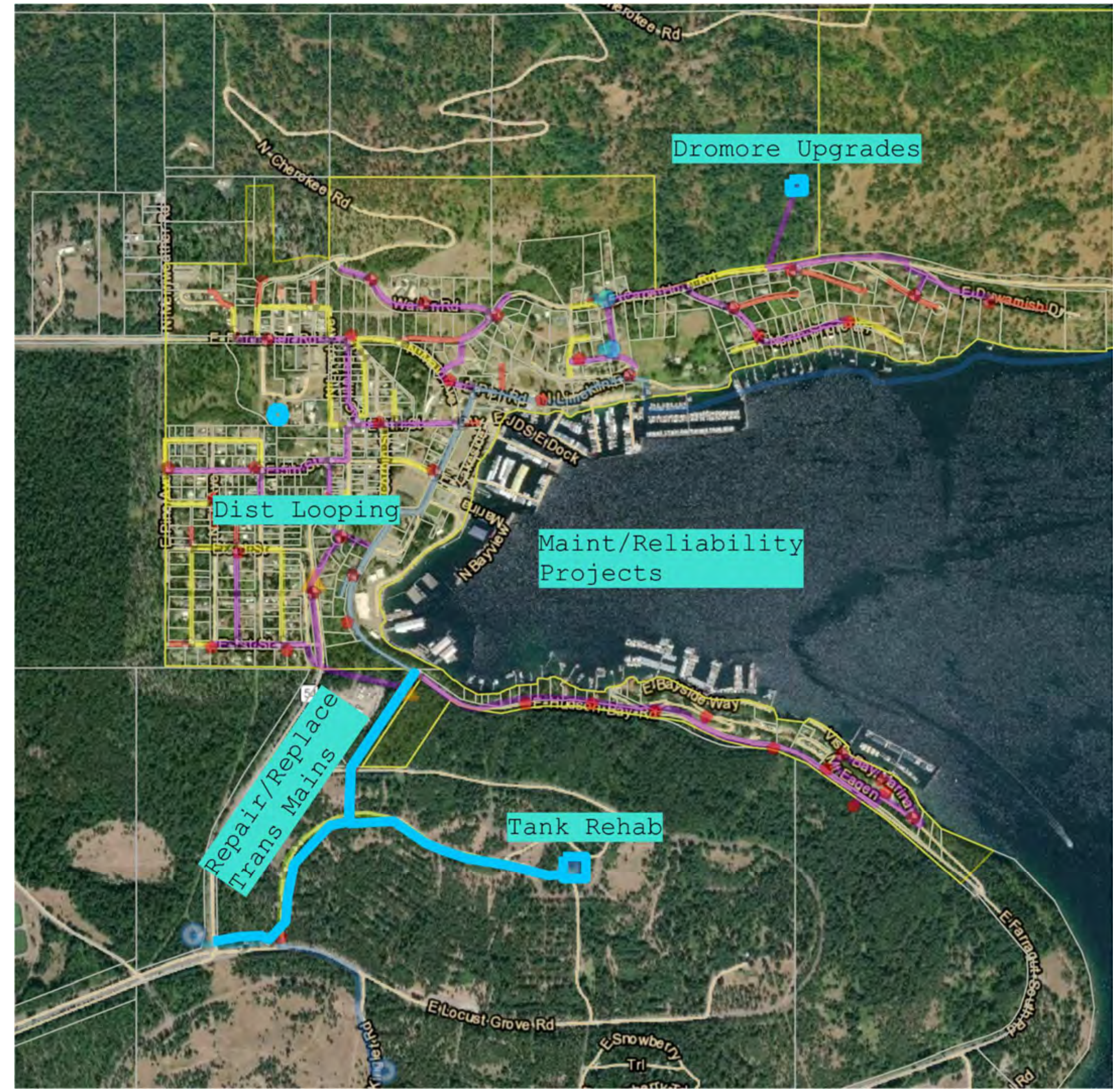
1) **Tank Rehabilitation**
   - Description: paint and lining upgrades to extend the usable life (25-30 years).
   - Need: existing tank is 75+ years old and leaking. Existing internal coating is spalling off.
   - **Cost: $350,000**

2) **Repair or Replace Transmission Mains**
   - Description: repair or replace 5,000 LF of aging 12”, 10”, and 8” lines from Well 7 to Tank, and Tank to Navy facility.
   - Need: 75+ years old, known to have had significant leaks, joints are issue (not pipe itself).
   - **Cost: $500,000**

3) **Dromore Upgrades**
   - Description: replace Dromore Reservoir and booster, potentially move new tank to higher elevation, replace lines.
   - Need: undersized reservoir (11K gal) does not supply adequate domestic or fire flow needs (serves approximately 20 homes).
   - **Cost: $500,000**

4) **Distribution Looping**
   - Description: connect dead end mains.
   - Need: Improve low pressure and flow problems, increase fire flow capabilities.
   - **Cost: $200,000**

5) **System Maintenance and Reliability Projects**
   - Description: SCADA upgrades, generator at Well 7, PRV rebuilds (4).
   - Need: system reliability in emergency or power outage, system optimization (PRV tuning).
   - **Cost: $150,000**



Total Estimated Cost = $1,700,000

Estimated Monthly User Fee Impact = $12.79

Recommended Project C (Minimum Project)

1) **Tank Rehabilitation**
   - Description: paint and lining upgrades to extend the usable life (25-30 years).
   - Need: existing tank is 75+ years old and leaking. Existing internal coating is spalling off.
   - **Cost: $350,000**

2) **Repair or Replace Transmission Mains**
   - Description: repair or replace 5,000 LF of aging 12", 10", and 8" lines from Well 7 to Tank, and Tank to Navy facility.
   - Need: 75+ years old, known to have had significant leaks, joints are issue (not pipe itself).
   - **Cost: $500,000**

3) **System Maintenance and Reliability Projects**
   - Description: Dromore tank re-painting, leak repair, SCADA upgrades, generator at Well 7, PRV rebuilds.
   - Need: system reliability in emergency or power outage, system optimization (PRV tuning).
   - **Cost: $250,000**

No upgrades to Dromore Reservoir or Dromore Pump Station other than cleaning/painting.

Total Estimated Cost = $1,100,000
Estimated Monthly User Fee Impact = $8.27

“No Action” Project

1) Would continue to waste approximately 50% of pumped water
    - approximately $10,000 annually.
    - Wear/tear at 2X for well pumps.
2) Would need to establish a significant repair fund.
    - $8 per user per month for 5 years = $228,000
3) Current customers would have to pay for system repairs/emergencies upfront.
4) Would have to address repairs/emergencies immediately and not have the benefit of very favorable financing terms (30 years, 1.75% interest, partial principal forgiveness).

Estimated Monthly User Fee Impact = $8.00

Meter Replacement Project

Meter Replacement

- Description: replace old and inaccurate meters in Bayview area with more accurate radio read meters. Add meters to unmetered locations.
- Need: increased accuracy, less labor to read (few hours vs. day), increases available flow to customer, year-round readings, better customer leak detection.

Total Estimated Cost = $500,000

Estimated Monthly User Fee Impact = $3.76

Bayview Water & Sewer District: Potential Project Matrix					
ALTERNATIVES	KEY FACTORS				
	Estimated Monthly Cost to Customers	Expected Life	Increase System Storage and Fire Flow	Improved System Pressures/Flow to Customers	Will There Be Significant Future Needs?
Project A (New Tank)	$16.17	75-100	XX	XX	
Project B (Rehab Farragut Res, New Dromore Res)	$12.79	25-30	X	X	X
Project C (Minimum Project)	$8.27	25-30			XX
"No Action" Project	$8.00				XX
Meter Replacement Project	$3.76	20-25		X	

Open House 2 – 8/16/2018

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Bayview Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
AUGUST 16, 2018, 6 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)
Bruce Pennell	☑Yes ☐No ☐Unsure	34474 Cherokee	
Bob & Kea Fisher	☑Yes ☐No ☐Unsure	17156 E Cape Horn Blvd	twofishys@hotmail.com
Marva Jensen	☑Yes ☐No ☐Unsure	34239 N Hollyhock Bayview	same
Don Thrailkill	☑Yes ☐No ☐Unsure	34239 N. Hollyhock Bayview	donthrailkill@gmail.com
Sue Damon	☑Yes ☐No ☐Unsure	33556 N. MacDonalds Dr Bayview	nomadskm@aol.com
Cindy Hansen	☑Yes ☐No ☐Unsure	18226 E Duwamish Dr Bayview	
Jill & Mike Kendel	☑Yes ☐No ☐Unsure	16861 E. Pier Rd Bayview	mkendel@sbcglobal.net
Faye Bare	☐Yes ☐No ☐Unsure	34102 Corbin	683-7018
Jim Jones	☑Yes ☐No ☐Unsure	812 W. York Ave, Spokane 99205	sjz8jpj@q.com
Dave Wojnowski	☑Yes ☐No ☐Unsure	16504 6TH ST	dnjwojo@frontier.com
Jackie Wojnowski	☑Yes ☐No ☐Unsure	16504 6TH ST	✓ ✓
Robert & Nelda Simpson	☑Yes ☐No ☐Unsure	17587 E. Bannock	
Charles Murray	☑Yes ☐No ☐Unsure	16990 Cape Horn	683-3357
Rosemary Brennan	☑Yes ☐No ☐Unsure	34228 N. Corbin Ave	683-3963
	☐Yes ☐No ☐Unsure		

Bayview
Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
AUGUST 16, 2018, 6 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)
Charmaine Tijssen	☒Yes ☐No ☐Unsure	17209 E. Humboldt Ave Bayview, Id 83803	208-683-9010 tijssen@roadrunner.com
Ken & Marilyn Saunders	☒Yes ☐No ☐Unsure	17838 E. Chopunnish, Bayview	208-683-9510 saundersk@earthlink.net
Tim + Debbi Lorenz	☒Yes ☐No ☐Unsure	18050 Duwamish Dr, Bayview	480-682-7329 tlorenz@lkglobal.com
Laurie Manser	☒Yes ☐No ☐Unsure	17474 E Cape Horn Rd Bayview	208 683 1751
Joe & Lyn Haney	☒Yes ☐No ☐Unsure	20104 E Cape Horn Rd Bayview	208 683-1632
Art Jones	☐Yes ☐No ☐Unsure	20330 E Buena Vista Ln, Bayview	208-561-5063
Carrie O'Shaughnessy	☒Yes ☐No ☐Unsure	268 Glacier Lp. Rd, Bayview	208-683-0770
Karen Renn	☒Yes ☐No ☐Unsure	34084 N Scenic Bay	509-993-4840
Power Hoemaker	☐Yes ☐No ☐Unsure	17008 JD's "E" Dock	208-683-0700 (Connected via marina)
M.D. Compton	☐Yes ☐No ☐Unsure	A-16 Senic Bay Marina	509-489-5572
E. [illegible]	☐Yes ☒No ☐Unsure	20139 E Perimeter Rd. Bayview	
Kay Black	☒Yes ☐No ☐Unsure	17280 E Bitter End Marina Rd Bayview	509-981-7143
Bob Prince	☒Yes ☐No ☐Unsure	16587 6th St. Bayview	208-659-3812
	☐Yes ☐No ☐Unsure		
	☐Yes ☐No ☐Unsure		

Bayview Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
AUGUST 16, 2018, 6 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)
Howard Birding	□Yes □No □Unsure	34160 N. Spruce Ave, Bayview ID 83803	
Bruce + Judy Robinson	X Yes □No □Unsure	16057 E 4th	
Bob + Marilyn Weaver	✓ Yes □No □Unsure	34768 Lime Kiln Rd Bayview, ID 83803	
Roger DAHLSEID	X Yes □No □Unsure	1753 E Bannock " " "	
Colleen Dahlseid	X Yes □No □Unsure	17532 E Bannock - Bayview ID 83803.	
GARY MacDonald	X Yes □No □Unsure	17813 E. Hudson Bay Rd, " " "	208-683-2211 macdonaldsresort@gmail.com
TED BARE	X Yes □No □Unsure	34102 N. CORBIN BAYVIEW, ID 83803	208 683 7018
Margaret Nelson	✓ Yes □No □Unsure	34005 N CORBIN BAYVIEW	208 683-3960
Jerry Richardson	□Yes □No □Unsure	16365 E 5th ST 83803	
Kathy Richardson	□Yes □No □Unsure	16365 E 5th ST	
Judy Boykin	□Yes □No □Unsure	16167 E 5th	208-683-1021
Barbara McDonald	X Yes □No □Unsure	33981 Pend Oreille Dr + Patrick	208-683-1615
DEBRA DIEMLER	X Yes □No □Unsure	34560 LYVELL	208-683-1042
Marie [illegible]	X Yes □No □Unsure	34121 N. Corbin	208 661-8259
	□Yes □No □Unsure		

Bayview Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
AUGUST 16, 2018, 6 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)
Norma Jean & Dean Knowles	☒Yes ☐No ☐Unsure	34417 N. Robin, Bayview, ID 83803	NJYesca6@gmail.com
George Chris Gormsen	☒Yes ☐No ☐Unsure	18354 Hwy 54 Bayview Id 83803	Fixinem@gmail.Com
Steve & Linda Jenkins	☐Yes ☐No ☐Unsure	17309 E. North Shore Ln Id. 83803	
Pat + Ginger Flynn	☐Yes ☐No ☒Unsure	Scenic bay Dock A-14	pflynn88@TWC.com
Chris Peck	☐Yes ☐No ☐Unsure	20790 E Cape Horn Rd 83803	Chrispeck1950@yahoo.com
Chuck Walker	☐Yes ☐No ☐Unsure	842 Glacier Loop Rd 83803	
JOSEPH P. MYERS	☐Yes ☒No ☐Unsure	16042 E. SHAEFFER ST 83803	JoeMYERS2018@GMAIL.COM
Ellen Frame (Mary Carruth)	☒Yes ☐No ☐Unsure	17704 E Highway 54 83803	
Ali Spahn	☒Yes ☐No ☐Unsure	33915 N. FIR Ave Bayview 83803	alispahn@yahoo.com
DALE HAMILTON	☒Yes ☐No ☐Unsure	PO Box 12 BAYVIEW 83803	
CARL COSTELLO	☒Yes ☐No ☐Unsure	P.O. Box 332 BAYVIEW ID 83803	
PAUL STANTON	☒Yes ☐No ☐Unsure	~~[illegible]~~	
CAROL STEWART	☐Yes ~~☐No~~ ☐Unsure	PO Box 381 Careywood Id 83809	
Lisa & Ron Fredrick	☐Yes ☐No ☐Unsure	34584 N. Limekiln Rd 83803	
Sioux + John Taylor	☐Yes ☒No ☐Unsure	149 Cape Horn Drive Bayview ID 83803	JT2086831061@hotmail.com

Bayview
Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
AUGUST 16, 2018, 6 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)
JACKIE CLOID	□Yes □No □Unsure	34250 E. CAPE HORN CIR	
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		

Bayview Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
AUGUST 16, 2018, 6 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)
Deano Cowan + Annette	☒Yes ☐No ☐Unsure	17544 E Arapaho Rd Bayview AZ	
Penny Jacobson	☐Yes ☐No ☐Unsure	16374 E 5th Bayview	
Larry & Judy Bergerson	☒Yes ☐No ☐Unsure	16003 E 1st St. Bayview	
W. LEE AST	☒Yes ☐No ☐Unsure	18204 E. DUWAMISH BV	
Daniells, Jonathan	☒Yes ☐No ☐Unsure	34546 N. Lyvel Ave Bayview	
David & Patricia Bennett	☒Yes ☐No ☐Unsure	34216 Flattery Road Bayview	
John Murphy	☐Yes ☒No ☐Unsure	17530 Tweety Bird Ct. MacDonald	
[illegible]	☐Yes ☒No ☐Unsure	A-Dock	
Bo Galley	☐Yes ☒No ☐Unsure	16304 E 4th St Bayview	
MaryJim Grote	☒Yes ☐No ☐Unsure	PO BOX124 BV. 83803.	
J. Charyk	☒Yes ☐No ☐Unsure	34226 N Jeepster	
Ted Galleyo	☐Yes ☐No ☒Unsure	16304 N.E. 4th street	
LOUIS B CHAVEZ	☐Yes ☒No ☐Unsure	856 Rock Springs Rd	
BERNHARD B BLACK	☒Yes ☐No ☐Unsure	17280 E. BITTER END MARINA RD	
JEFF WILKINS	☒Yes ☐No ☐Unsure	216 GLACIER LOOP RD, BAYVIEW	

Bayview
Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
AUGUST 16, 2018, 6 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)
Sheryl Puckett	X Yes ☐No ☐Unsure	16023 E. Schaeffer Str.	
Alyssa Williams	X Yes ☐No ☐Unsure	16032 E Schaeffer Str	
Raquel Kellicut	X Yes ☐No ☐Unsure	33881 N Moonbeam Ct	
Darwin Kellicut	☐Yes ☐No ☐Unsure	" "	
Cynthia Gardner	X Yes ☐No ☐Unsure	17724 NORTHSHORE LANE	
DONALD R. GARDNER	X Yes ☐No ☐Unsure	17724 E NORTHSHORE LN.	
Edith Bishop	X Yes X No ☐Unsure		
Bob Moore	X Yes ☐No ☐Unsure	17686 E. BANNOCK	
Dorothy Johnson	X Yes ☐No ☐Unsure	34230 N Bardill	
MaryAnn Hemlum	X Yes ☐No ☐Unsure	33677 N Fir	
Randy Henderson	X Yes ☐No ☐Unsure	33679 N. Fir	
Dale E. Bymaster	X Yes ☐No ☐Unsure	33727 N. Pine	
Walt & Jan Johnson	X Yes ☐No X Unsure SEWER only	16480 E. 6th	
Crystal + Lee Anderson	X Yes ☐No ☐Unsure	33935 N. Spruce	
Kate Jones	X Yes ☐No ☐Unsure	34416 N Raven Pl	

Bayview
Water & Sewer District

PUBLIC HEARING: ATTENDANCE SIGN-IN
AUGUST 16, 2018, 6 P.M.

Name	Are you connected to BWSD?	Address (Street, City, State, Zip)	Contact Information (Phone and/or Email)
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		
	□Yes □No □Unsure		

Recommended Project A (New Tank)

1) New Storage Reservoir – North side of Bayview

- Description: New large reservoir to serve all of BWSD, replace Farragut Reservoir and small Dromore tank and booster to increase pressure. Consolidates storage and eliminates a booster station.
- Expected Life – 100 years.
- Need: undersized Dromore tank (11K gal) and booster, better , address pressure complaints.
- Cost: $1,000,000

2) New Transmission Main

- Description: Abandon portions of aging/leaky line in Farragut Area and install new line from Well 7 to BWSD (2,800 LF).
- Need: Replace leaking and aging piping in the Farragut Area.
- Cost: $300,000

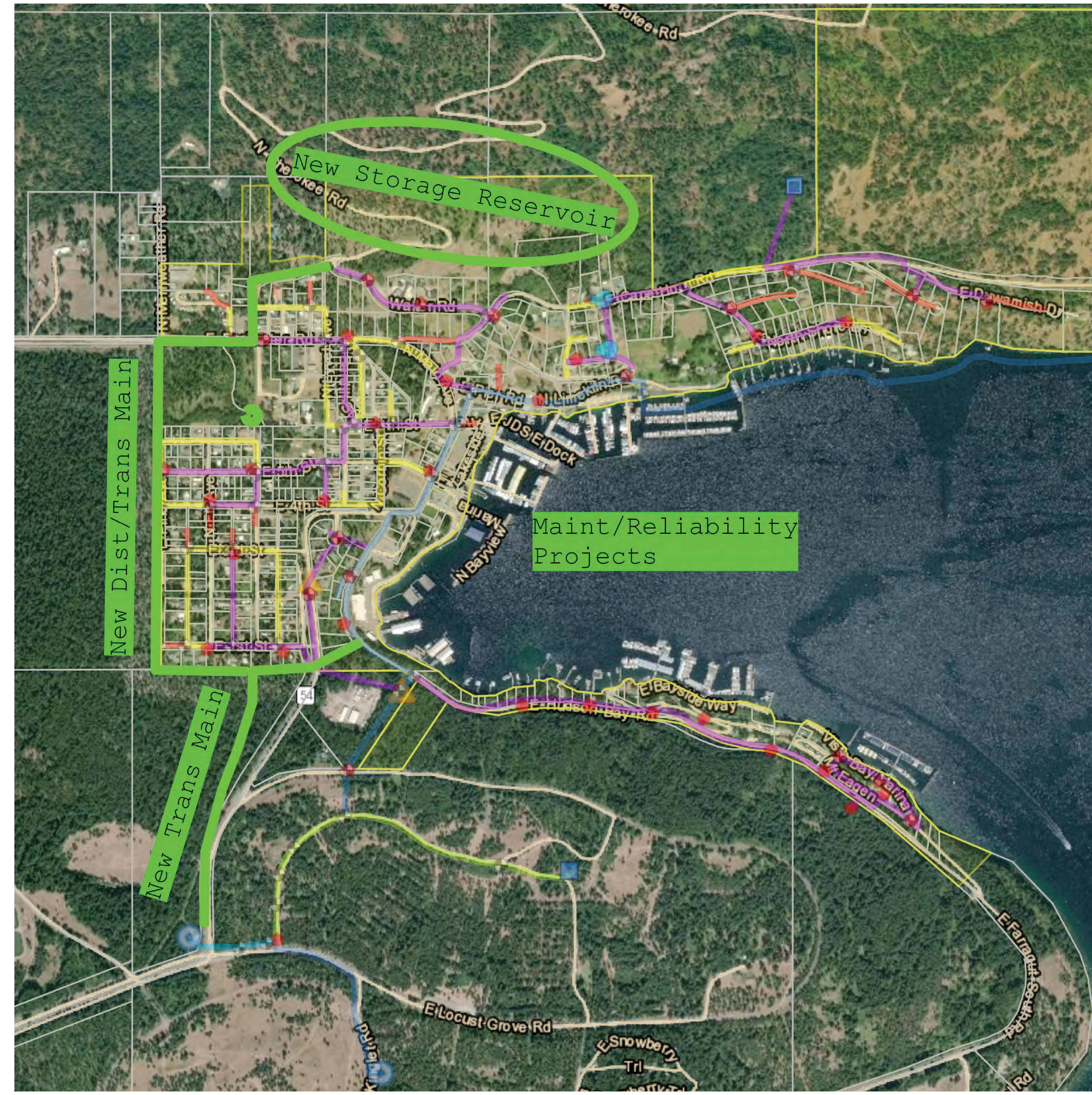
3) New Distribution/Transmission Mains

- Description: Connect wells (south side of town) to new reservoir on north side of town (6,300 LF).
- Need: Improve low pressure and problems, increase capabilities.
- Cost: $700,000

4) System Maintenance and Reliability Projects

- Description: SCADA upgrades, generator at Well 7, pressure-reducing valve (PRV) rebuilds (4).
- Need: system reliability in emergency or power outage, system optimization (PRV tuning).
- Cost: $150,000

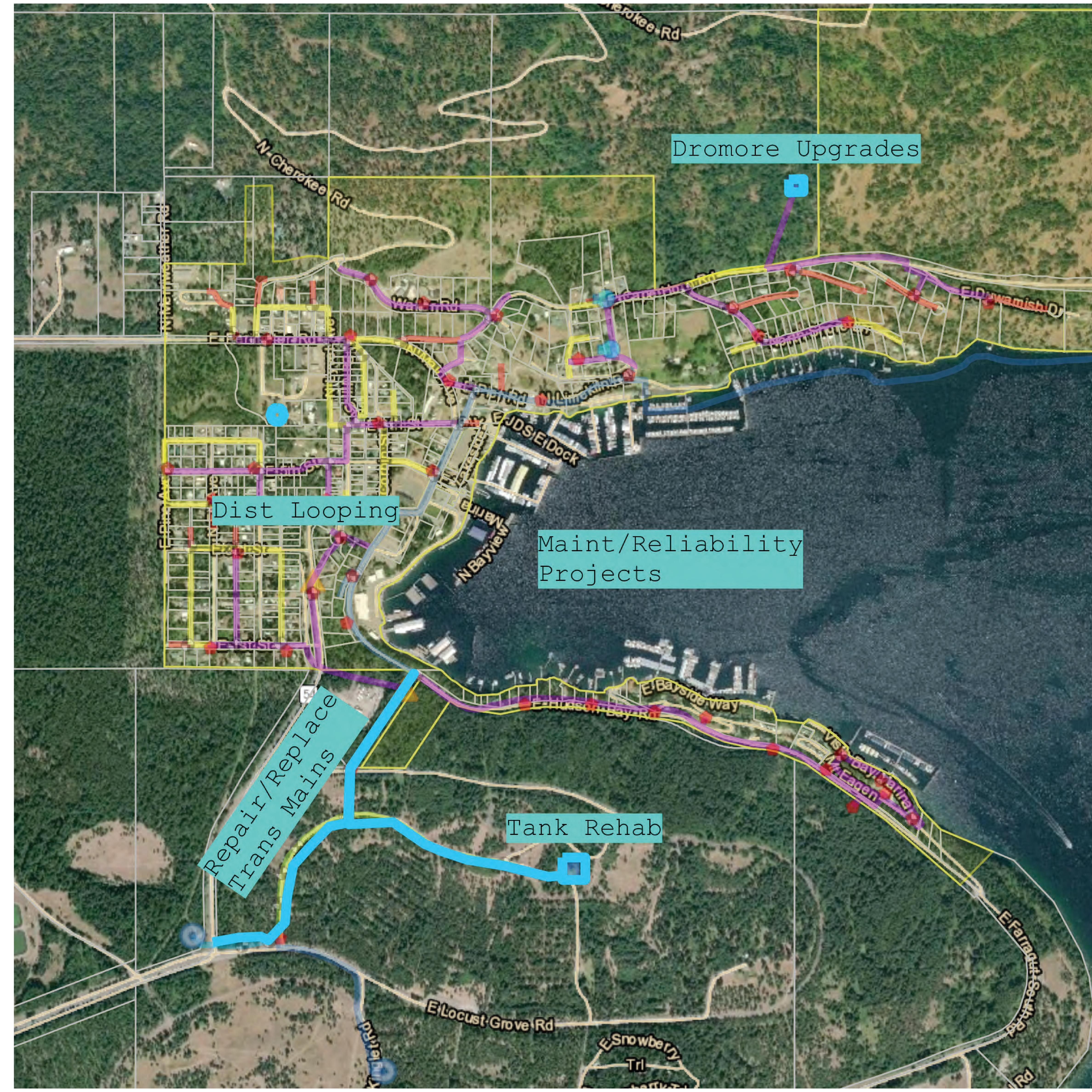
Total Estimated Cost = $2,150,000
Estimated Monthly User Fee Impact = $16.17



Recommended Project B (Rehab Existing Farragut Reservoir, New Dromore Repair)

1) **Tank Rehabilitation**
   - Description: Paint and lining upgrades to extend the usable life (25-30 years).
   - Need: Existing tank is 75+ years old and leaking. Existing internal coating is spalling
   - Cost: $350,000
2) **Repair or Replace Transmission Mains**
   - Description: Repair or replace 5,000 LF of aging 12”, 10” and 8” from Well 7 to Tank, and Tank to Navy Facility.
   - Cost: $500,000
3) **Dromore Upgrades**
   - Description: Replace Dromore Reservoir and booster, potentially move new tank to higher elevation, replace lines.
   - Need: Undersized reservoir (11K gal) does not supply adequate domestic or needs (serves approximately 20 homes).
   - Cost: $500,000
4) **Distribution Looping**
   - Description: Connect dead-end mains.
   - Need: Improve low pressure and problems, increase capabilities.
   - Cost: $200,000
5) **System Maintenance and Reliability Projects**
   - Description: SCADA upgrades, generator at Well 7, pressure-reducing valve (PRV) rebuilds (4).
   - Need: System reliability in emergency or power outage, system optimization (PRV tuning).
   - Cost: $150,000

Total Estimated Cost = $1,700,000
Estimated Monthly User Fee Impact = $12.79



Recommended Project C (Minimum Project)

1) **Tank Rehabilitation**
   - Description: Paint and lining upgrades to extend the usable life (25-30 years).
   - Need: Existing tank is 75+ years old and leaking. Existing internal coating is spalling
   - Cost: $350,000

2) **Repair or Replace Transmission Mains**
   - Description: Repair or replace 5,000 LF of aging 12”, 10” and 8” from Well 7 to Tank, and Tank to Navy Facility.
   - Need: 75+ years old, known to have had leaks, joints are issue (not pipe itself).
   - Cost: $500,000

3) **System Maintenance and Reliability Projects**
   - Description: Dromore tank re-painting, leak repair, SCADA upgrades, generator at Well 7, pressure-reducing valve (PRV) rebuilds.
   - Need: System reliability in emergency or power outage, system optimization (PRV tuning).
   - Cost: $250,000

Total Estimated Cost = $1,100,000
Estimated Monthly User Fee Impact = $8.27

“No Action” Project

1) **Would continue to waste approximately 50% of pumped water**
   - Approximately $10,000 annually.
   - Wear/tear at 2X for well pumps.

2) **Would need to establish a repair fund.**
   - $8 per user per month for 5 years = $228,000

3) **Current customers would have to pay for system repairs/emergencies upfront.**

4) **Would have to address repairs/emergencies immediately and not have the of very favorable terms (30 years, 1.75% interest, partial principal forgiveness).**

Estimated Monthly User Fee Impact = $8.00

— ThIS PRoj ECT IS AN o PTIo N AS ADD-o N o NLy To PRoj ECT A, B o R C. —

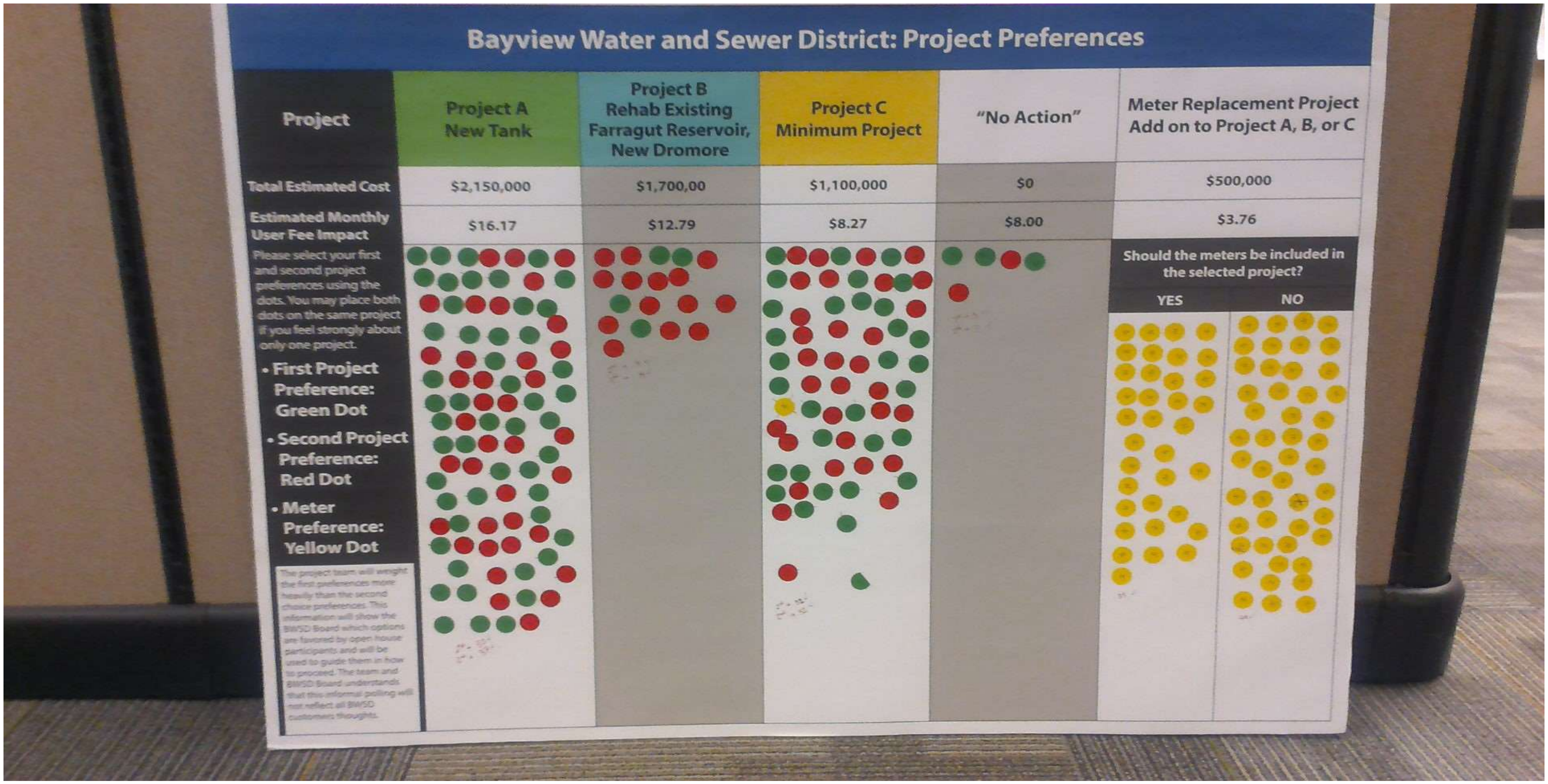
Meter Replacement Project

Meter Replacement

- Description: replace old and inaccurate meters in Bayview area with more accurate radio read meters. Add meters to unmetered locations.
- Need: increased accuracy, less labor to read (few hours vs. day), increases available to customer, year-round readings, better customer leak detection.

Total Estimated Cost = $500,000
Estimated Monthly User Fee Impact = $3.76

Bayview Water & Sewer District: Potential Project Matrix					
ALTERNATIVES	KEY FACTORS				
	Estimated Monthly Cost to Customers	Expected Life	Increase System Storage and Fire Flow	Improved System Pressures/Flow to Customers	Will There Be Significant Future Needs?
Project A (New Tank)	$16.17	75-100	XX	XX	
Project B (Rehab Farragut Res, New Dromore Res)	$12.79	25-30	X	X	X
Project C (Minimum Project)	$8.27	25-30			XX
"No Action" Project	$8.00				XX
Meter Replacement Project	$3.76	20-25		X	



Bayview Water and Sewer District: Project Preferences
Project
Project A New Tank
Project B Rehab Existing Farragut Reservoir, New Dromore
Project C Minimum Project
"No Action"
Meter Replacement Project Add on to Project A, B, or C
Total Estimated Cost
$2,150,000
$1,700,00
$1,100,000
$0
$500,000
Estimated Monthly User Fee Impact
$16.17
$12.79
$8.27
$8.00
$3.76
Please select your first and second project preferences using the dots. You may place both dots on the same project if you feel strongly about only one project.
• First Project Preference: Green Dot
• Second Project Preference: Red Dot
• Meter Preference: Yellow Dot
The project team will weight the first preferences more heavily than the second choice preferences. This information will show the BWSD Board which options are favored by open house participants and will be used to guide them in how to proceed. The team and BWSD Board understands that this informal polling will not reflect all BWSD customers thoughts.
Should the meters be included in the selected project?
YES
NO

Bayview Water and Sewer District: Project Preferences						
Project	Project A New Tank	Project B Rehab Existing Farragut Reservoir, New Dromore Reservoir	Project C Minimum Project	Project D “No Action”	Meter Replacement Project Add on to Project A, B, or C	
Total Estimated Cost	$2,150,000	$1,700,00	$1,100,000	$0	$500,000	
Estimated Monthly User Fee Impact	$16.17	$12.79	$8.27	$8.00	$3.76	
Results from Dots Placed at Open House (Approx. 85 people; 77 registered voters)*						
First Project Preference: Green Dot	50	4	32	3	Should the meters be included in the selected project?	
Second Project Preference: Red Dot	37	14	32	2	YES	NO
Total Dots (1st and 2nd)	87	18	64	5	35	48
Weighted Scores (1st=2 pts; 2nd=1pt)	137	22	96	8		
Results from Preferences Noted Via Email/Proxy/Once Dots Ran Out at Open House (41 people; 33 registered voters)*						
First Project Preference: Green Dot	30	0	6	5	Should the meters be included in the selected project?	
Second Project Preference: Red Dot	8	14	4	1	YES	NO
Total Dots (1st and 2nd)	38	14	10	6	12	13
Weighted Scores (1st=2 pts; 2nd=1pt)	68	14	16	11		
OVERALL RESULTS* (Approx. 126 people; 110 registered voters)						
First Project Preference: Green Dot	80	4	38	8	Should the meters be included in the selected project?	
Second Project Preference: Red Dot	45	28	36	3	YES	NO
Total Dots (1st and 2nd)	125	32	74	11	47	61
Weighted Scores (1st=2 pts; 2nd=1pt)	205	36	112	19		

*Please Note: Not everyone gave 2nd and meter preferences. Everyone gave at least the 1st preference.

Bayview Water & Sewer District

PUBLIC OPEN HOUSE: COMMENTS - WATER SYSTEM

AUGUST 16, 2018, 6 P.M.

Name and Contact Information: BOB MOORE
208-683-5707 jeanm1936@icloud.com

Comments:
I voted for option A because:
1 - The system is aging and in constant need of repair.
2 - plan and act for the future of Bayview.
3 - The need for action will only be greater in the future and more expensive.
4 - ignore the nay-sayers as there are those who will always be that way.

The ladies explaining the whys and wherefores were wonderful considering some of the comments and questions

Project Packets Preferences:

If you did not attend the open house on August 16, you can still make your project preference(s) known to the BWSD Board. The project packet options can be found on BWSD's website. Based on the four project packet options, A – New Tank, B – Rehab Existing Farragut Reservoir/New Dromore Reservoir, C – Minimum Project, or the "No Action" Project, **please email your first and second preference to BWSD@jub.com by Monday, August 20, at 5 p.m.** If you feel strongly about only one project packet, you can list that for both your preferences. Additionally, please let us know if you think the Meter Replacement Project should be included in your preferred options or not ("Yes" or "No").

Example: Project packet preferences for Joe Smith:
- 1st Preference: Project A
- 2nd Preference: Project B
- Meter Project: No

The project team will weight the first choice preferences more heavily than the second choice preferences. This information will show the BWSD Board which options are favored by open house participants and will be used to guide them in how to proceed. The team and BWSD Board understands that this informal polling will not reflect all BWSD customer's thoughts.

Additional Public Input

Ellery Howard

From: Roger and Colleen Dahlseid <missionvlydoc@gmail.com>
Sent: Wednesday, June 27, 2018 9:00 AM
To: Ellery Howard; BWSDSharonmeyer@hotmail.com; rdoney@verizon.net; Robyn Edwards; Stephen May; jjbwsd111@yahoo.com
Subject: Public hearing information

Directors and Ellery Howard,

After much contemplation of the meeting yesterday, I do not feel I was candid enough with you in our discussion.

I felt that the meeting on June 20th was a lost opportunity. I also feel that if you continue on your present approach to the bond alternatives, the project in it's entirety may very well become another "lost opportunity".

My comments are intended to be constructive, and are filtered by my own personal desire to see the users of the district get the most value for the $ they can afford and the most critical deficiencies of the system be addressed.

The way the two options: <u>new vs rehab</u> are presently constructed, with a $4.00 difference in monthly costs, essentially makes them one in the same. To continue down that road potentially provides 2 choices--and risks the very likely results of forcing a minimum option or worse yet, to do nothing.

I feel that there has not been an awareness or an effort to construct a viable option that addresses the fact, given our current number of users and their income status, that we simply do not have the ability to afford the increases required to finance projects of this size, To put it bluntly, an inability to be in touch with the user base. I know that you don't want to be looking at this again in 30 years when the DEQ loan is paid, but it may be a fact of life that the projected user base approximating close to 700 people at that time, will be more able to absorb the increase in fees than our present 473 user base. I have not seen this fact given the consideration I feel it warrants.

When Steve says that we just can't seem to "run the numbers" to give our low and fixed income users an alternative, I have not seen any effort to do that. I know that to alter the rehab option to the minimum of a 60k tank for Dromore is not ideal, but it may very well be all that your user base can handle at this time. They have the intellect to weight the option, they are not being given the opportunity. I would say the same principal can be applied to the new construction option, can the new tank be scaled down to 275,000 gallons to give some cost relief?

What I am trying to convey is that a dedicated effort to come up with a rehab option that will actually be a cost effective option needs to be given consideration.

My final comment is the costs--I brought up the fact yesterday that new construction cost per gallon on the the new 300,000 tower is indicated at $3 (considering $100,000 of the 1 mil is for land- or $3.33 if no land allowance) while the new construction for the Dromore tank is shown @ $5 per gallon. Ellery, you mentioned that the figure included the lines, however, the figures presented add an additional $400,000 for lines.
If you are adding a 20% contingency or whatever it is, it needs to be consistent and done across the options in a clearly definable amount. The way it is now, it clearly indicates "skewed" figures and leads people to draw the conclusion of bias.

Thank you for taking the time to read this and hopefully consider it. Please know that my intent here is to better the situation and not be critical of any of you or the process. Again, I don't want all this effort to end up as a missed opportunity.

Colleen Dahlseid

Ellery Howard

From: Ellery Howard
Sent: Monday, July 9, 2018 10:14 AM
To: Tribbett, Tara (trib9125@vandals.uidaho.edu)
Cc: Gemma Puddy; Katy.Baker-Casile@deq.idaho.gov
Subject: RE: BWSD follow up questions

Hi Ms. Tribbett,

Thanks for your interest in understanding the issues that have been presented to the public regarding the preliminary findings of the planning effort for the BWSD's water system. Keep in mind that this is a separate (yet related) issue from the potential revenue bond election that would be considered in November. Currently we are working on a Water System Facility Plan that reviews the existing water system and identifies the strengths as well as the needs/deficiencies and recommends potential projects to address them. Part of the effort of the Facility Plan involves collecting the public's input. That's currently where we are at in the process. Obviously, the potential revenue bond is related because it is the method that the BWSD Board is considering as a way to pay for the projects to address the system deficiencies. However, I just wanted to clarify that they are separate processes. BWSD is moving both of these along concurrently to take advantage of the very favorable financing terms of the IDEQ loan that they were approved for. Let me know if you have any further questions related to this aspect. Katy Baker-Casile at IDEQ may also be a resource for additional questions that you may have related to their requirements. Her e-mail is katy.baker-casile@deq.idaho.gov

Below, I have attempted to provide answers to your questions in blue as best as I can at the moment. As I noted in previous e-mails, I wanted to wait to respond until I had all of the information that I needed. BWSD and I had been working with KEC (electrical provider) to provide some of the necessary information. Also keep in mind that the planning effort for the Water System Facility Plan is ongoing and refinements (based on further information and public input) will be made.

ELLERY HOWARD, P.E.
Project Manager

J-U-B ENGINEERS, Inc.
7825 Meadowlark Way, Coeur d'Alene, Idaho 83815
e ehoward@jub.com *w* www.jub.com
p 208 762 8787 *f* 208 762 9797

JUB | THE LANGDON GROUP | GATEWAY MAPPING INC.
OTHER J-U-B COMPANIES

From: Tribbett, Tara (trib9125@vandals.uidaho.edu) [mailto:trib9125@vandals.uidaho.edu]
Sent: Thursday, June 21, 2018 1:19 PM
To: Ellery Howard <ehoward@jub.com>; Gemma Puddy <gpuddy@langdongroupinc.com>
Subject: BWSD follow up questions

Hi Ellery and Gemma,

There are a lot of questions I have after your presentation yesterday, so I'll just jump right in. I am collecting information for our local paper about the proposal for a water system upgrade.

First, can you email me a copy of the PowerPoint presentation. This would be a good reference point for me. I also wanted to know if you have maps in pdf form which are more extensive, and show the outlay of the water system of Bayview, plus maps of our Bayview septic system.
The information that was presented in the Open House and last meeting is still in draft form and is currently being updated. We are in the process of developing some handouts for the public that could be made available as a pdf. I will let you know when those are available. There is also an FAQ on the BWSD website related to the revenue bond that may provide you with some answers to bond questions.

Secondly, I just wanted to start with some historical questions, which I wonder if you garnered from your analysis: (The more information you can give me, the more precise information, the better)

(1) How long has this been going on, the leakage at this peak level, which is what again?
BWSD has historically dealt with leaks in the old lines between the wells, tanks, and town which were part of the old Farragut naval installation. I have assisted BWSD with the design of some of these repairs dating back about 15 years. The joints on the older pipes just tend to slowly begin leaking over time. Over the years, BWSD has also had a local excavator assist them with repairs on this older pipe. During the current planning effort, I have attempted to quantify the amount of "non-revenue" water – basically the difference in what is metered at the wells and what goes through the individual meters at the point of delivery. In years 2015 and 2016 it was more, but the non-revenue water is currently around 50 million gallons per year based on 2017 data. While there are some connections that are not metered (mainly the Navy), all signs indicate that most of the "missing" water is due to leaks.

(2) What was the determined cost to the community, per person on their water bills, for this leakage?
BWSD spent over $19,200 in 2017 for the electrical charges for the wells. Currently the non-revenue water is about 50% of what is pumped, so there is an estimated "cost" of around $9,600 in electrical costs. In addition, the pumps are having to work twice as much as necessary and the wear and tear reduces the expected life by about 50% as well. That is a "cost" that doesn't show up until the pump wears out. BWSD does not specifically charge for this non-revenue water – it is just a part of the costs included in the water bill (like regular maintenance, personnel, minor repairs, electricity, etc.). There is a base fee for water service of $24, which includes up to 5,000 gallons per month (as measured at the individual meters).

(3) How much money did JUB earn from the two $45,000 grants from IDEQ to study the existing water system?
These grants are a 50% reimbursable grant through IDEQ up to the total of $45,000. In other words, for every $1 that BWSD spends on IDEQ-approved tasks related to this Water System Facility Plan, they can request reimbursement for $0.50 up to a maximum of $45,000. Currently BWSD has requested reimbursement for $29,951, which includes $27,576 to JUB for the Water System Facility Plan and $2,375 for the underwater video review of the water line in the lake that serves the Cape Horn area. These have all been reviewed and approved by IDEQ.

(4) What is the maximum amount of the loan which Bayview Water and Sewer District has been approved for? And, can I get a copy of each of the proposals for the July meeting and their detailed cost JUB would charge for each option?
BWSD has been approved for up to $3,332,000 of a potential loan (1.75% interest, 30 year term) with up to $214,464 principal forgiveness. The potential projects that will be presented in the upcoming July meeting are currently being developed. Many scenarios/projects have been discussed in the last Open House, the numerous public workshops, and the last public meeting. What will be presented in the July 26 meeting will be a culmination of those discussions. Keep in mind that JUB will not "charge" additional for the preparation of these potential projects as it is part of the process for the Water Facility Plan. Also note that JUB is an engineering firm and that any actual future construction would be performed by public works contractors after a public bid process. We prepare estimates of these future construction costs based what we believe that public works contractors will charge for the work.

(5) I need more specific information about the projects JUB has proposed to the Board of BWSD, and their costs?
As was discussed in the last meeting, the potential projects to correct the known existing system deficiencies will be presented at the July 26th meeting. At that time, the ESTIMATED costs will presented as well. Once again, keep in mind

that these estimated costs will be used for budgetary purposes only. The actual costs will be determined once any future projects are bid, awarded and constructed.

(6) How many houses are connected to the BWSD water system? Many people in the meeting eluded to the fact they can vote on this issue, but they are not on BWSD water system-how many houses has JUB estimated are on private systems?
According to BWSD records, the water system had 473 connections at the end of 2017. There are also at least 4 small water systems within the BWSD district boundary but are not currently connected to the BWSD system. Each of those systems have about 10-20 connections (or potential connections) each. So there are 60 – 80 potential future connections to the BWSD system within those small water systems.

(7) Has any contact from JUB been made to future real estate developers, or any associate at Super1 in Athol, about this BWSD proposal?
No.

(8) Will JUB be able to consider my request to establish this infrastrcuture system so it runs on green energy-what would this look like, in detail? Ellery, do you have specific experience with this kind of engineering where free green energy is linked to water infrastructure?
Green infrastructure costs are always considered in planning efforts such as this. This typically involves looking for ways to increase the efficiencies of the infrastructure (pumps, lights, etc.) to reduce the electrical demand. Reducing the leaks by a significant amount is the easiest way to achieve a significant reduction in the electrical costs. We have been working with the local (and only) electrical provider to review/audit the BWSD water system and they have concurred that leak reduction is the best way to reduce electricity demand. The provider, Kootenai Electric Cooperative, is a local electrical cooperative that is able to get some of the lowest electrical costs in the nation for the benefit of their users. As you know, other forms of power such as solar or wind would require an additional upfront cost to install. I do have experience with the design of solar powered pumps, etc. for remote water system locations. However, I have yet to find where any energy is provided free of some kind of charge (maintenance, installation, etc.). As always, if you have some information on this, I would be very interested in it. Please feel free to pass it along to me or the BWSD Board.

(9) What is the overall cost quoated by JUB to BWSD at this juncture in the project potential? Be specific with numbers please.
As indicated earlier in this e-mail and in previous meetings, one of the key issues is to determine if the Board and public want to try and rehab the existing Farragut Tank and replace the Dromore Tank or build a new tank to serve all of the district with better flow and fire protection. The estimated costs for these options will be presented at the next meeting on July 26 and be available to be publicly discussed. This public input that is gathered over the next few months will be used by the Board to determine how they proceed with the revenue bond in November.

(10) Has JUB received any information from the federal or state of Idaho government about emerging public infrastructure projects sourced out through private contracts? If not, how did JUB find out about this project?
I'm a little unclear on what you are asking here. What I can tell you is that BWSD utilized a publicly advertised request for proposals that was answered by a number of engineering firms in accordance with State Law (qualification based selection). This process was required and approved by IDEQ in order to use their funding. BWSD interviewed several firms and ended up selecting JUB in 2017 to assist them with this planning effort.

(11) I need your copies of information gathered about the Navy's part in paying for any of this infrastructure, what their "flat rate fee is (Ellery said this), and how much water they are using based on whatever measurements (per month?) you use to assess water consumption in Bayview.
The Navy originally donated Well 7, the tank in the Farragut area, and the associated piping to the BWSD in the mid-1970's. Part of the condition at that time was that BWSD would continue to serve them. They currently pay a flat fee of $330 per month, but their true water use is unknown as there is not a meter on both of their large diameter connections to the BWSD system. We have had several productive meetings with the local Navy administration and have gained a better understanding of their current and planned futures uses within their facility. Ways to potentially meter the large

pipes connecting their system to the BWSD system have been a major point of those discussions. Metering these large diameter connections is not an easy (or inexpensive) task. However, the Navy has replaced virtually all of their water system components (inside the fenced area) in the last 10-15 years, so we believe that they most likely do not have any significant leaks.

(12) Where, specifically, is the water leakage most eggregious, if this became a piecemeal project, and what would the cost be for this rehab scenario?
The pipes from Well 7 to the Farragut Tank, and then down into town are believed to be the majority of the leaks. This is due to the age of the pipe (installed in 1940's) and the type of joints in that piping, as well as the known historical leaks that have been addressed over the years. Estimated costs for rehab vs. replacement of these pipes will be presented at the July 26 meeting.

(13) Are you absolutely sure Farragut State Park is not on the Reservoir tank the town is using, because there are spickets all over the park? What water system do they run off, and what can you tell me about that? I have a hard time believing their old infrastructure from the Navy does not still run to the main tank?
Yes – the water systems that serve Bayview and the Park are completely separate. The main tank for the Park is on your left as you enter the Park and pass the Park HQ. There is an emergency connection valve between the two systems that is closed. It is only opened during an emergency.

(14) Ellery, you mentioned lead in the joints. Is our water currently being tested for lead, and can you speak to lead in our water system more? Did you measure lead levels in your analysis?
The lead in the joints that I mentioned in the old piping is not in direct contact with the water. There is a gasket in between it and the water. As part of their yearly testing, BWSD tests for lead and other constituents. Testing for last year (and previous years) has shown lead levels well below the regulatory action level. A copy of the water quality report for 2017 is available on the BWSD website.

Can I have the contact information of the bond lawyer who was on the panel at the meeting? I have specific questions about bond convenants.
The bond counsel will be at the next meeting in July 26 to answer any questions at that time. If you had some specific questions, I would encourage you to submit them to BWSD as soon as possible. As other people may have the same questions as you, it may be very helpful to use your list to add to the existing FAQ sheet that would provide more information related to the bond.

Thank you for your thorough, expeditious responses.

If I were you, I would be more forthcoming and articulate with information, because that meeting was a disaster. Our community has a gradient of wealth status, and is mirroring the private affluence coupled with poverty of those living off social security checks only, and public decay of infrastructure we are experiencing as a Nation. I felt, overall, this presentation, was extremely tone deaf to this, and the glaring fact our community is full of white hairs, which won't live to see this loan paid off. If this project is so costly it can't be paid off sooner, it's not going to float in the ballot box.

In education,

Tara V. Tribbett, M.Ed.

To learn, read.
To know, write.

Ellery Howard

From: Roger and Colleen Dahlseid <missionvlydoc@gmail.com>
Sent: Sunday, July 15, 2018 4:01 PM
To: BWSDSharonK@hotmail.com; r.doney@verizon.net; Robyn Edwards; Stephen May; jjbwsd111@yahoo.com; Ellery Howard
Subject: BWSD Workshop July 16, 2018

I am contacting you today as an observer that has attended all but one of your water facilities planning workshops. In the absence of a "Goal Statement", if I were asked to state the goal of the effort I have observed, I would have to say:
"To spend every $ we can of the cheap money being offered, thereby, providing an infrastructure far beyond the needs of the district and far beyond what our small and limited income user base can afford."

I would like each of you to consider a new approach to this project at the meeting tomorrow. One that lines up with the following stated goal:
"To resolve the most critical deficiencies identified by the water facilities study at the lowest possible cost to the BWSD user base."

I realize that this would necessitate a huge departure from the scenarios that you have presented so far for the proposed bond. Building a 100 year life new reservoir would probably not line up with that goal nor would running a $700,000 new distribution system. The Dromore tank would most likely have to be considered in terms of meeting the minimum requirements. It could effect the way you look at the scope of replacing the existing water meters. I believe it wold require a fresh approach, to look at every component of each proposed scenario in what we call "a zero-based" budget concept. Is this component necessary to resolving the most critical deficiencies. Is it needed or just "wanted" because it is the latest and best? Can if be justified by a cost/benefit analysis? Will it result in a cost that is beyond our user group's ability to pay?

It won't be fun and it won't be easy but it just could result in something that is credible and shows a true dedication to consider this from what the real needs are. Addressing what we can afford until such time as our user base is larger and more affluent and can handle the cost of a larger infrastructure project. I believe the user base will recognize the credibility of this approach and appreciate your consideration on their behalf.

None of us can guarantee what the result would be in the final bond election, but it would go a long way in showing your approach was designed by a true concern for the cost vs the benefit to the guy you are soliciting the vote from; one that deserves their serious consideration.

This is not an easy job you have, but leadership does matter and you can make our system better at a price folks can afford.

Colleen Dahlseid

Ellery Howard

From: Roger and Colleen Dahlseid <missionvlydoc@gmail.com>
Sent: Tuesday, July 17, 2018 12:01 PM
To: Ellery Howard
Subject: BWSD Workshop yesterday

Just wanted to thank you again for your consideration in yesterday's meeting.

I wish that the discussion of the meters and the new option C hadn't been at the very end of the meeting when Jan had to leave and not a lot of discussion happened.

Considering your thought on handling the meter replacement on an annual basis together with the Emergency Management and Fire concerns with the Dromore tank, would it be more beneficial to withdraw the meter project than the Dromore?
When you consider the fire flow issues, the benefit of Dromore extends far beyond the few users.

Just a thought I wanted to bring up.

Thanks again.
Colleen

Ellery Howard

From: Ellery Howard
Sent: Wednesday, August 8, 2018 2:09 PM
To: 'Sheryl Puckett'
Cc: Stephen May; Meyer; r.doney@verizon.net; robynedwardsbayview@gmail.com; Jan Jones
Subject: RE: Why does this idea seem so good?

Hi Sheryl,

I really do like to see these type of responses from people because it means they are engaged and actively looking for solutions! So thank you for being a conduit and passing them along. With that said, let me dive right into a response to this well thought out question.

First of all, the major issue with the expected life span of the Farragut Tank is indeed the structural integrity of something that is 75+ years old and was built during the 1940's when construction practices and materials handling were not the same as today. Along those same lines, is that the existing tank only holds water in the upper 1/3 of the structure so any additional significant weight (ie. Stainless steel liner) will only add to the problem. Another issue with a steel liner is that if you made it just slightly smaller than the concrete tank, then you would not have any way to weld, maintain or inspect the backside of the steel liner. If you made the steel liner smaller in order to have some space to construct and maintain it in the future, then the volume of the tank would be significantly reduced.

Probably the biggest challenge to putting something like a steel liner on the inside of the existing tank is that there are 4 concrete columns on the inside of the tank that help hold the roof up. They are located about half way between the tank wall and the center of the tank. On top of these columns are concrete beams that connect each of the 4 columns. Basically, there is a box frame inside of the tank that would make setting some other tank inside very difficult if not impossible.

The issue with putting a good long-lasting coating on the inside really is a function of how well the existing coating is removed. In the past, we have written very good specifications that require complete removal of the coating as well as leaving the surface rough enough to hold the new coating. All surfaces are inspected before they are coated. In just the past 10 years, significant advances have been made with coatings that can "build" thick layers and yet stay semi-flexible and seal cracks. Another option on a concrete tank is to use a custom fit pvc liner that is essentially hung around the edges above the water line. Either of these options are a good choice for the rehab of the existing Farragut tank. Here again, the interior columns/pilasters do indeed make this a bit challenging.

As I pointed out earlier, one of the big questions for Bayview is do we invest significant funds (approx. $350K) for the rehab of a structure that only has about 25-30 years of remaining life or invest in a new tank that is more expensive, but has a much longer life span, increases the fire flow capabilities, and also addresses the issues with the Dromore tank? What's interesting to note is that expected life of a rehabbed Farragut tank is close to the same as the 30 year loan from DEQ. In other words, at the end of 30 year loan, the issue of a new tank will need to be addressed once again.

Hopefully this answers your questions. Thanks again for asking questions and trying to gain a better understanding of the issues facing the water BWSD water system!

-Ellery

From: Sheryl Puckett <sherylpp@gmail.com>
Sent: Monday, August 6, 2018 1:48 PM

To: Ellery Howard <ehoward@jub.com>
Cc: Stephen May <newday@roadrunner.com>; Meyer <meyer6420@roadrunner.com>; r.doney@verizon.net; robynedwardsbayview@gmail.com; Jan Jones <janjones111@yahoo.com>
Subject: Why does this idea seem so good?

This idea seems to have merit.
Sheryl

> 1. I was thinking about the problems that Bayview Water and Sewer were having with the water system, especially, the big water tanks. It struck me that repainting the tanks may invite the same thing to happen. It would depend on the adhesion of the coating and the quality of the materials and application. It then occurred to me that the problem is with the skin of the inside of the tank not the structure of the tanks. I thought, "Why not put a modern tank inside the existing concrete structures. A stainless steel liner would not have to be as strong as a freestanding tank because the old tank could support it. And it would last many years. There may be other modern tanks made of fiberglass or plastic that could be used for many years. **More importantly, they would have a known life expectancy.** Hope this explains my ideas on the matter.
>
> David Tomberg

August 19, 2018

BWSD Board of Directors
Ellery Howard, JUB Engineers

Thank you all for the opportunity provided at the public open house on August 16th. I appreciate your willingness to listen to the district users and provide information.

There were those that don't care what the bond options are and will contend with the Board on anything that you do. My only comment here is to say that I am glad there were only a very few.

Two distinct user groups, occupying opposite ends of the spectrum, became clearly visible in the "straw-poll" vote:

>) The more affluent group, many being summer residents that are not registered to vote in our elections. A growth initiative and the finances to make it happen are no problem to these folks.
>
>) The original Bayview residents and those new retirees who are buying up the old properties in Bayview and rehabbing them into modest retirement homes. Folks having lower and fixed incomes who cannot afford the financial burden and would like to see future growth fund itself.

As you make the difficult decision between the two contrasting bond options, I am seeking your recognition that many of those supporting the growth option--"A"--won't be here in November and do not have legal residency to vote if they were here. The lower and fixed income residents will be here and will vote their pocket books in November.

I cannot think of a more disappointing outcome than to have the bond election fail.

Thank you for your time and consideration.

Colleen Dahlseid

Appendix 4-B

Technical Review Letters

THIS PAGE WAS INTENTIONALLY LEFT BLANK

August 5, 2019

Sharon Meyer, Chairman
Bayview Water and Sewer District
PO Box 637
Bayview, ID 83803
BWSDSharonK@hotmail.com

RE: **Bayview Water and Sewer District, ID1280014,** Comments on the Bayview Water and Sewer District Water System Facility Plan, February 2019

Dear Ms. Meyer:

The Department of Environmental Quality (DEQ) has reviewed a water system facility plan study (FPS) for the Bayview Water and Sewer District (District). The FPS (P&S# 13988) was stamped and signed by Ellery Howard, P.E. on February 14, 2019 and submitted to DEQ on February 19, 2019. Major system components addressed by this facility plan include the wells, the storage reservoirs, and the distribution system.

This document was reviewed for its conformance with the Idaho Drinking Water Rules, IDAPA 58.01.08 Subsection 502 and other applicable subsections. The technical aspects described within the FPS appear to generally meet the applicable portions of IDAPA 58.01.08. The following concerns and comments must be addressed in a revised submittal:

1. Connections – Table 2-2, table 2-3 and table 2-4 contain different numbers for the current (2017) number of connections. Please verify which table(s) is/are correct. If calculations were based on an inaccurate number, please adjust those calculations in the remainder of the report.
2. Maximum Day Production – while 2015 was a hotter than normal year, this data is still valid for consideration. Meteorological data indicates weather patterns are producing increasingly warm summers and 2015 is not likely to be an anomaly. What was the maximum day during 2015-2017, not including fire flows? This number should be used for the flow projections.
3. Farragut Park Intertie – The text of the report (page 2-17) regarding the intertie with Farragut State Park states that the intertie cannot be used to serve water to the park, however during the May 16, 2019 board meeting it was noted that Bayview was currently serving water to the East end of the park. The Facility Plan needs to be updated to correct this.
4. Well Discharge piping – the discharge piping in both well houses is currently attached to torpedo casings. These do not meet DW standards. The wells currently have no mechanism to pump to waste. The report should include recommendations for controlling pressure transients, for pumping the wells to waste and any other well house improvements necessary.
5. Back-up power – inclusion of automatic switch over to backup power at Well 8 should be included as a possible improvement. How would the inclusion of backup power change the storage requirements?
6. Well Ownership – per IDAPA 58.01.08.512 the well lots should be controlled by the District via fee simple ownership or a lease for the useful life of the well. What are the District's plans to meet this

requirement?

7. Fire Flow Requirements – The requirements for fire flow must be documented by including a written statement from the Fire Chief.
8. Substandard pressures – A map identifying the low pressure areas should be included in the FPS. Were field measurements performed to verify the modeled low pressure areas? If so, this should also be included in the FPS. DEQ strongly recommends the District verify the pressures in these areas.
9. Storage tanks–
   a. Isolation – It is unclear from the narrative whether the storage tanks can be taken offline for maintenance and cleaning, as required by IDAPA 58.01.08.546.02. If they cannot be isolated, the proposed improvements must indicate a means to meet this requirement.
   b. Dromore tank – The water level control mechanism and coating conditions that are discussed in the report need to be confirmed through field observation and discussions with the system operator.
   c. Funding – DEQ funded improvements are required to have a useful life equal or greater to the term of the loan (30 years)
   d. Sizing – Not all of the tanks in the system are capable of serving water to all areas of the District. Was this considered in the storage calculations?
10. System Diagram – A line diagram of the system is a valuable tool for planning and operation of any system. One should be included in the report. If examples are desired, please let me know.
11. Sanitary Survey – The 2019 Sanitary Survey, and the deficiencies noted, should be included in the revised FPS submittal.
12. Capital Improvement Plan – A capital improvement plan with the system deficiencies and the recommended improvements to address them needs to be included in the report. The list should include indicators (such as time or population growth) for when the improvements will need to be completed.

Should you have any questions or require additional information, please do not hesitate to contact me at (208) 666-4640 or via e-mail at katy.baker-casile@deq.idaho.gov.

Sincerely,

Katy Rose Baker-Casile

Katy R. Baker-Casile, P.E.
Lead Drinking Water Engineer

KBC:sh

c: Paul Klatt, P.E. JUB Engineers pklatt@jub.com
Adam Oliver, DEQ State Office, adam.oliver@deq.idaho.gov
Tim Wendland, DEQ State Office, tim.wendland @deq.idaho.gov
MaryAnna Peavey, DEQ State Office, maryanna.peavey@deq.idaho.gov
Charlie Parkins, DEQ State Office, charlie.parkins@deq.idaho.gov
Suzanne Scheidt, DEQ DW Compliance Staff suzanne.scheidt@deq.idaho.gov
EDMS: 2019AGD4790

2110 Ironwood Parkway, Coeur d'Alene, ID 83814 (208) 769-1422

Brad Little, Governor
John H. Tippets, Director

May 7, 2020

Calvin Nolan, President
Bayview Water and Sewer District
P.O. Box 637
Bayview, ID 83803

RE: **Bayview Water and Sewer District, ID1280014,** Technical Approval of the Bayview Water and Sewer District Water System Facility Plan, February 2020

Dear Mr. Nolan,

The Idaho Department of Environmental Quality (DEQ) received the revised facility plan study (FPS) titled "Water System Facility Plan Bayview Water and Sewer District", which was signed and stamped on February 24, 2020. The FPS was submitted to DEQ on March 16, 2020 by Steve James, P.E. of J-U-B Engineers. The technical aspects described within the FPS were reviewed for compliance with IDAPA 58.01.08 and the Idaho DEQ Drinking Water Grant rules for Facility Plans. This letter constitutes DEQ's approval of the technical portion of the Facility Plan.

DEQ strongly encourages the District to address the critical infrastructure needs in a more timely fashion than is outlined in the Capital Improvement Plan. The insufficient pressure in the Dromore Area is a public health concern and leaving the issue unaddressed for ten to fifteen years does not protect public health. If the District does not address the low pressure and the leaking distribution mains in a timely fashion, the DEQ may seek a compliance agreement schedule to assist the District in achieving compliance more quickly.

The District must complete the state environmental review process (SERP) for this project before final approval of the Facility Plan can be issued and in order for the project to be eligible for DEQ State Revolving Loan Program funding. An environmental review scoping meeting has been held for this project; the District and the consulting engineer should continue to coordinate the environmental review portion of the project with DEQ Environmental Planner LaDonn Kaylor.

Please contact me at (208) 666-4640 or katy.baker-casile@deq.idaho.gov should you have questions or require additional information.

Sincerely,

Katy Rose Baker-Casile

Katy R. Baker-Casile, P.E.
Senior Drinking Water Engineer

KBC:am:km

c: Steve James, P.E. JUB Engineers sjames@jub.com
LaDonn Kaylor, DEQ State Office, ladonn.kaylor@deq.idaho.gov
Tim Wendland, DEQ State Office, tim.wendland @deq.idaho.gov
Charlie Parkins, DEQ State Office, charlie.parkins@deq.idaho.gov
Anna Moody DEQ DW Manager, anna.moody@deq.idaho.gov
Matt Plaisted, DEQ Engineering Manager matthew.plaisted@deq.idaho.gov
EDMS file: 2020AGD2166 (P&S 13988)

Appendix 4-C

Public Involvement Subsequent to IDEQ Technical Approval

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Testimony in regards to the BW&S Facility Plan before the Bayview Water and Sewer Board 5/30/2020

I'd like to begin by saying:
- This is not a condemnation of the current board only a note of caution.
- I support the need for upgrades and repairs.

It comes down to what the majority of Bayview ratepayers support and what is the fundamental fiduciary responsibility of those individuals entrusted to carrying out the WILL of the people.

I believe that WILL was made clear in the failure of the first two bonds and is easily defined as:

- We want Bayview to remain the quaint small town we know and love.
- We want it to remain affordable as a working class destination.
- Ratepayers should not be required to subsidize the loss of these qualities for the benefit of developers.

I supported the first bond, but after reading the BW&S Facility Plan and assessing of the public involvement process, I believe it to be a carefully crafted attempt to manipulate our community into subsidizing future development rather than serving the public health and fiscal wellbeing of the current ratepayers.

I come to this conclusion as a result of:

- Comparing the recent rehabilitation of the sister storage tank at Farragut State Park to the cost estimates in the BW&S Facility Plan.
- And reviewing **FEMA's *U.S. Fire Administration Water Supply Systems and Evaluation Methods*** guidelines for developing water systems.
- Both of which have lead me to believe we were being sold the proverbial "Pig in a Poke" in the form of a new tank and unnecessary 12" high volume water line. A "pig in a poke" is a thing that is bought without first being properly inspected.

A lack of basic knowledge of our system and its needs by JUB management.

- August 2019 BWSD Special Meeting, JUB engineer, Steve James, states that he didn't know our water tank and pumps were leased and not owned by the district. This is after running bond #2. Watch:
- https://www.youtube.com/watch?v=ftPNEkf3Mtg

Our district was torn apart by two failed bonds and a board recall as a direct result of the fundamental, perhaps intentional flaws in the process of selling us the BW&S Facility Plan <u>without showing it to us</u>.

- Because the PLAN was not properly designed to meet the will of the community.
- Anyone with the slightest community awareness should have known that we fiercely defend our small town.
- We have a long and storied history of doing so.
- The town responded and overwhelmingly cast no votes twice and a final vote of no confidence for the past board.
- Had JUB done their job, the job they were paid $45,000 to do, our community would have chosen to fix our system and work could have proceeded.

The utter failure on the part of JUB Engineering to utilize the recommendations provided by FEMA under the *U.S. Fire Administration* Water Supply Systems and Evaluation Methods would have resulted in the:

- Designing a safe, fiscally responsible plan for providing clean water and fire protection.
- Not building a massive new tank and requiring an unacceptable debt
- Is this a testament to incompetence or something else?

No discussion of the underlying costs to the community of a new tank, and a new high volume 12" water line.

- Who would ultimately profit from a new tank and a new high volume 12" water line.
- The impact on development and the long term cost to rate payers.
- The long term cost to rate payers for enabling the development of several hundred new water and sewer connections on undeveloped property.
- The potential development within the township of High-rise condominiums.
- No discussion of the longterm impact on our existing sewer system by enabling this type of development.
- No assessment of the limitations of our current sewer system and it's impact on the environment, specifically active springs in and around the sewer disposal area.
- Why water and sewer rates rise and become burdensome to districts nationwide and how to avoid ever escalating ratepayer costs.

Not developing an actual integrated fire preventing plan that would include effective, sustainable and fiscally responsible alternatives to the Fire Flow as defined in the FEMA document such as:

- Requiring businesses to subsidize their own fire protection, not rate payers.
- Inferring Fire Flow volume is a legal requirement rather than an option.
- Failing to reach out to other local, state or federal agencies for coordinated planning and cost sharing of fire protection.
- Failing to identify other alternative funding methods.
- No discussion of alternative fire **prevention** planning.
- No discussion of a fire prevention strategy that used the lake.

A manipulative public outreach process including:

- The intentional non-disclosure of the BW&S Facility Plan to the public throughout the so-called public outreach process. It was inadvertently uncovered just before the second vote
- An attempt to discourage a review of the plan by discounting its significance to the process.
- An attempt by the previous board and JUB to limit access to the documents. Stating the documents were: incomplete, too big to allow universal public access, that they resemble a high school essay, they can only be seen in the office of IDEQ. All of which were untrue.
- The use of fear tactics in the effort sell this plan as a means of protecting our community from wild fire when in fact according to FEMA conventional fire flow volumes will do little in the advent of a forest fire beyond giving us a false sense of security and are only adequate for conventional single fire events.
- The discovery of lower cost maintenance and upgrade procedures to greatly reduce water volume requirements for fire flow. These were acknowledged by the engineer and subsequently added to the plan but why did it take me pointing this out?
- This resembled collusion to defraud the community in my opinion.
- No workshops on the Facilities Plan.

No discussion of alternative funding sources.

- JUB engineer at the May 2020 meeting informs the Board of a Bureau of Reclamation grant that specifically funds water districts with leak problems. This is the first time this funding option has been offered. Why?

Designing a plan with massively inflated cost estimates through exorbitant engineering fees and cost overrun schedules that would have tripled the final costs to our community for any work done.

- The most important aspect of the planning process, the actual cost breakdown and comparisons were put in the appendixes.
- How do inflated cost structures financed by low interest rates compare to real cost estimates for work done without bureaucratic public private funding collusion.

Trying to push through electronic valve technology that is:

- Expensive and an unreliable maintenance headache
- Its software is prone to becoming obsolete

Rushing through the process forcing votes under the threat of loss of funding rather than being responsive to our communities needs and desires.

- The document itself is classic (PHD) Piled Higher and Deeper with the real meat bundled in multiple appendices that had to be requested even after it was determined that statutory requirements meant that this information be given to the public as it was being developed not after it was voted on.

Failure to include the lower cost crystalline tank rehabilitation option.

- Exorbitant cost estimates for rehabilitating our tank that failed to consider the higher quality, and significant cost savings of using crystalline concrete treatment options despite the fact that this is a long established technology for concrete restoration.
- This proven technology is a onetime treatment that does not require extensive downtime, is not prone to failure and does not require expensive exterior treatment.
- It is also INEXPENSIVE. I got a rough estimate of around $100,000
- Not including it in the document was beyond a simple oversight.

No consideration for implementing water conservation as an option.

- This should have been a prime consideration not even given lip service.
- No basic research or testing to determine the source of our lost water.

No public acknowledgement of the shortfalls of huge steel water tanks.

- They have maintenance headaches.
- They are not able to be rehabilitated easily if at all.
- Storing large volumes of treated water for fire flow is expensive and leads to water quality issues.

No serious attempt to address water pressure issues with reconfiguring our lines.

- Acting like Dromore pressure issue was the end of the world.
- This was particularly pushed by IDEQ.

The use of threats and intimidation by IDEQ against our community rather than working with us in a positive way to help us save money and provide services without taking on exorbitant debt.

- The failure by IDEQ to properly monitor the higher purpose of serving the rate payers of Bayview by reining in JUB and insisting they develop alternatives to prevent run away costs.
- Insisting that we were risking fines and shut down when in fact this is a last resort.
- Along with JUB's exit I IDEQ needs to appoint a new point person to work on our project as we have lost confidence in the current representative.
- The behavior by IDEQ was particularly disrespectful to our community in so many ways that I understand why people feel government is not their friend.
- We deserve an apology as a community for this treatment.

I personally believe this harkens back to the words of the infamous developer Bob Holland who was quoted as saying, "You people don't deserve this place!" Referring to the fact that many of us in Bayview are low to moderate income and Bayview deserves a higher class residents.

I'm certain the state tax collectors feel the same way, that Bayview has the potential to provide hundreds of millions of taxable property verses remaining the working class paradise we all know and love.

This was the reason I adamantly opposed the second bond and supported the subsequent recall of the previous board.

I have withheld judgment of the new board in hopes that they will do the right thing and truly live up to their fiduciary responsibility and take the time to insure we get the best deal possible. But if you, like the previous board ignore the will of the people and go forward with a new tank and 12 inch line to Perimeter Road you will have sold us all the the highest bidder.

I apologize for any errors, and trust me this is the last thing I want to be doing with my time. We have fought to try to keep Bayview affordable and preserve its unique character for decades. It is now in your hands, please do the right thing.

Mike Lee
Bayview Resident

Bayview
Water & Sewer District
P.O. Box 637 • Bayview, Idaho 83803-0637

June 15, 2020

Mr. Mike Lee
Via email response

Dr. Mike,

Thank you for the comments you forwarded to the Board on June 1st and also had presented, in part, at the Public Hearing on June 4, 2020. You give a lot of good information that we can share with our design engineer.

In order to move forward from the planning stage into the design stage:

) We will be engaging a new engineering firm as design engineer.
) Our approved capital improvement plan is not for a new tank. We will be rehabbing our existing tank.
) Capital improvements as defined in the areas of Supply, Storage, and Distribution, as set out in our summary of improvements for the selected project, will progress with the recommendations of our new design engineer and IDEQ requirements, as appropriate.

Our consideration of each element of the project will be to achieve the desired result in the most cost effective manner possible.

This Board does not have any intent to subsidize future development in Bayview, quite to the contrary, our rate structure requires both a water and sewer capitalization fee be paid for all new hook-ups. In addition, any future development within the boundaries of the district would require the developer to pay all costs of the necessary infrastructure.

This Board is dedicated to serving the public health and fiscal wellbeing of the ratepayers of BWSD.

Calvin Nolan
Chairman of the Board

Bayview Water & Sewer District

16401 E. Emerson Dr., Bayview, Idaho 83803

SPECIAL MEETING MINUTES

January 21, 2020

Call to Order and Roll Call: Chairman Calvin Nolan opened the meeting at 7:00 PM and a roll call confirmed that directors Ted Bare, Larry Leake, Jamee Stewart and Ross Besich were also present.

Others Present: District treasurer Jessie Roe.

Guests Present: Members of the public.

Approval of the Agenda: Mr. Bare motioned to approve the agenda followed by a second from Mr. Leake. All were in favor, motion carried.

Agenda Items:

1.) Discuss/Select Preferred Alternative for the Water Facility Plan: The Board reviewed the discussion from the meeting with JUB Engineers on January 16, 2020 amongst each other and the public. In order for the Water Facility Plan to proceed the Board must decide on a 'Preferred Alternative' to include in the plan and submit to Department of Environmental Quality (DEQ) before the facility plan can be presented to the members of the District and hold a Public Hearing. Chairman Nolan said that at the last meeting on January 16, 2020 Katy Baker-Casile with DEQ was present and told the Board the only two plans that satisfy all of DEQ's requirements to address the District's deficiencies outlined in the recent sanitary survey performed on April 11, 2019 would be option A or option E (attached). Picking the preferred alternative does not mean the Board has to go for a Bond for this project; it is simply a future plan to eventually address the system deficiencies outlined in the Sanitary Survey. If all the deficiencies are not addressed the District could face penalties and fines, and in a worse-case scenario, deemed as an unsanitary system and dis-approved. After much deliberation, Chairman Nolan motioned to approve Option E to go into the Water Facility Plan and be submitted to DEQ for review, followed by a second from Mr. Leake. Mr. Besich was in favor but Mr. Bare and Ms. Stewart were opposed. Majority has the vote, motion passed.

With no further business to discuss the special meeting was adjourned at 8:14 PM following a motion from Mr. Leake, seconded by Mr. Bare. All were in favor, motion carried.

Respectfully Submitted and Approved:

____________________________	____________________________
Jessie Roe	Calvin Nolan
Administrative/Treasurer	Chairman on the Board

BAYVIEW WATER AND SEWER DISTRICT
PO Box 637 Bayview, Idaho 83803

RESOLUTION NO. 2020-004

A resolution of the Board of Directors of Bayview Water and Sewer District, Kootenai County, Idaho to designate a preferred alternative project plan preceding the completion of the District Water Facility Plan to comply with Idaho Department of Environmental Quality (IDEQ) drinking water system compliance.

WHEREAS, Bayview Water and Sewer District, Kootenai County, Idaho (the "District" is a duly and properly formed water district under and by virtue of the constitution and laws of the State of Idaho and governed by an elected Board of Directors (the "Board"); and

WHEREAS, the District, in order to meet the Water Facility Planning process requirements of the Idaho Department of Environmental Quality, (IDEQ) must hold a Public Hearing to present the Preferred Alternative for the Capital Improvements Plan project as set out in the Water Facility Plan submitted to the IDEQ; and

WHEREAS, the preferred alternative selected and presented, is known as "Option E" in the Water Facility Plan document and has been approved by IDEQ to satisfy all of the requirements to address the District's deficiencies as set out in the sanitary survey performed on April 11, 2019; and

WHEREAS, the Board held the required Public Hearing and presented Option E as the preferred alternative for the Capital Improvements Plan on June 4, 2020, at which time the Board received and responded to public comments.

NOW, THEREFORE, BE IT RESOLVED, by the Board of Directors of Bayview Water and Sewer District as follows:

1. The Board formally selects Option E, as presented at the Public Hearing on June 4, 2020, to be the Preferred Alternative for the Capital Improvements Plan project in accordance with the Water Facility Plan requirements of IDEQ.
2. The Option E preferred alternative, as presented at the Public Hearing on June 4, 2020, shall be attached to and become a part of this resolution.

This Resolution shall become and is effective as of the date of its adoption.

DATED this 18th day of June, 2020.

BAYVIEW WATER AND SEWER DISTRICT,
Kootenai County, Idaho

Calvin Nolan, Chairman of the Board

ATTEST:

District Secretary

* * * * * * * * * * * * * * *

I, the undersigned, Secretary of the Board of Directors of Bayview Water and Sewer District, of Kootenai County, Idaho, hereby certify that the foregoing Resolution is a full, true, and correct copy of a Resolution duly adopted at a special meeting of the District, at the regular meeting place thereof on June 18, 2020, of which meeting all members of the Board had due notice and at which a majority thereof were present; and that at said meeting said Resolution was adopted by the following vote:

Directors:

Calvin Nolan, Chairperson	Aye X Nay ___ Absent ___ Abstain ___
Larry Leake, Vice Chair	Aye X Nay ___ Absent ___ Abstain ___
Ali Spahn	Aye X Nay ___ Absent ___ Abstain ___
Colleen Dahlseid	Aye X Nay ___ Absent ___ Abstain ___
Ted Bare	Aye ___ Nay X Absent ___ Abstain ___

STATE OF IDAHO)
) ss
County of Kootenai)

One this 18th day of June, 2020. I Jessie Roe certify that the following members of the Bayview Water and Sewer District, Calvin Nolan, Larry Leake, Ali Spahn, Colleen Dahlseid, and Ted Bare signed the forgoing document, willingly and freely in my presence and that the signatures are genuinely his/hers.

I further certify that I have carefully compared the same with the original Resolution on file and of record in my office; that said Resolution is a full, true, and correct copy of the original Resolution adopted at said meeting; and that said Resolution has not been amended, modified, or rescinded since the date of its adoption, and is now in full force and effect.

IN WITNESS WHEREOF, I have set my hand and affixed the official seal of the District on June 18th, 2020.

JESSIE L. ROE
COMMISSION NO. 69401
NOTARY PUBLIC
STATE OF IDAHO
MY COMMISSION EXPIRES 02/17/2023

Notary Public for the state of Idaho

Jessie Roe
Print name

ADOPTED by the Board of Directors this 18th day of June, 2020
BAYVIEW WATER & SEWER DISTRICT

Calvin Nolan, Chairman of the Board

SEAL

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Bayview Water and Sewer District
Water System Facility Plan

Existing Environmental Conditions of the Planning Area

PROFESSIONAL ENGINEER
REGISTERED
7768
6.26.20
STATE OF IDAHO
STEPHEN P. JAMES

June 2020

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Contents

Figures

Tables

Appendices

THIS PAGE WAS INTENTIONALLY LEFT BLANK

TM No. 5 – Existing Conditions

5.1 Purpose, Need, and Study Boundary

5.1.1 Purpose and Need

The District's public water system has various operational and capacity issues today and under potential future service conditions, as noted in Technical Memoranda No. 2 and No. 3. Items of significant concern include storage, system pressures at maximum day demand, and non-revenue water. Continued aging of components and increasing demands may impose additional stresses on the system and affect the District's ability to consistently meet demand and water quality criteria. Technical Memorandum No. 3 identifies potential improvements for the system based on existing identified deficiencies and Technical Memorandum No. 4 identifies various project alternatives to implement the recommended improvements. The District selected Alternative/Project as the preferred alternative. Discussion of the public participation process and selection of a final Alternative will be included in Technical Memorandum No. 4.

5.1.2 Study Boundary

The Bayview Water and Sewer District's (the District's) water service boundary comprises the Proposed Project Planning Area (PPPA), which is also the area of potential effect (APE), for any improvements to the District's potable water system. The overall District boundary, and the supply and storage tank locations are shown in **Figure 5-1.**

5.2 Existing Environmental Conditions in the Planning Area

Subsequent sections discuss existing environmental conditions for the area of potential effect for the recommended improvements to the District's potable water system.

5.2.1 Physiography, Topography, Geology, and Soils

The topography of the District generally slopes toward Lake Pend Oreille, from north to south in the northern part of the District and from south to north in the southern part of the District. Elevations range from Lake Pend Oreille's normal pool elevation of 2,062-feet above mean sea level (AMSL) to approximately 3,640-feet AMSL in the Dromore area. The majority of the district is below 2,400-feet AMSL. The lake has a 100-year (i.e., one-percent annual chance) base flood elevation of 2,070-feet AMSL. A topographical map is included in **Appendix 5-A**.

The District's service area has a varied and complex geologic history that created a unique geologic environment. Deposition of sands, silts, and mud in coastal waters during the Precambrian that were subject to cementation, consolidation, low-grade metamorphism, and other processes that resulted in the formation of rocks that are referred to as the Precambrian Belt Super Group. After forming, these rocks were subject to erosion, subsidence, and uplift.

Figure 5-1 – District Extents and Water System Service Area

Extensive faulting occurred during the Mesozoic Era. Faults represent planes of weakness and zones of stress transfer between tectonic provinces. Two major faults located in the surrounding area include the Hope Fault on the northeast side of Lake Pend Oreille and the Purcell Trench Fault. The Purcell Trench is a north-south trending fault that runs from north of the Canadian border to south of the Rathdrum Prairie, west of the District. Both faults have been active within the last 16 million years, and have had recent minor activity in the last few years, resulting in small earthquakes in the region. Maps showing Miocene Epoch and younger faults in Idaho, including the Hope Fault and Purcell Trench Fault, are included in **Appendix 5-A**.

During the Pleistocene Epoch, numerous glacial advances occurred in the study area. A thick Cordilleran ice sheet covered most of Northern Idaho, Montana, and Washington. The Purcell Lobe of the ice sheet covered the entirety of Lake Pend Orielle and the District during its maximum southern extension. The resulting ground moraine and fluvial outwash deposits settled in the Bayview area. These deposits consist of silt, sand, pebbles, cobbles, and boulders. During some of the advances of the Purcell Lobe, the ice blocked the westward flow of the Clark Fork River at the northeast end of Lake Pend Oreille. This resulted in the formation of glacial Lake Missoula. Sudden failures of the ice dam resulted in catastrophic flood events that caused significant changes in topography and the distribution of sediments throughout the region. During most of these flood events, the ice sheet that covered the study area protected the underlying sediments from flood-induced flows and prevented extensive reworking. Quarry pits for limestone have been developed in the area, but are no longer active. As the ice sheet receded, less severe flood events occurred. The sediments in the study area were not protected during these events, and flood deposits can be identified. These flood deposits make excellent sand and gravel sources, and quarry pits have been developed in this area to develop these resources. An active gravel/sand quarry is located approximately 0.4 miles west of the District’s service area. A geologic map for Kootenai County and a geological map of the Bayview and Lakeview Quadrangles are included in **Appendix 5-A**. Major geologic units in the area include:

- Qm – Lake Missoula Flood Deposits (Quaternary)
- Kgd – Granodiorite, fine to medium grained hornblende-biotite granodiorite (Cretaceous)
- E1 – Lakeview Limestone (Paleozoic)
- Qg – Glacial Deposits (Quaternary)
- Qtc – Talus and Colluvium (Quaternary)

According to the USDA Soil Conservation Service, majority soil classifications in the area include:

- Bonner gravelly silt loam, 0 to 8 percent slopes
- Kootenai gravelly silt loam, 20 to 45 percent slopes
- Caribouridge-Stein families, complex, outwash plains of mixed geology
- Highfalls-Pearsoncreek-Newbell families, complex, glaciated mountain slopes, belt geology, south aspects
- Highfalls-Pearsoncreek-Newbell families, complex, moderately steep glaciated mountain slopes, belt geology, south aspects

- Pepoon-Newbell families, rock outcrop complex, glaciated scoured ridges and upper mountain slopes, belt geology, south aspects
- Pearsoncreek-Marblecreek-Newbell families, complex, glaciated stream breaklands, metasedimentary belt geology
- Andic Humudepts-Humic Udivitrands-Pearsoncreek families, dense substratum complex, glaciated mountain slopes, granitic geology, south aspects

A soils map for the area is included in **Appendix 5-F**.

5.2.2 Surface and Groundwater Hydrology

Lake Pend Oreille is the main surface water body in the District's service area. The lake is fed by the Pack and Clark Fork Rivers and is drained by the Pend Oreille River. From Lake Pend Oreille, water flows to the Pacific Ocean via the Columbia River. Surface water quality is generally good.

The Spokane Valley – Rathdrum Prairie Aquifer is the main groundwater formation in the area and provides a high-quality water source for approximately 500,000 people in totality, beginning in the District, and underlying about 370 square miles of land in all. The aquifer was formed by sand and gravel deposition from ice age era Missoula floods. Groundwater flows trend generally west from the District toward the Athol area and then flow south towards Post Falls. The aquifer is recharged from surrounding lakes along the way and continues to flow west toward the Idaho-Washington state line. Depth to groundwater in the District ranges 80-220 feet in some areas. Some wells list a much lower static water level, but are likely under the influence of Lake Pend Orielle. The aquifer is designated as a Sole Source Aquifer as defined by the Idaho Department of Environmental Quality (IDEQ) and the U.S. Environmental Protection Agency (EPA). It is further listed by IDEQ as a sensitive resource aquifer, as no barrier limits or blocks the flow of surface water into the aquifer, which requires the strongest level of protection. The aquifer is described in detail in a 2005 report prepared by the U.S. Geological Survey (USGS) (Kahle and others, 2005) and the Spokane Valley-Rathdrum Prairie Aquifer Atlas (Boese and others, 2015).

5.2.3 Fauna, Flora, and Natural Communities

The Bayview area, in conjunction with neighboring Farragut State Park, provides valuable habitat for a variety of plant and animal species. Game animals most commonly found in the surrounding area include white-tailed deer, mule deer, wild turkey, Canadian geese, California quail, raccoon, American marten, moose, elk, and black bear. Other less common game species include snowshoe hare, spruce grouse, blue grouse, ruffed grouse, American beaver, bobcat, and mountain lion.

Lake Pend Oreille is also an important nesting area for ospreys and bald eagles. Peregrine falcon, wood duck, mallards, northern pintail, cinnamon teal, northern shoveler, gadwall, American wigeon, redhead, ring-necked duck, Barrow's goldeneye, hooded merganser, American coot, killdeer, great blue herons, belted kingfisher, doves, loons, hummingbirds, and owls are also found in the area. Numerous songbirds, shorebirds, other residential and migrating birds, small mammals, reptiles, and amphibians reflect the diverse habitat of the region. Lake Pend Oreille and its tributaries are also home to several fish species, including Kokanee salmon, rainbow trout, brook trout, lake trout, bull trout, northern pike, walleye, bass, bluegill, and perch.

The U.S. Fish and Wildlife Service (USFWS) lists plants and animals that are threatened or endangered for Idaho and specifically for Kootenai County (see **Appendix 5-B**). Listed species for Kootenai County include the following (Bonner county's listed species were not included here, as their listed animals' ranges do not overlap the District's):

- Candidate Species
  - North American Wolverine (*Gulo gulo luscus*)
- Threatened Species
  - Canada Lynx (*Lynx canadensis*)
  - Yellow-billed Cuckoo (*Coccyzus americanus*)
  - Spalding's Catchfly (*Silene spaldingii*)
  - Water Howellia (*Howellia aquatilis*)
- Threatened Species with Designated Critical Habitat
  - Bull Trout (*Salvelinus confluentus*)

A critical habitat map for Bull Trout in the Lake Pend Oreille area is also included in **Appendix 5-B**.

5.2.4 Housing, Industrial, and Commercial Development

The District's service area includes mostly residential land uses, a small number of commercial users, and no industrial connections. The District has a large seasonal population and many homes are only occupied during the summer months. Significant commercial and industrial development in the District is not anticipated. New homes are constructed periodically, but large residential growth is also not expected.

5.2.5 Cultural and Historic Resources

The Idaho National Register of Historic Places, included in **Appendix 5-C**, lists the Lake Pend Oreille Lime and Cement Industry Historic District as within in the District's boundaries. The lime kilns are located along the lake, off Pier Road, near the marina.

The nearest Native American territories to the District are the Kalispel Tribe of Indians Reservation to the north and the Coeur d'Alene Indian Reservation to the south. While Native Americans did historically camp near Scenic Bay (formerly named Squaw Bay), no known sites of Native American cultural significance are known to exist within the District.

The Idaho State Historic Preservation Office (SHPO) and various Tribes were consulted regarding the potential impacts to cultural and historic resources from the proposed improvements. Agency consultation is discussed in Section 5.3 of this Technical Memorandum.

5.2.6 Utility Use

Utility use is mainly by single-family residences with some commercial users. Utility providers for the District's service area are listed in **Table 5-1.**

Table 5-1 – Service Area Utility Providers

Utility	Provider
Sewer	Bayview Water and Sewer District
Water	Bayview Water and Sewer District Private Wells
Electricity	Kootenai Electric Cooperative
Gas	Avista Utilities

5.2.7 Floodplains and Wetlands

Any potential flooding in the District would be associated with Lake Pend Oreille, although flooding is rare due to lake level control provided by the Albeni Falls Dam on the Pend Oreille River northwest of the District. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) are included in **Appendix 5-D**

Wetlands in the District are generally small and are confined to the immediate vicinity of Bayview Creek and Lake Pend Oreille. Portions of Bayview Creek within the District have riverine and freshwater emergent wetland designations. A third of an acre freshwater pond connected to Bayview Creek exists to the northwest of the District. A U.S. Fish and Wildlife wetlands map for the District's is included in **Appendix 5-D**.

Potential system improvements are not anticipated to be located in wetland areas. Multiple alternatives involve new transmission pipeline in Perimeter Drive in the northeast portion of Bayview. This pipeline would likely cross Bayview Creek in the existing road prism between Merriweather Road and North Cherokee Road. The road is elevated above the Creek in this area and the Creek flows under the road in an existing culvert. The new pipeline would likely be installed above the existing culvert or, if bury depth was not sufficient, installed under the Creek via directional drilling. In either instance, impacts to the wetland area associated with Bayview Creek are not anticipated. Mitigation measures for potential impacts include stormwater best management practices (BMPs) to prevent erosion and runoff into the wetland and using alternate installation technologies, like directional drilling, to avoid direct excavation in the wetland area.

The wetlands information above and the map in **Appendix 5-D** are provided for general reference and do not constitute a wetlands determination. Data limitations of this mapping program are noted on the USFWS website (http://www.fws.gov/wetlands/data/limitations.html) and summarized below. Appropriate federal, state, or local agencies should be consulted for official wetlands determinations

- The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology, and geography. A margin of error is inherent in the use of imagery. Therefore, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

- Metadata should be consulted to determine the date of the source imagery used and any mapping problems.
- Wetlands or other mapped features may have changed since the date of the imagery and/or field work.
- Certain wetland habitats are excluded from the mapping program because of the limitations of aerial imagery, including seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters.

The U.S. Army Corps of Engineers was consulted regarding potential impacts to floodplains and wetlands from the proposed improvements. Agency consultation is discussed in Section 5.3 of this Technical Memorandum.

5.2.8 Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Wild and Scenic Rivers system has three categories:

1. Wild Rivers – Rivers that are free of dams, generally inaccessible except by trail, and represent vestiges of primitive America.
2. Scenic Rivers – Rivers that are free of dams with shorelines or watersheds still largely primitive and shorelines largely undeveloped but accessible in places by roads.
3. Recreational Rivers – Rivers that are readily accessible by road or railroad, may have some development along their shorelines, and may have been dammed in the past.

There are no creeks, streams, rivers, etc. in the vicinity of the District that have a Wild and Scenic designation. A map and list of designated Wild and Scenic Rivers in Idaho are included in **Appendix 5-E**.

5.2.9 Public Health and Water Quality Concerns

There are no major public health concerns in the District or surrounding area.

5.2.10 Prime Agricultural Farmlands

Prime farmland, as defined by the 1978 EPA Policy to Protect Environmentally Significant Agricultural Lands, has ideal characteristics necessary for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses. Preservation of these valuable lands is important for protecting wildlife habitat, reducing sediment and erosion, and improving water quality.

Much of the land surrounding the District are State Park and National Forest lands. Some small farms are located near the District. Dry land farming is the most common technique used. Areas in and around the District are not classified as Prime Farmland according to the USDA Soil Conservation Service. A map showing the types of soils located in the District is included in **Appendix 5-F**.

5.2.11 Sole Source Aquifers

The Spokane Valley/Rathdrum Prairie Aquifer underlies a portion of the District's service area, as shown on the Aquifer Map in **Appendix 5-G**. Classified by IDEQ as an unconfined (i.e., not overlain by a layer of impermeable rock), valley fill (i.e., found in an intermountain valley and composed on materials loosely deposited many years ago by air, water, or glacial activity) aquifer, it is also designated a "Sole Source Aquifer" by the EPA, as it supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. As the aquifer is the sole source of drinking water for the majority of residents within the District's service area, its protection is very important. Even though the aquifer lies 80 to 400 feet below the surface in Idaho, it is susceptible to contamination, as the overlying coarse sand and gravel offer limited protection from surface activities. In addition, all aquifer flow that is not pumped for use by the region's population recharges the Spokane River in Washington beginning approximately seven miles west of the Idaho border. Therefore, this aquifer is categorized as a Sensitive Resource Aquifer by IDEQ and requires the highest level of protection. A figure showing Sole Source Aquifers for EPA Region 10 is included in **Appendix 5-G**.

5.2.12 Land Use and Development

The District's service area contains mostly residential land uses with a small amount of commercial uses, generally concentrated along Main Street and the lakefront. Significant commercial development beyond what currently exists in the District is not anticipated. New homes are constructed periodically, but large residential growth is also not expected inside the District boundaries.

In areas surrounding the District (e.g., Athol and Spirit Lake), future economic development and residential growth is expected to be strong. Currently, there is demand for commercial and residential growth in the region. There is currently a large amount of undeveloped property along the major north-south corridor (Highway 95) that runs through the Athol area. Regional commercial growth is more likely to occur along this corridor near supporting cities. The surrounding areas contain large areas of timbered land, offering potential for development.

5.2.13 Precipitation, Temperature, and Prevailing Winds

Climatic data for the area is available from a weather station in Bayview via the Western Regional Climate Center (WRCC). A summary of this data is provided in **Table 5-2** and more detailed information is included in **Appendix 5-H**. The District typically has warm mild summer temperatures in the valley and cooler temperatures in the surrounding peaks and mountains. Winter temperatures are typically cold with more moderate snowfall than much of the surrounding area.

According to the WRCC, the Sandpoint Airport is the nearest location to the District's service area that has recorded wind speed and the Coeur d'Alene Airport is the nearest location with prevailing wind direction information. Generally, prevailing winds are northern winds during the growing season, and southwestern winds in the winter. Winds across the District are typically mild, with occasional strong winds. Average wind speed, in miles per hour, from the Sandpoint Airport is listed in **Table** 5-3. Raw data from the WRCC is included in **Appendix 5-H**.

Table 5-2 – Bayview Climate Summary [(a)]

Month	Monthly Average Temperatures (° F)		Average Total Precipitation	Average Total Snowfall	Average Snow Depth
	Maximum	Minimum	(inches)	(inches)	(inches)
January	34.8	21.3	2.91	14.2	4
February	38.9	23.8	2.06	5.1	3
March	45.5	27.0	2.13	2.7	1
April	54.5	32.2	1.77	0.2	0
May	64.0	38.3	2.03	0.0	0
June	71.3	44.8	1.89	0.0	0
July	79.9	48.7	0.94	0.0	0
August	79.1	47.6	1.02	0.0	0
September	68.9	40.7	1.18	0.0	0
October	55.3	33.2	2.10	0.1	0
November	42.8	28.0	3.07	3.1	0
December	35.9	23.0	3.10	11.7	2
Annual Average	55.9	34.0	2.02	N/A	1
Annual Average Total	N/A	N/A	24.2	37.1	N/A

[(a)] *Western Regional Climate Center; Bayview, Idaho; Period of Record 04-01-1947 to 06-10-2016*

Table 5-3 – Sandpoint Airport Wind Speed Data (2003-2006)

Month	Average Speed (mph)	Month	Average Speed (mph)
January	4.8	July	4.1
February	4.2	August	3.6
March	4.6	September	3.4
April	5.1	October	3.9
May	5.0	November	4.9
June	4.9	December	4.2
Average Annual Wind Speed		4.4	

5.2.14 Air Quality and Noise

The EPA has developed standards for monitoring and protecting air quality under the Clean Air Act as Amended in 1990. IDEQ is responsible for implementing, monitoring, and enforcing the air quality standards in the State of Idaho. An area that exceeds the air quality standards is considered to be a "non-attainment area" (NAA) for a particular component or for total air quality. The District is not within a non-attainment area. A copy of the Idaho Air Quality Planning Areas Map has been included in **Appendix 5-I**.

High noise levels are generally not present in the District's service area.

5.2.15 Energy Production and Consumption

Energy production sources for the Bayview area include hydroelectric and solar. The Albeni Falls Dam is located approximately 27 miles west of Sandpoint in Old Town, Idaho on the Pend Oreille River. The dam produces hydroelectricity, and additionally provides flood control during spring runoff.

A majority of the population in the Bayview area consume energy in the form of electricity. Natural gas, and wood are also utilized as primary heat sources in some households.

5.2.16 Socioeconomics

The economy of the District is largely seasonal, and service based. Restaurants and marinas are the largest local employers. Many of the businesses operate only during summer months, while a few remain open year-round. Bayview is a satellite community of both the Sandpoint and Coeur d'Alene metropolitan areas, with many residents commuting to the cities for work.

The population in the 83803 ZIP code in 2010 was 744 people, with 51.7 percent male and 48.3 percent female. The median age is 58.1 and 57.7 for the male and female populations, respectively. The majority race in the 83803 ZIP code is White (98.7 percent). The average household size is 1.91. The median household income is not listed (although a mean household income of $81,820 is listed) and median house value is $326,400. American Community Survey 5-Year Estimates for 2012 through 2016 indicate 510 persons in labor force and 52.2 percent (±32.6 percent margin of error) of individuals below the poverty level. Additional information from the U.S. Census Bureau and American Community Survey 5-Year Estimates is included in **Appendix 5-J**.

For comparison, the population in Kootenai County in 2010 was 138,494 people, with 49.3 percent male and 50.7 percent female. The median age is 37.7 and 40.0 for the male and female populations, respectively. The majority race in Kootenai County is White (94.5 percent). The average household size is 2.53 people. The median household income is $50,924 and median house value is $193,300. American Community Survey 5-Year Estimates for 2012 through 2016 indicate 71,357 persons in the Kootenai County labor force and 9.5 percent (±1.2 percent margin of error) of individuals below the poverty level. Additional information from the U.S. Census Bureau and American Community Survey 5-Year Estimates is included in **Appendix 5-J**.

5.3 Agency Consultation

5.3.1 IDEQ Environmental Review

IDEQ provided preliminary environmental review comments for the Facility Plan per a letter from Adam Oliver dated March 29, 2019, included in **Appendix 5-L**. J-U-B's responses to the review comments via letter dated March 13, 2020 are also included in **Appendix 5-L**. IDEQ's comments have been addressed in this version of the Facility Plan.

5.3.2 Agency Consultation

Table 5-4 lists the agencies consulted during the preparation of the Facility Plan as directed by IDEQ in their March 29, 2019 letter from Adam Oliver. Copies of agency consultation letters and responses received are included in **Appendix 5-K**. Communication with IDEQ is included in **Appendix 5-L**.

Table 5-4 – Agency Consultation List

Agency	Contact	Address	Consultation Conducted By	Date Consulted	Date Response Received
U.S. Army Corps of Engineers Coeur d'Alene Regulatory Office	Shane Slate	1910 Northwest Blvd., Ste. 210 Coeur d'Alene, ID 83814 shane.p.slate@usace.army.mil	J-U-B	3-22-2019	No Response Received
Idaho State Historical Society State Historic Preservation Office	Ashley Brown Elizabeth Witkowski	210 Main Street Boise, ID 83702 ashley.brown@ishs.idaho.gov	J-U-B	3-22-2019	4-4-2019
Coeur d'Alene Tribe of Idaho	Dr. Jill Wagner	P.O. Box 408 Plummer, ID 83851	IDEQ	3-28-2019	No Response Received
Confederate Salish & Kootenai Tribes	Marcia Pablo	P.O. Box 278 Pablo, MT 59855	IDEQ	3-28-2019	No Response Received
Kalispel Tribe	Kevin Lyons	P.O. Box 39 Usk, WA 99180	IDEQ	3-28-2019	No Response Received
Kootenai Tribal Council	Josie Shottanana	P.O. Box 1269 Bonners Ferry, ID 83805	IDEQ	3-28-2019	No Response Received

Agency response to the consultation requests was limited. The response from SHPO will be discussed in a subsequent section. As noted in previous sections, the proposed improvements are not anticipated to have adverse, long-term negative impacts on the existing environmental and cultural resources in the District.

5.3.3 SHPO Agency Consultation Response

The Idaho State Historical Society SHPO provided a response to requests for agency consultation in a letter from Elizabeth C. Witkowski dated April 4, 2019. The letter indicates the following concerns with the proposed improvements:

Based on the information received 25 March 2019, our office is concerned the proposed project actions may have the potential to affect historic properties. The Area of Potential Effect (APE) has been utilized historically and is in close proximity to water (Lake Pend Oreille). Our office recommends a cultural resources inventory be conducted of the APE. This survey should be conducted by an individual or firm meeting the Secretary of the Interior's Professional Qualifications for archaeology and architectural history. The report should indicate the height of the new water storage tank and any potential direct or indirect visual effects to local historic properties.

The main challenge with addressing the comments from SHPO is that the exact projects to be undertaken by the District and the location for a potential new storage reservoir are unknown, which makes scoping a cultural resources survey (CRS) difficult. Conducting a CRS now would require an overly-broad study area.

Discussions with IDEQ (e-mails and phone log notes included in **Appendix 5-L**) indicate that the District needs to honor SHPO's comments and conduct a CRS when the extent of proposed improvements is known. In the interest of completing the Facility Plan, IDEQ indicated that a conditional environmental determination could be issued for the final Alternative/Project and the Facility Plan. The District will still be required to complete the CRS, but the study can be completed as part of the project-specific design and construction process as opposed to now during the planning process. This allows the Facility Plan to be finalized and for the District to close their planning grant with IDEQ.

5.4 Public Participation

Public participation for the selected Alternative/Project is included in Technical Memorandum No. 4.

5.5 Agency Approval

Final approval from IDEQ can be found in **Appendix 5-L**.

References

Boese, R., Stevens, G., Hess, A., Jenkins, J., Barlow, R., Clary, A., Covert, J., Ekins, J., Galante, M., Hanson, T., Laumatia, L., LaScuola, M., Lindsay, R., Philips, S., and Schmidt, L. *The Spokane Valley-Rathdrum Prairie Aquifer Atlas.* Idaho Department of Environmental Quality. June 2015. <https://www.deq.idaho.gov/media/60178665/rathdrum-prairie-aquifer-atlas.pdf>. Retrieved October 1, 2018.

Digital Atlas of Idaho. Geologic Maps of Idaho. Kootenai County. <http://imnh.isu.edu/digitalatlas/counties/geomaps/geomap.htm> Retrieved September 27, 2018.

Doughty, P.T., Price, R.A., and Parrish, R.R., 1997, Geology and U-Pb geochronology of Archean basement and Proterozoic cover in the Priest River complex, northwestern Unite States, and their implications for Cordilleran structure and Precambrian continent reconstructions: Canadian Journal of Earth Science, v. 35, p. 39-54.

Federal Emergency Management Agency. Map Service Center – Kootenai County, Idaho Unincorporated Areas Flood Insurance Rate Map 16055C0125E. <http://www.fema.gov/>. Retrieved September 28, 2018.

Federal Emergency Management Agency. Map Service Center – Bonner County, Idaho Unincorporated Areas Flood Insurance Rate Map 16017C1400E. <http://www.fema.gov/>. Retrieved September 28, 2018.

Groves, C.R., Butterfield, B., Lippincott, A., Csuti, B., and Scott, J.M. *Atlas of Idaho's Wildlife Integrating Gap Analysis and Natural Heritage Information*. Idaho Department of Fish and Wildlife. 1997. <https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm9_019219.pdf>. Retrieved October 2, 2018.

Hood, Desireé. Quakes Shake from Purcell Trench Fault. <http://www.cdapress.com/archive/article-84670da7-7ed0-5cd9-87e7-9647b047d338.html>. Hagadone News Network. Retrieved October 2, 2018.

Huseland, Herb. Bayview Stays Afloat Amid Changing Times. <http://www.spokesman.com/stories/2010/apr/25/bayview-stays-afloat-amid-changing-times/> The Spokesman-Review. Retrieved October 3, 2018.

Idaho Department of Education. Federal Lands and Indian Reservations Map. <https://www.sde.idaho.gov/indian-ed/files/general/Idaho-Reservation-Map.pdf>. Retrieved October 2, 2018.

Idaho Department of Environmental Quality. Idaho Air Quality Planning Areas Map. <http://www.deq.idaho.gov/air-quality/monitoring/attainment-versus-nonattainment/>. Retrieved September 28, 2018.

Idaho Department of Environmental Quality. Rathdrum Prairie Aquifer. <http://www.deq.idaho.gov/regional-offices-issues/coeur-dalene/rathdrum-prairie-aquifer/>. Retrieved October 1, 2018.

Idaho Department of Environmental Quality. Sole Source Aquifers. <http://www.deq.idaho.gov/water-quality/ground-water/sole-source-aquifers.aspx>. Retrieved September 28, 2018.

Idaho Department of Fish and Game. Bald Eagles in Idaho. <https://idfg.idaho.gov/old-web/docs/wildlife/nongame/leafletEagle.pdf>. Retrieved October 3, 2018.

Idaho Department of Fish and Game. Idaho Species. <https://idfg.idaho.gov/species/>. Retrieved on October 3, 2018.

Idaho Department of Water Resources. Well Construction and Drilling, Find a Well. <https://idwr.idaho.gov/wells/find-a-well.html>. Retrieved October 3, 2018.

Idaho Geological Survey. Geologic Map of Bayview, Idaho. <https://www.idahogeology.org/product/t-12-3>. Retrieved September 29, 2018.

Idaho Geological Survey. Miocene and Younger Faults in Idaho. <https://www.idahogeology.org/product/m-8>. Retrieved September 28, 2018.

Kahle, S.C., Caldwell, R.R., and Bartolino, J.R. *Compilation of Geologic, Hydrologic, and Ground-Water Flow Modeling Information for the Spokane Valley- Rathdrum Prairie Aquifer, Spokane County, Washington, and Bonner and Kootenai Counties, Idaho.* United States Geologic Survey Scientific Investigations Report 2005-5227. 2005.

Meier, Dannis. M-220-02 Farragut State Park, Staff Analysis Suporting Reuse Permit Issuance, Executive Summary. <http://www.deq.idaho.gov/media/60179094/farragut-state-park-kootenai-county-ww-analysis-0916.pdf>. Idaho Department of Environmental Quality. July 2016. Retrieved October 3, 2018.

MyTopo. Topographic Map. <http://www.mytopo.com/index.cfm>. Retrieved September 27, 2013.

The National Register of Historic Places in Idaho. Idaho State Preservation Office (SHPO). <https://history.idaho.gov/wp-content/uploads/2018/07/NRHP_Idaho.pdf>. Retrieved September 28, 2018.

National Weather Service. Advanced Hydrologic Prediction Service. <https://water.weather.gov/ahps2/hydrograph.php?wfo=otx&gage=hopi1>. Retrieved October 1, 2018.

U.S. Fish and Wildlife Service. National Wetlands Inventory. Wetlands Mapper. <https://www.fws.gov/wetlands/Data/Mapper.html>. Retrieved September 28, 2018.

United States Census Bureau. 2012 Quick Facts for Kootenai County, Idaho. <https://www.census.gov/quickfacts/fact/table/kootenaicountyidaho/PST045217>. Retrieved October 1, 2018.

United States Census Bureau. American Fact Finder. <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>. Retrieved October 3, 2018.

United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>. Retrieved September 28, 2018.

United States Fish and Wildlife Service. Bull Trout Final Critical Habitat for Bull Trout Unit:31. <https://www.fws.gov/pacific/bulltrout/finalcrithab/index.cfm?unit=31>. Retrieved September 28, 2018.

United States Fish and Wildlife Service. IPaC Information for Planning and Consultation. Threatened and Endangered Species for Kootenai County, Idaho. <https://ecos.fws.gov/ipac/location/index>. Retrieved September 28, 2018.

Western Regional Climate Center. Prevailing Wind Direction. <https://wrcc.dri.edu/Climate/comp_table_show.php?stype=wind_dir_avg>. Retrieved September 28, 2018.

Western Regional Climate Center. Average Monthly Wind Speeds (MPH). <https://wrcc.dri.edu/Climate/comp_table_show.php?stype=wind_speed_avg.2001-2011>. Retrieved September 28, 2018. <http://www.wrcc.dri.edu/wrccpub/climatedata/climtables/westwind> Retrieved April 8, 2015.

Western Regional Climate Center. Climate Summary for Bayview, Idaho. <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?id0667>. Retrieved September 28, 2018.

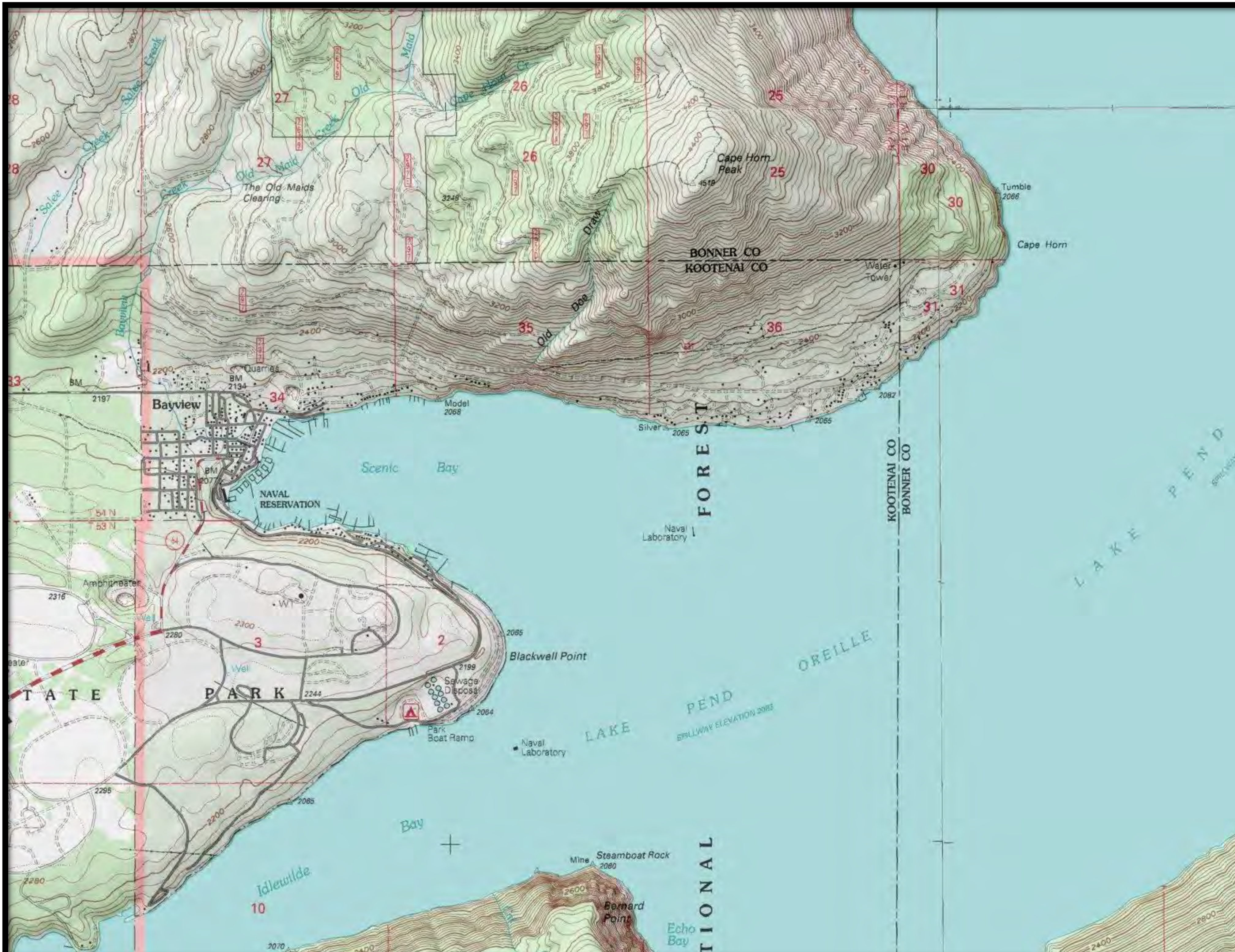
Wild and Scenic Rivers. National Wild and Scenic Rivers System. <http://www.rivers.gov, https://www.rivers.gov/mapping-gis.php>. Retrieved September 28, 2018.

Appendices (reference attached disk)

Appendix 5-A

Topographical, Geological and Fault Maps

THIS PAGE WAS INTENTIONALLY LEFT BLANK


Salee Creek
Old Maid Creek
Cape Horn Cr.
The Old Maids Clearing
Cape Horn Peak
4519
3248
Old Doe Draw
Tumble
2066
Cape Horn
BONNER CO
KOOTENAI CO
Water Tower
Bayview
BM 2197
BM 2134
Quarries
BM 2077
Model
2068
Silver
2065
2082
Scenic Bay
NAVAL RESERVATION
T 54 N
T 53 N
54
Naval Laboratory
FOREST
NATIONAL
KOOTENAI CO
BONNER CO
LAKE PEND OREILLE
SPILLWAY ELEVATION 2063
Amphitheater
2316
Well
2280
2300
2085
Blackwell Point
2199
Sewage Disposal
2244
2064
STATE PARK
Park Boat Ramp
Naval Laboratory
2295
2065
2200
Bay
Idlewilde
Mine
Steamboat Rock
2060
Bernard Point
Echo Bay
2070
2400
2600
2800
3000
3200
3400
3800
4200
4400
27
26
25
30
31
28
33
34
35
36
3
2
10

Geologic Map of the Bayview and Lakeview Quadrangles, Kootenai and Bonner Counties, Idaho

James L. Browne

2012

Base maps scanned from USGS digital raster graphic, Bayview 1967, and Lakeview 1961.

Bayview topography by photogrammetric methods from aerial photographs taken 1958 and planetable surveys 1961. North half and southwest corner revised from aerial photographs taken 1965 and 1966. Field checked 1967.

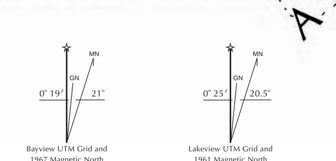
Lakeview topography by photogrammetric methods from aerial photographs taken 1958. Field checked 1961.

UniversalTransverse Mercator projection.

1927 North American Datum.

10,000-foot grid ticks based on Idaho coordinate system,west zone.

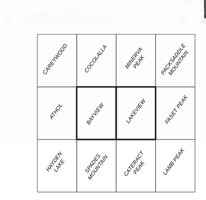
1000-meter Universal Transverse Mercator grid ticks, zone 11.



SCALE 1:24,000

Contour interval 40 feet
Dotted lines represent 20-foot contours (Bayview only)

QUADRANGLE LOCATION



ADJOINING QUADRANGLES

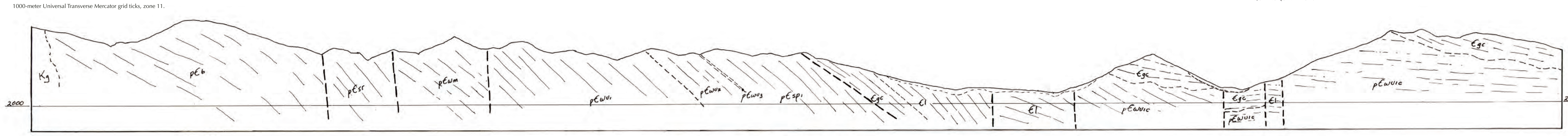
Field work conducted 2006.

Digital cartography by Jane S. Freed at the Idaho Geological Survey's Digital Mapping Lab.

Map version 7-10-2011.

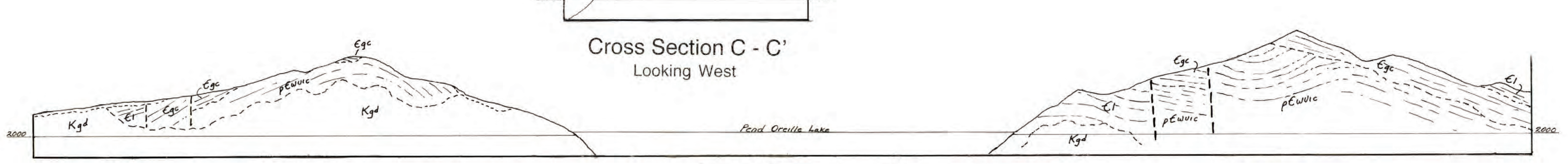
PDF (Acrobat Reader) map may be viewed online at idahogeology.org.

This Technical Report is a reproduction of independent mapping by James L. Browne of Coeur d'Alene, Idaho. Its content and format may not conform to agency standards.



Cross Section A - A' Looking Northwest

Cross Section C - C'
Looking West



Cross Section B - B' Looking North

Description of Map Units

Quaternary

Qal Alluvium -- Recently deposited clay, silt, sand and pebbles in valley floors.

Qtc Talus and Colluvium -- Large talus slopes mainly composed of Gold Creek quartzite; mainly Lakeview Limestone in Bayview area.

Qm Lake Missoula Flood Deposits --Outwash sand, pebbles, cobbles and boulders resulting from failure of Lake Missoula ice dams.

Qg Glacial Deposits -- Glacially deposited silt, sand, pebbles, cobbles and boulders.

Tertiary

Tog Old Gravel -- Tan to orange clay, silt, sand, gravel and cobbles filling Tertiary stream valley. Consists of mixed granodiorite and Belt metasediment material.

Cretaceous

Kgd Granodiorite -- Fine- to medium-grained hornblende-biotite granodiorite.

Kg Granite -- Fine- to medium-grained biotitic and porphyritic granite on Chilco Mountain. Orthoclase phenocrysts to 3/4 inch in length. Irregular granitized contact with Burke Formation quartzite on east side. Also as very thin dikes (not shown on map) cutting granodiorite in south center of Sec. 22 (T53N, R2W) near power line and other nearby areas.

Kgdg Granodiorite -- Fine-grained granodiorite (?) that contains muscovite and biotite. Porphyritic and heavily biotitic in places. Contains pyrite near Vulcan Mine. May contain and/or grade into granitized Lakeview Limestone.

Paleozoic

Єl Lakeview Limestone -- Light gray to gray and dark gray, finely crystalline limestone, dolomitic limestone and marble. Contains dark gray to nearly black shaley layers in places. Weathers almost white, especially where recrystallized in the Bayview area.

Єgc Gold Creek Quartzite -- White to pink, medium- to coarse-grained and grit-size, rounded to angular-grained quartzite. Few conglomeratic layers with pebbles to 1/2 inch. Few layers of maroon and little green siltite and fine-grained quartzite. Pink color due to very fine hematite, which is concentrated enough in places to cause a noticeable increase in specific gravity of selected specimens.

Precambrian Belt Supergroup

pЄsp₁ Striped Peak Formation Unit 1 -- Tan to green and red, thin- to medium-bedded micaceous quartzite with thin-bedded green, purple, and red siltite and argillite. Little tan quartzitic carbonate.

Wallace Formation

pЄwu₃ Upper Wallace Unit 3 -- Dark gray to black argillite laminated with light gray to gray siltite. Weathers readily. Exposures scarce.

pЄwu₂ Upper Wallace Unit 2 -- Very thin-bedded, gray-green to dark gray and black argillite laminated with light gray to gray siltite and quartzite and tan-weathering silty carbonate.

pЄwu₁ Upper Wallace Unit 1 -- Very thin-bedded, gray-green to mainly dark gray and black argillite laminated with light gray to gray siltite and quartzite.

pЄwu₁ Upper Wallace Unit 1 -- Gray-green argillite with irregular layers of fine-grained gray quartzite, poorly laminated in places, almost fissile in places. Only a few exposures show gray and dark gray argillite laminated with gray siltite, which is the main difference from the Upper Wallace Unit 1 exposures described above. Metamorphosed to coarse "sandy" appearance with unidentified dark mineral knots in Cape Horn Peak area. Probably equivalent to Argillite of Howe Mountain as mapped in Clark Fork area and in Cocolalla quadrangle north of Bayview.

pЄwu₁h Upper Wallace Unit 1 Hornfels -- Upper Wallace Unit 1 strata metamorphosed to hornfels.

pЄwm Middle Wallace -- Thin- to medium-bedded, gray to light gray and white quartzite, rusty-weathering dolomitic quartzite grading to quartzitic dolomite, green argillite and, especially in the lower part of the member, black argillite caps up to 3 inches thick over the quartzite-dolomitic quartzite-green argillite sequences. Pinch-and-swell texture common. Black argillite caps have contorted fractures filled with sand and silt from overlying units. Green argillite more prevalent in upper part of unit.

pЄwmh Middle Wallace Hornfels -- Middle Wallace strata metamorphosed to hornfels.

pЄwl₃ Lower Wallace Unit 3 -- Thin- to medium-bedded, light gray to gray quartzite, dolomitic quartzite grading to quartzitic dolomite, and abundant green argillite. Few thin black argillite caps. Dolomitic quartzite and quartzitic dolomite are dominant constituents in most places.

pЄwl₂ Lower Wallace Unit 2 -- Thin- to medium-bedded, light gray to gray quartzite, rusty-weathering dolomitic quartzite grading to quartzitic dolomite, and little green argillite. Abundant and prominent black argillite caps. Similar to Middle Wallace, except that quartzitic dolomite is present in greater quantity than in most Middle Wallace exposures.

pЄwlh Lower Wallace Hornfels -- Lower Wallace strata (undivided) metamorphosed to hornfels.

pЄsr St. Regis Formation -- Thin- to very thin-bedded, green and purple argillite with green siltite and gray to tan and greenish impure quartzite. Quartzite is especially prominent in the lower one-third of the formation, where it is more abundant than argillite or siltite and in places becomes medium- to thick-bedded. Rusty-weathering dolomitic argillite common in upper one-half to one-third of formation with wisps and very thin beds of argillitic dolomite occurring in the uppermost part of the formation. Top of unit placed at lower contact of prominent dolomitic quartzite/quartzitic dolomite beds of the overlying Lower Wallace. Thin bed of "waxy" green argillite also present in some areas at this contact.

pЄsrh St. Regis Formation Hornfels -- St. Regis strata metamorphosed to hornfels.

pЄb Burke Formation -- Thin- to thick-bedded, gray and dark gray to greenish, subvitreous siltite and fine grained quartzite with abundant argillite and siltite-argillite, especially in the lower one-third. Contains numerous layers of quartzite, which in a few beds resembles vitreous Revett quartzite in the upper one-third to one-half of the formation. The top of the Burke is placed at the bottom of thick beds of vitreous white quartzite.

Symbols

Contact, approximately located

Contact, concealed

Fault, approximately located

Fault, concealed

Strike and dip of beds

inclined vertical

Individual outcrop, road exposure or diagnostic rubble

References

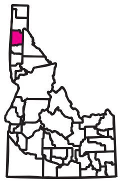
Burmester, R.F., R.M. Breckenridge, R.S. Lewis, and M.D. McFaddan, 2004b, Geologic Map of the Clark Fork quadrangle, Bonner County, Idaho, Idaho Geological Survey Web Map 25, scale 1:24,000

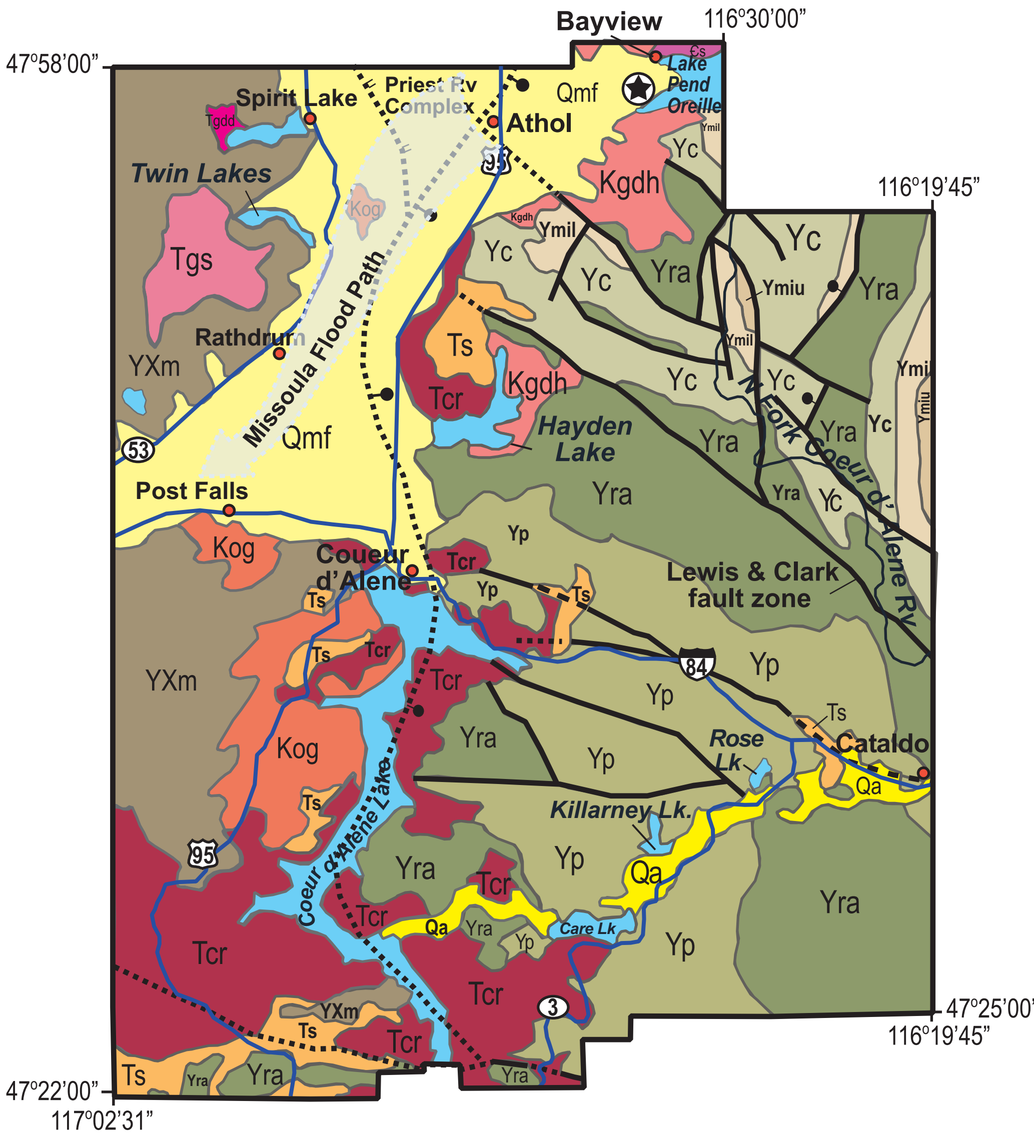
Burmester, R.F., R.S. Lewis, M.D. McFaddan, R.M. Breckenridge, D.M. Miller, and F.K. Miller, 2007, Idaho Geological Survey Web Map 91, scale 1:24,000

Kun, Peter, 1970, Geology of the Lakeview Mining District, Idaho, University of Idaho M.S. Thesis, 135 p.

Published and sold by the Idaho Geological Survey
University of Idaho, Moscow, Idaho 83844-3014

Kootenai County,
Idaho





0 5 10 miles

0 8 16 kilometers

1:500,000

Kootenai County

The bulk of Kootenai County south and east of Coeur d'Alene is underlain by Mesoproterozoic Belt Supergroup rocks continuing west from their extensively mineralized area along the Lewis and Clark fault zone, in the Silver Valley in Shoshone County.

The western part of the county, west of Coeur d'Alene Lake and the Rathdrum Prairie belongs to the lower plate of the Priest River core complex. The normal fault bounding the uplifted metamorphic rocks of the core complex dips eastward and follows the north-trending basin of Lake Coeur d'Alene.

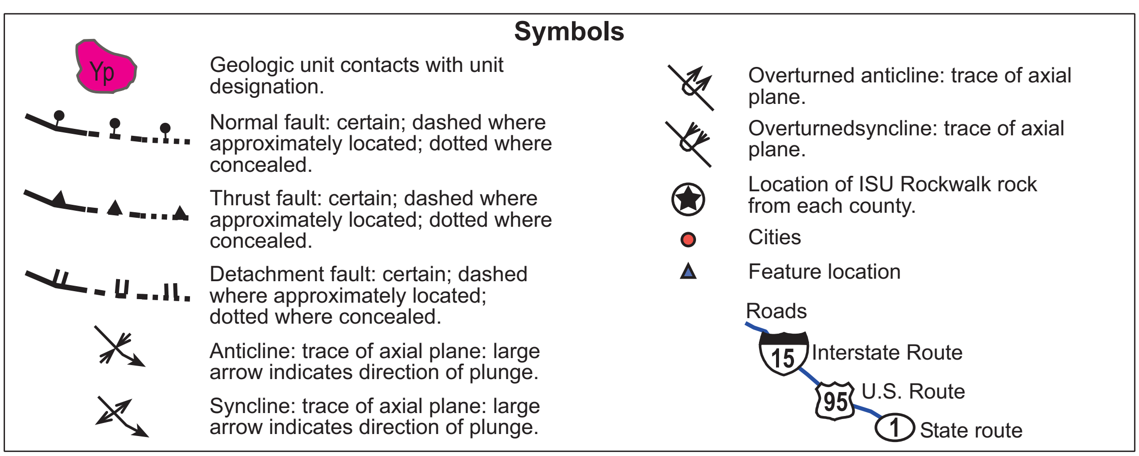
The south fork of the Coeur d'Alene River contains mining wastes from the Silver Valley. The area near Rose and Killarney Lakes as well as at Cataldo, contains a layer of zinc and lead-rich gravel or tailings, in the shallow subsurface. When the lake level changes these mine wastes are disturbed and metals may be released into solution. This is an ongoing scientific, political, and economic challenge.

The Lake Missoula Floods charged southwestward down the Rathdrum Prairie toward Post Falls, and into the Spokane River in eastern Washington.

Miocene Columbia River basalts cover the rolling Palouse country of the southwestern part of the County, north of the Coeur d'Alene Tribal Casino.

Cretaceous intrusive rocks are found in the core of the Priest River uplift south of Coeur d'Alene, and northeast of Hayden Lake. Eocene granitic rocks intrude the core complex west of Spirit Lake.

Written by P.K. Link, 9/02



Description of Units for Kootenai County, Idaho

Unit	Description
Qa	Quaternary alluvial deposits
Qmf	Missoula Flood deposits; boulder bars and gravel along route of Missoula flood on Rathdrum Prairie south and west of Lake Pend Oreille.
Ts	Tertiary sedimentary rocks, undifferentiated. Includes Oligocene and Eocene sedimentary rocks in east-central Idaho (Paleogene basins of Janecke). In northern and western Idaho this unit contains Miocene lake and stream deposits formed adjacent to and above the Columbia River and Weiser basalts, which formed dams in stream canyons.
Tcr	Miocene basalt (Columbia River Basalt Group); flood basalt, extensively exposed in western Idaho; fed by fissures, many of which are near the Idaho-Oregon border. Flowed eastward up valleys cut into the Idaho mountains.
Tgdd	Eocene granodiorite and dacite porphyry intrusive, also includes diorite and, in northern Idaho, minor granitic rock; intermediate phase of Challis magmatic event (50 to 46 Ma). Summit Creek stock.
Tgs	Eocene granite, pink granite, syenite, rhyolite dikes, and rhyolitic shallow intrusive; last phase of the Challis magmatic event (46 to 44 Ma). Forms craggy scenic mountain landscape in central and northern Idaho.
Kgdh	Cretaceous granitic rocks of the hornblene-biotite suite; granite, granodiorite and megacrystic granodiorite. Potassium (K) rich. Age about 80 to 90 Ma.
Kog	Cretaceous orthogneiss, and foliated granodiorite and granite (includes mylonitic plutonic rocks in western Idaho suture zone); deformed early phases of the Idaho batholith.
Ꞓs	Cambrian sedimentary rocks.
Yag	Mesoproterozoic augen gneiss and porphyritic granite; near Shoup on the Main Salmon River age is 1370 Ma.
Ymiu	Upper Missoula Group. Includes Swauger Quartzite, Lawson Creek Formation in Lemhi Range, and Striped Peak and Libby formations In northern Idaho.
Ymil	Lower Missoula Group. Includes Gunsight Formation in Lemhi Range and upper Wallace Formation (equivalent to Snowslip and Shepard formations) in northern Idaho.
Yc	Piegan Group or Middle Belt carbonate, Apple Creek Formation [includes lower and middle Wallace Formation in northern Idaho and Apple Creek Formation and argillaceous quartzite (including rocks at Cobalt) near Salmon].
Yra	Ravalli Group, sandstone (quartzite) and siltite, includes Big Creek Formation and lower part of Lemhi Group in Lemhi Range and Salmon River Mountains, and Burke, Revett and St. Regis formations in northern Idaho.
Yp	Prichard Formation (Lower Belt), dark fine-grained siltstone and sandstone, calcareous intervals in Boehl's Butte area.
YXm	High-grade metamorphic rocks (schist, gneiss, quartzite, calc-silicate rocks); includes Elk City metamorphic sequence and related rocks, Syringa metamorphic sequence, and Priest River metamorphic complex.

Miocene and Younger Faults in Idaho

Compiled by
Roy M. Breckenridge, Reed S. Lewis,
Guy W. Adema, and Daniel W. Weisz

2003

Digital Cartography by
Loudon R. Stanford and Jane S. Freed

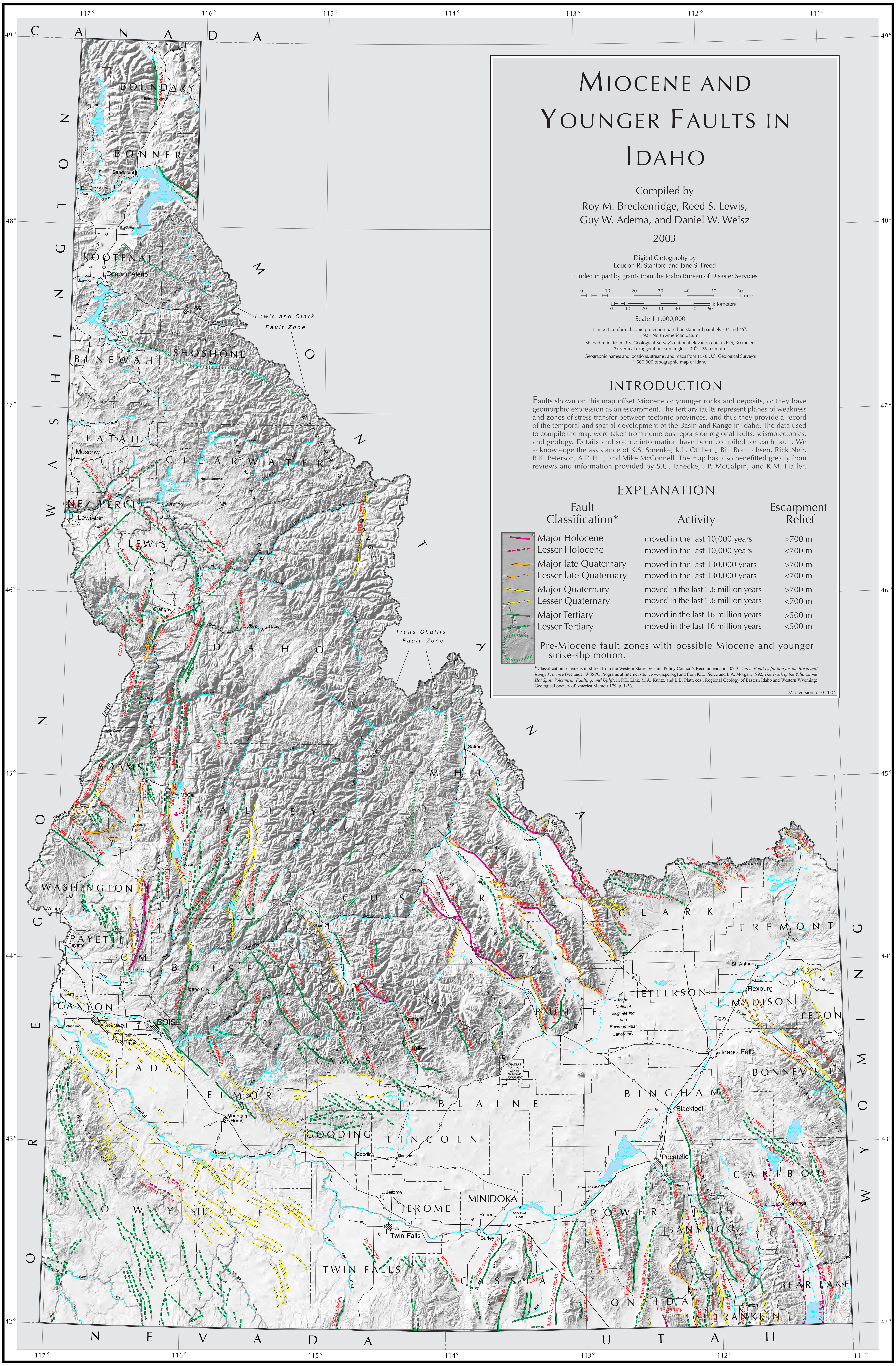
Funded in part by grants from the Idaho Bureau of Disaster Services

Scale 1:1,000,000

Lambert conformal conic projection based on standard parallels 33° and 45°, 1927 North American datum.

Shaded relief from U.S. Geological Survey's national elevation data (NED), 30 meter; 2x vertical exaggeration; sun angle of 30°; NW azimuth.

Geographic names and locations, streams, and roads from 1976 U.S. Geological Survey's 1:500,000 topographic map of Idaho.



INTRODUCTION

Faults shown on this map offset Miocene or younger rocks and deposits, or they have geomorphic expression as an escarpment. The Tertiary faults represent planes of weakness and zones of stress transfer between tectonic provinces, and thus they provide a record of the temporal and spatial development of the Basin and Range in Idaho. The data used to compile the map were taken from numerous reports on regional faults, seismotectonics, and geology. Details and source information have been compiled for each fault. We acknowledge the assistance of K.S. Sprenke, K.L. Othberg, Bill Bonnichsen, Rick Neir, B.K. Peterson, A.P. Hilt, and Mike McConnell. The map has also benefitted greatly from reviews and information provided by S.U. Janecke, J.P. McCalpin, and K.M. Haller.

EXPLANATION

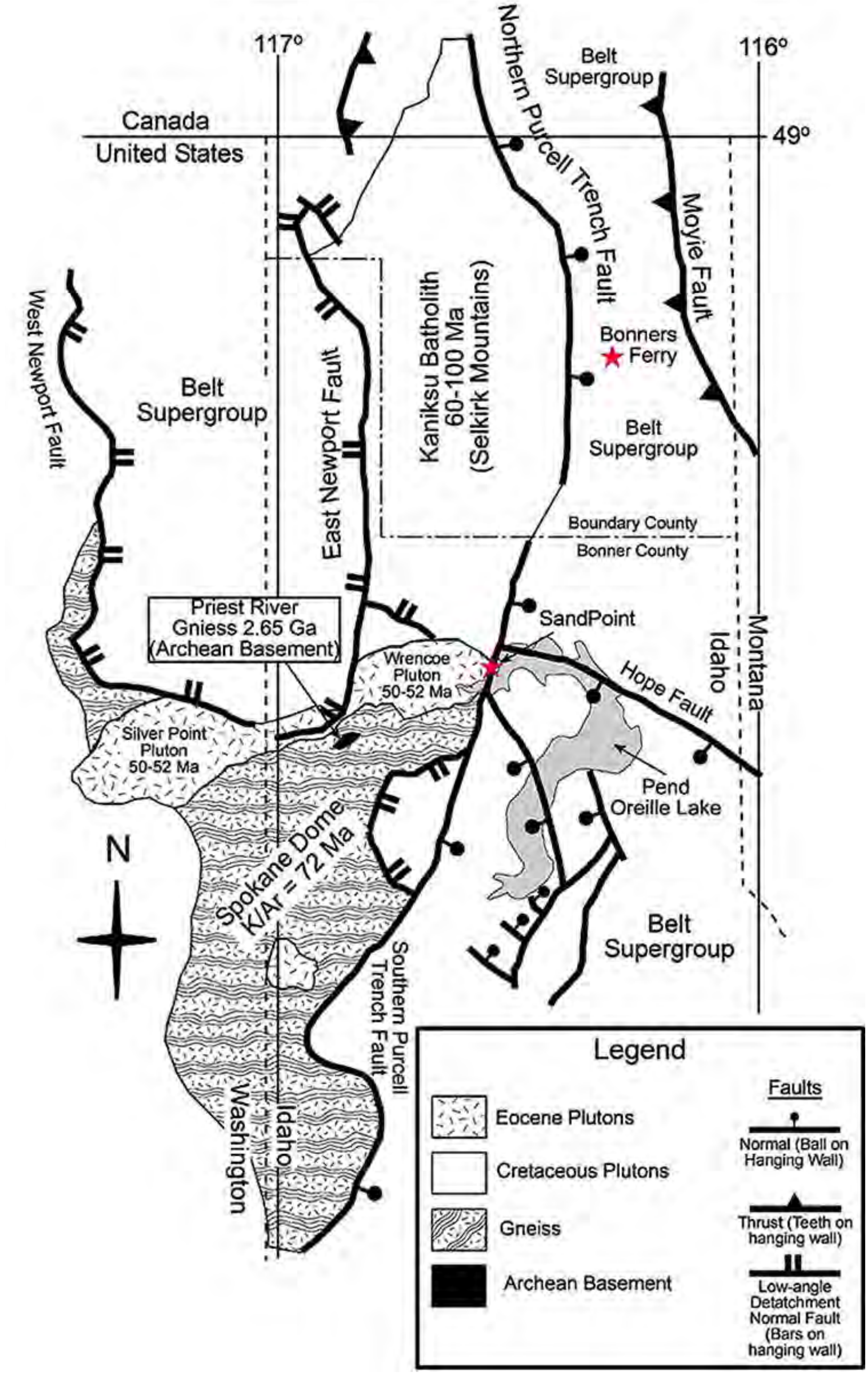
Fault Classification*	Activity	Escarpment Relief
Major Holocene	moved in the last 10,000 years	>700 m
Lesser Holocene	moved in the last 10,000 years	<700 m
Major late Quaternary	moved in the last 130,000 years	>700 m
Lesser late Quaternary	moved in the last 130,000 years	<700 m
Major Quaternary	moved in the last 1.6 million years	>700 m
Lesser Quaternary	moved in the last 1.6 million years	<700 m
Major Tertiary	moved in the last 16 million years	>500 m
Lesser Tertiary	moved in the last 16 million years	<500 m

Pre-Miocene fault zones with possible Miocene and younger strike-slip motion.

*Classification scheme is modified from the Western States Seismic Policy Council's Recommendation 02-3, *Active Fault Definition for the Basin and Range Province* (see under WSSPC Programs at Internet site www.wsspc.org) and from K.L. Pierce and L.A. Morgan, 1992, *The Track of the Yellowstone Hot Spot: Volcanism, Faulting, and Uplift*, in P.K. Link, M.A, Kuntz, and L.B. Platt, eds., Regional Geology of Eastern Idaho and Western Wyoming: Geological Society of America Memoir 179, p. 1-53.

Map Version 5-10-2004

Published and sold by the Idaho Geological Survey
University of Idaho, Moscow, Idaho 83844-3014


117°
116°
49°
Canada
United States
Belt Supergroup
Northern Purcell Trench Fault
Moyie Fault
Kaniksu Batholith
60-100 Ma
(Selkirk Mountains)
Bonners Ferry
West Newport Fault
East Newport Fault
Boundary County
Bonner County
Priest River
Gniess 2.65 Ga
(Archean Basement)
SandPoint
Wrencoe Pluton
50-52 Ma
Silver Point Pluton
50-52 Ma
Hope Fault
Idaho
Montana
Pend Oreille Lake
Spokane Dome
K/Ar = 72 Ma
N
Southern Purcell Trench Fault
Washington
Legend
Faults
Eocene Plutons
Cretaceous Plutons
Gneiss
Archean Basement
Normal (Ball on Hanging Wall)
Thrust (Teeth on hanging wall)
Low-angle Detatchment Normal Fault (Bars on hanging wall)

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Appendix 5-B

Endangered Species and Critical Habitat Map

THIS PAGE WAS INTENTIONALLY LEFT BLANK

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Idaho Fish And Wildlife Office
1387 South Vinnell Way, Suite 368
Boise, ID 83709-1657
Phone: (208) 378-5243 Fax: (208) 378-5262

In Reply Refer To: June 10, 2020
Consultation Code: 01EIFW00-2020-SLI-1118
Event Code: 01EIFW00-2020-E-02539
Project Name: Bayview Water & Sewer District Drinking Water Improvements

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (https://ww.fws.gov/migratorybirds/pdf/management/eagleconservtionplanguidance.pdf). Additionally, wind energy projects should follow the wind energy guidelines (https://www.fws.gov/ecologica-servces/energy-develpment/wind/html) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: https://www.fws.ov/bidsbird-enthusiasts/threats-to-birds/collisions/communication-towers.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Idaho Fish And Wildlife Office
1387 South Vinnell Way, Suite 368
Boise, ID 83709-1657
(208) 378-5243

Project Summary

Consultation Code: 01EIFW00-2020-SLI-1118

Event Code: 01EIFW00-2020-E-02539

Project Name: Bayview Water & Sewer District Drinking Water Improvements

Project Type: WATER SUPPLY / DELIVERY

Project Description: Rehabilitation of water tank, upgrade SCDA system, Upgrades to two wells, general improvements and upgrades to existing lines, and new transmission line.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/47.9786052871342N116.56514751905388W

Counties: Bonner, ID | Kootenai, ID

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
North American Wolverine *Gulo gulo luscus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5123	Proposed Threatened

Fishes

NAME	STATUS
Bull Trout *Salvelinus confluentus* Population: U.S.A., conterminous, lower 48 states There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8212	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Cassin's Finch *Carpodacus cassinii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15

NAME	BREEDING SEASON
Rufous Hummingbird *selasphorus rufus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds Apr 15 to Jul 15

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ( )

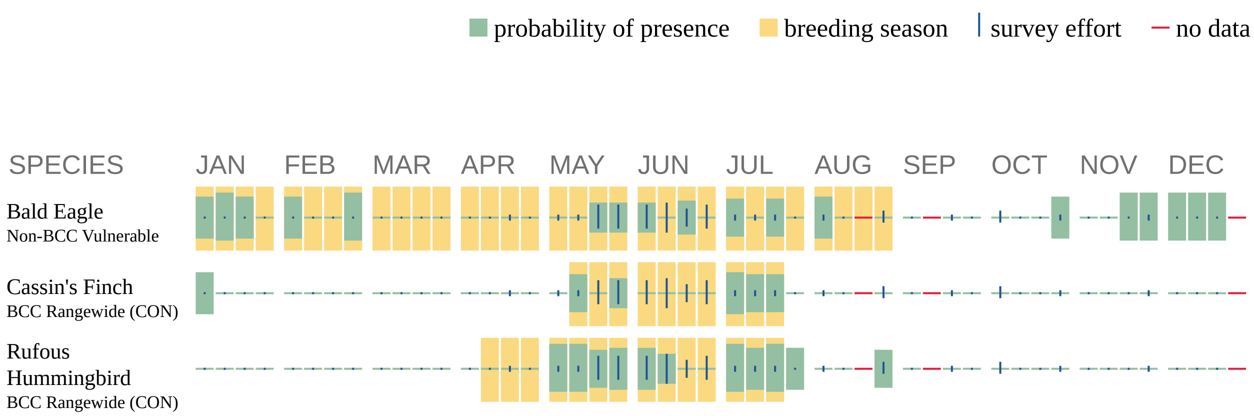
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ( )

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding

in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In

contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1C

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1C

FRESHWATER POND

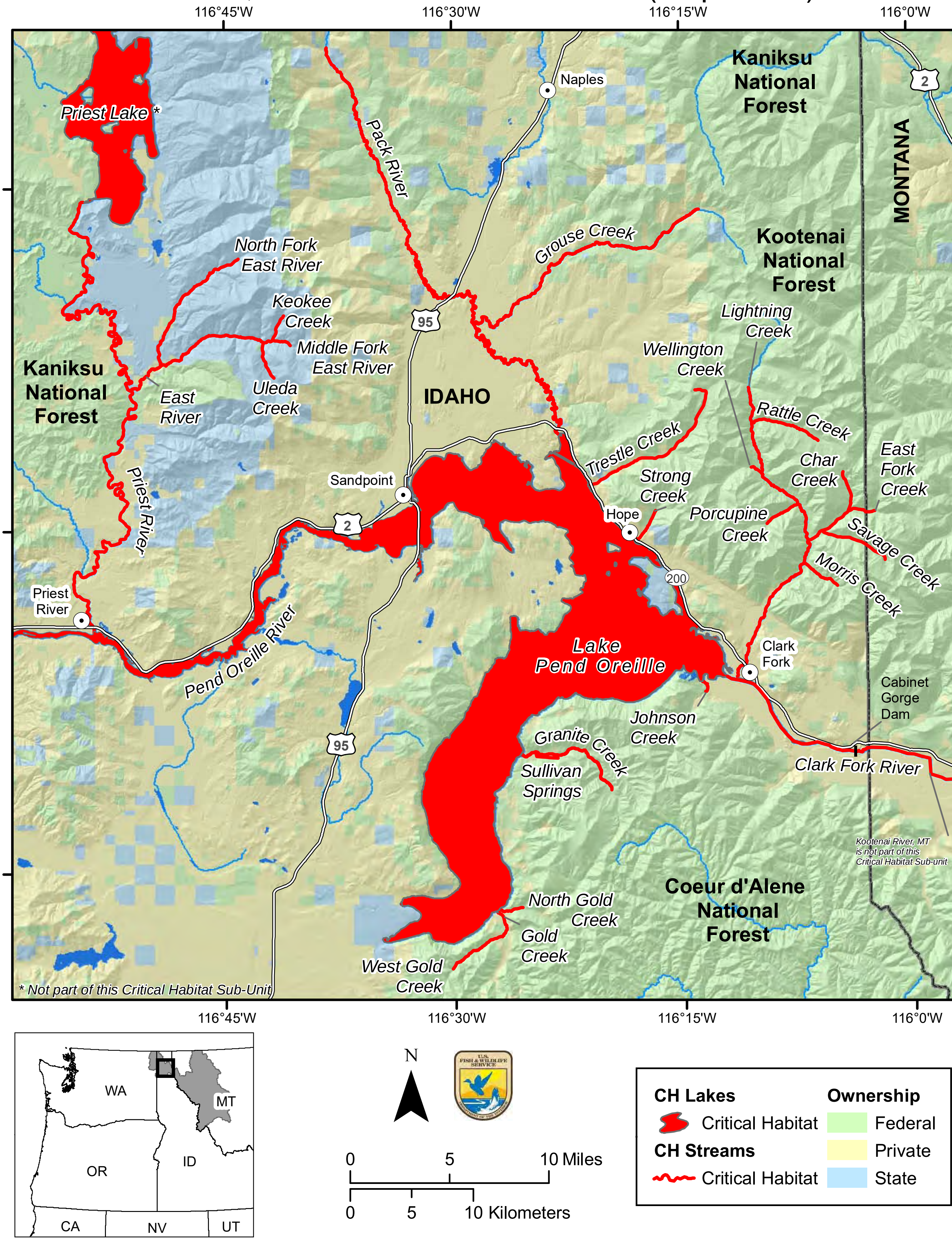
- PUBHh

RIVERINE

- R4SBA
- R5UBH

Critical Habitat for Bull Trout *(Salvelinus confluentus)*

Unit: 31, Sub-unit Lake Pend Oreille (Map 1 of 3)



Appendix 5-C

National Register of Historic Places in Idaho

THIS PAGE WAS INTENTIONALLY LEFT BLANK

The National Register of Historic Places in Idaho

Last Updated
4/27/2018

Idaho State Historical Society

Mission statement

To educate through the identification, preservation, and interpretation of Idaho’s cultural heritage.

Vision statement of purpose

The Idaho State Historical Society (ISHS) acts on behalf of the citizens of the state to facilitate and assure the protection of Idaho's cultural heritage. The ISHS maintains access to documents, artifacts, and sites that can be used by the public for their benefit and appreciation. The ISHS identifies, documents, collects, conserves, interprets, and maintains historic and prehistoric resources. Access to these resources is provided through public outreach, publications, technical assistance, exhibits, and the encouragement of local, state and regional efforts to preserve history. The ISHS undertakes and promotes these activities through its goals and policies in accordance with the powers and duties assigned to it.

◆ ◆ ◆

The Idaho State Historic Preservation Office (SHPO) was established under the auspices of the National Historic Preservation Act of 1966. A division of the Idaho State Historical Society, the SHPO is the lead historic preservation agency in Idaho and undertakes identification, evaluation, recognition, and protection of Idaho's historic resources.

◆ ◆ ◆

This booklet was originally complied by Belinda Davis and Ann Swanson in 1997.
This iteration marks the 20th anniversary of its creation.

Introduction

The purpose of this booklet is to define briefly the National Register of Historic Places program and to provide a guide to Idaho properties listed in the National Register of Historic Places (NRHP). It is hoped this publication will stimulate the user's curiosity to seek more information about these and other important sites in Idaho's history. More detailed information regarding each property can be obtained by contacting the Idaho State Historical Society, State Historic Preservation Office (SHPO).

The information in this booklet is complete as of April 27, 2018. For more information about upcoming listings, please visit our website www.history.idaho.gov/national-register-historic-places, or call (208) 488-7474.

Remember, most of the properties listed are privately owned and are not open to the public. Please respect the occupant's right to privacy when viewing historic properties.

The National Register of Historic Places

The National Register of Historic Places is the official list of the Nation's cultural resources deemed worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic resources. The National Register is maintained by the National Park Service under the Secretary of the Interior. In Idaho, it is administered by the SHPO.

Properties listed in the National Register include districts (Chinese Sites in the Warren Mining District), sites (Pierre's Hole 1832 Battle Area Site), buildings (Josiah Scott House), structures (Diversion Dam and Deer Flat Embank- ments), and objects (Treaty Rock) that are significant in American history, architecture, archaeology, engineering, and culture. These resources contribute to an understanding of the historical and cultural foundation of the nation.

Listing in the National Register has the following results which assist in preserving historic properties:

- Recognition that a property is of significance to the nation, the state, or the community.
- Consideration in the planning for federal or federally assisted projects.
- Eligibility for federal tax benefits.
- Consideration in the decision to issue a surface coal mining permit.
- Qualification for federal assistance for historic preservation, when funds are available.

Listing in the National Register does not restrict the rights of private property owners to alter, manage, or dispose of property.

"In every community, every county, there are certain buildings, certain neighbor-hoods, open spaces, which traditionally have had special meaning for local residents and which proclaim to all comers the unique character and heritage of that particular place."

—from Mavis Bryant, *Zoning for Community Preservation*

How to use this booklet

This booklet is organized alphabetically, first by county, then by city or town in or near where the property is located, and finally by property name. Listed below the property name is the street address or other locational information followed by the date of listing in the National Register. In the case of districts, boundary descriptions are provided. Properties located within districts are not listed individually. Due to their sensitive nature, specific locations of archaeological sites are omitted and appear as 'address restricted'. The National Register Information System (NRIS) reference number is listed next, followed by its National Register listing criteria. In many cases, a property is included as part of a larger group nomination of related significant properties. These property listings are followed by the name of the corresponding multiple property submission. Before the term *Multiple Property Submission* (MPS) was introduced in 1984, such listings were known as *Thematic Resources* (TR), or *Multiple Resource Areas* (MRA).

"...the historical and cultural foundations of the Nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people;"

—The National Historic Preservation Act as amended

Multiple Property Listings

- Agricultural Properties of Latah County, Idaho MPS
- American Falls, Idaho, Relocated Townsite MPS
- Boise Public Schools TR
- Buhl Dairy Barns TR
- Challis MRA
- Chinese Sites in the Warren Mining District MPS
- County Courthouses in Idaho MPS
- Drive-In Theaters in Idaho MPS
- Early Churches of Emmett TR
- Elk City Wagon Road MPS
- Historic Rural Properties of Ada County, Idaho MPS
- Idaho Falls Downtown MRA
- Kootenai County Rural Schools TR
- Lava Rock Structures in South Central Idaho TR
- Long Valley Finnish Structures TR
- Metal Truss Highway Bridges of Idaho MPS
- Motion Picture Theater Buildings in Idaho MPS
- New Sweden and Riverview Farmsteads and Institutional Buildings MPS
- North Idaho 1910 Fire Sites TR
- Paris MRA
- Pegram Truss Railroad Bridges of Idaho MPS
- Potlatch MRA
- Public School Buildings in Idaho MPS
- The Grange in Idaho MPS
- Tourtellotte and Hummel Architecture TR
- US Post Offices in Idaho 1900-1941 MPS

NPNHP—Nez Perce National Historical Park

- Camas Meadows Camp and Battle Sites [Clark County]
- Pierce Courthouse [Clearwater County]
- Lolo Trail [Clearwater County]
- Weippe Prairie [Clearwater County]
- White Bird Battlefield [Idaho County]
- St. Joseph's Mission [Lewis County]
- Lenore Site [Nez Perce County]
- Hasotino [Nez Perce County]

National Historic Landmarks (NHL)

National Historic Landmark properties have significance at the national level and are designated as such by the Secretary of the Interior. In Idaho, there are ten National Historic Landmarks.

- U.S. Assay Office [Ada County]
- Fort Hall [Bannock County]
- Experimental Breeder Reactor No. 1 [Butte County]
- City of Rocks [Cassia County]
- Camas Meadows Camp and Battle Sites [Clark County]
- Lolo Trail [Clearwater County]
- Weippe Prairie [Clearwater County]
- Bear River Battleground [Franklin County]
- Cataldo Mission [Kootenai County]
- Lemhi Pass [Lemhi County]

National Register criteria

Properties nominated to the Register are generally 50 years old or older and are significant in relation to one or more of the following criteria. Criteria is defined as the quality of significance in American history, architecture, archaeology, engineering, and culture present in properties that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A) That are associated with events that have made a significant contribution to the broad patterns of our history; or
B) That are associated with the lives of persons significant in our past; or
C) That embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D) That have yielded, or may be likely to yield, information important in prehistory or history.

Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

a) A religious property deriving primary significance from architecture or artistic distinction or historic importance; or
b) A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
c) A birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his or her productive life; or
d) A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or

"A knowledge of our heritage provides continuity and context for communities and orients them in their decision making."

—From Kathleen A. Hunter, *Past Meets Future*

e) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
f) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance; or
g) A property achieving significance within the past 50 years if it is of exceptional importance.

Historic integrity

Historic integrity is the authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's period of significance.

Historic integrity is the composite of seven qualities: location, design, setting, materials, workmanship, feeling, association.

Historic integrity enables a property to illustrate significant aspects of its past. For this reason, it is an important qualification for National Register listing. A property not only must retain its historic appearance but also must possess its physical materials, design features, and aspects of construction dating from the period when it attained significance. The integrity of archaeological resources is generally based on the degree to which remaining evidence can provide important information. All seven qualities do not need to be present for eligibility as long as the overall sense of past time and place is evident.

"These special places reveal every aspect of our country's origins and development - our land, houses, workplaces, parks, roadways, waterways, places of worship, and objects of art."

—from *A Heritage So Rich*

The National Register nomination process

The SHPO administers the National Register of Historic Places program in Idaho and processes nominations to the National Register of Historic Places. Properties nominated to the Register are reviewed by the Idaho Historic Sites Review Board which meets periodically throughout the year. The Review Board is a volunteer group of Idaho residents who have demonstrated a competence, interest, or knowledge in historic preservation. Their recommendations are reviewed by the SHPO. Finally, nominations are forwarded to the Keeper of the Register (National Park Service) for official listing.

Anyone may prepare a nomination for listing a property in the Register. Generally, nominations are prepared by private property owners, other interested individuals, local organizations or governments, and state or federal agencies at all levels. Instructions for completing a nomination are available from the SHPO.

ADA COUNTY

BOISE

Abbs, Walter, House
915 W. Fort St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000175 (C)

Ada (Egyptian) Theater
700 Main St., Boise
11/21/1974
74000724 (C)

Ada Odd Fellows Temple
109-115 ½ N. 9th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000176 (C)

Alexander, Moses, House
304 W. State St, Boise
8/7/1972
72000431 (B, C)

Alexanders
826 Main St., Boise
11/20/1978
78001029 (A)

Allsup, Marion, House
1601 N. 10th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000178 (C)

Anduiza Hotel
619 Grove St., Boise
2/25/2003
03000064 (A, C)

Artesian Water Co. Pumphouse and Wells
Vic of Old Penitentiary Rd., Boise
7/26/1979
79000763 (A)

Assay Office
210 Main St., Boise
10/15/1966
National Historic Landmark
66000305 (A, C)

Barber Dam and Lumber Mill
S of Hwy 21, 5 mi. E of Boise on N bank of Boise River, Boise vicinity
11/21/1978
78001037 (A, D)

Beck, Albert, House
1101 W. Fort St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000179 (C)

Boise Capitol Area District
Roughly bounded by N. 6th and Bannock, N. 8th, State, 5th and Jefferson Sts., Boise
5/12/1976
76000663 (A, C)

Boise City National Bank
N. 8th and Idaho Sts., Boise
11/28/1978
78001030 (C)

Boise High School Campus
Washington St. between N. 9th and N. 11th Sts., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000180 (C)

Boise Historic District
N. 5th and N. 6th Sts., both sides of Idaho and Main Sts., Boise
11/9/1977
77000448 (A, C)

Boise Junior College Administration Building
Boise State University campus, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000181 (A, C)

Boise Junior High School (North)
1105 N. 13th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000186 (C)

Boulevard Mo-tel
1121 S. Capitol Blvd., Boise
1/7/1998
97001609 (A, C)

Bown, Joseph, House
2020 E. Victory Rd., Boise vicinity
6/18/1974
79000768 (A, C)

Brunzell House
916 W. Franklin St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000182 (C)

Bryant, H. H., Garage
11th and Front NE, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000184 (C)

Burnett, H. C., House
124 W. Bannock St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000183 (C)

Capitol Boulevard Memorial Bridge
Capitol Blvd over the Boise River, Boise
11/5/1990
90001717 (A, C)

Carnegie Public Library
815 W. Washington St., Boise
11/21/1974
74000725 (C)

Cavanah, C. C., House
107 E. Idaho St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000185 (C)

Chinese Odd Fellows Building
610 Front St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000187 (C)

Chitwood, Joseph, House
1321 S. Denver Ave., Boise
8/23/2006
06000709 (A)

Christ Chapel
Broadway Ave. and Campus Dr., Boise
7/17/1974
74000726 (A, B, C)

Christian Church
615 N. 9th St., Boise
2/17/1978
78001031 (C)

Coffin, Henry, House
1403 W. Franklin St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000188 (C)

Cole School and Gymnasium
7145 Fairview Ave., Boise
11/8/1982
Boise Public Schools TR
82000189 (A, C)

Collister School
4426 Catalpa Dr., Boise
11/8/1982
Boise Public Schools TR
82000190 (A, C)

Congregation Beth Israel Synagogue
1102 W. State St., Boise
11/3/1972
72000432 (A, C)

Daly, John, House
1015 W. Hays St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000191 (C)

Davies, Dr. James, House
1107 W. Washington St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000192 (C)

Davis, R. K., House
1016 W. Franklin St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000193 (C)

Diversion Dam and Deer Flat Embankments
SE of Boise across Boise River (dam), Boise vicinity
3/15/1976
76000666 (A, C)

Dry Creek Rockshelter
Address Restricted, Boise vicinity
11/22/1991
91001719 (D)

Dunbar, William, House
1500 W. Hays St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000195 (C)

Dunton, Minnie Priest, House
906 W. Hays St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000194 (C)

Echevarria, Pedro, House
5605 W. State St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000196 (C)

Eichelberger Apartments (Flats)
612-624 N. 9th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000197 (C)

Elks Temple
350 N. 9th St./310 Jefferson St., Boise
2/17/1978
78001032 (C)

Fleharty, Alva, House
907 W. Hays St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000198 (C)

Fort Boise (U.S. Army)
500 W. Fort St., Boise
11/9/1972
72000433 (A, C)

Fort Street Historic District
Roughly bounded by Fort, State, N. 6th, and N. 16th Sts., Boise
11/12/1982
82000199 (C)

Franklin Elementary School
5007 Franklin Rd., Boise
11/8/1982
Boise Public Schools TR
82000200 (A, C)

Friedline Apartments
1312-1326 ½ W. State St., Boise
10/29/1982
82000201 (C)

Fritchman, H. K., House
1207 W. Hays St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000202 (C)

Funsten, Bishop, House
2420 Old Penitentiary Rd., Boise
1/3/1983
Tourtellotte and Hummel Architecture TR
83000256 (C)

Gakey, J. H., House
1402 W. Franklin St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000203 (C)

GAR Hall
714 W. State St., Boise
1/21/1974
74000727 (A, C)

Garfield School
1914 S. Broadway Ave., Boise
11/8/1982
Boise Public Schools TR
82000204 (A, C)

Goreczky, Anton, House
1601 N. 7th St., Boise
3/20/1986
86000438 (C)

Green, John, Mausoleum
Morris Hill Cemetery at Latah and Emerald, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000205 (C)

Guernsey Dairy Milk Depot
2419 W. State St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000206 (C)

Haines, John, House
919 W. Hays St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000207 (C)

Harrison Boulevard Historic District
An irregular pattern along Harrison Blvd., Boise
2/29/1980
80001286 (A, C)

Hays, Samuel, House
612 W. Franklin St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000208 (C)

Hopffgarten House
1115 W. Boise Ave, Boise
8/30/1979
79000764 (B, C)

Hottes, Fred, House
509 W. Hays St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000209 (C)

Hyde Park Historic District
Both sides of N. 13th St. between Alturas and Brumback Sts., Boise, Boise
10/29/1982
82000211 (C)

Idaho Building
Bannock and N. 8th Sts., Boise
12/8/1978
78001033 (C)

Idaho National Guard Armory
801 Reserve St., Boise
2/26/1999
Tourtellotte and Hummel Architecture TR
99000253 (A, C)

Idaho State Forester's Building
801 S. Capital Blvd., Boise
1/16/1997
96001591 (C)

Idanha Hotel
928 Main St., Boise
7/9/1974
74000728 (C)

Immanuel Evangelical Lutheran Church
707 W. Fort St., Boise
6/17/1976
76000664 (C)

Immanuel Methodist Episcopal Church
1406 Eastman St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000212 (C)

Jacobs, Cyrus, House
607 Grove St., Boise
11/27/1972
72000434 (B, C)

Jefferson, W. E., House
1117 N. 8th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000214 (C)

Johnson, J. M., House
1002 W. Franklin St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000215 (C)

Jones, T. J., Apartments
917-923 W. Fort St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000216 (C)

Kieldson Double House
413-15 Jefferson, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000217 (C)

Kinney, Joseph, Mausoleum
Morris Hill Cemetery at Latah and Emerald, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000218 (C)

Logan, Mayor Thomas E., House
602 N. Julia Davis Dr., Boise
9/22/1971
71000289 (B)

Longfellow School
1511 N. 9th St., Boise
11/8/1982
Boise Public Schools TR
82000219 (A, C)

Lowell School
1507 N. 28th St., Boise
11/8/1982
Boise Public Schools TR
82000220 (A, C)

Lower Main Street Commercial Historic District
Main St. between N. 10th and N. 12th Sts., Boise
11/28/1980
80001290 (A, C)

MacMillan Chapel
Cloverdale and MacMalillan Rds, Boise vicinity
9/7/1984
84000989 (A, C)

Marks, M. J., House
1001 W. Hays St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000221 (C)

McCarthy, Judge Charles P., House
1415 W. Fort St., Boise
8/30/1979
79000765 (C)

McElroy, H. E., House
924 W. Fort St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000222 (C)

Mickle, Willis, House
1415 N. 8th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000224 (C)

Mitchell Hotel
223-237 S 10th, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000225 (C)

Moore-Cunningham House
1109 Warm Springs Ave., Boise
4/29/1977
77000449 (A, B, C)

Morris Hill Cemetery Mausoleum
Morris Hill Cemetery at Latah and Emerald, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000226 (C)

Murphy, Daniel F., House
1608 N. 9th St., Boise
5/17/1982
82002504 (B, C)

Neal, Scott, House
215 E. Jefferson, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000228 (C)

Neitzel, H. R., House
705 N. 9th St, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000229 (C)

Ninth Street Bridge
E of new 9th St. bridge, over Boise River, Boise
9/14/2001
Metal Truss Highway Bridges of Idaho MPS
01000980 (C)

Nixon, Axel, House
815-815 ½ W. Hays St, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000230 (C)

O'Farrell, John A., Cabin
N side of W. Fort St. between N. 4th and N. 5th sts., Boise
12/3/1999
99001415 (A)

O'Farrell, John A., House
420 W. Franklin St., Boise
9/4/1979
79000766 (C)

Old Idaho State Penitentiary
2200 Warm Springs Ave, Boise
7/17/1974
74000729 (A, C)

Oregon Trail
approx. 8 mi. SE of Boise; and at E. Amity Rd., Boise vicinity
10/18/1972
72000435 (A)

Parker, John, House
713 W. Fanklin St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000231 (C)

Paynton, Charles, House
1213 N. 8th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000232 (C)

Pierce Park School
5015 Pierce Park Ln., Boise
11/8/1982
Boise Public Schools TR
82000233 (A, C)

Reclamation Service Boise Project Office
214 Broadway Ave., Boise
8/12/2010
10000546 (A, C)

Regan, John, American Legion Hall
401 W. Idaho, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000234 (C)

Reiger, Fred, Houses
214-218 E. Jefferson, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000235 (C)

Roosevelt School
908 E. Jefferson, Boise
11/8/1982
Boise Public Schools TR
82000236 (A, C)

Rosedale Odd Fellows Temple
1755 Broadway, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000237 (C)

Rossi, Mrs. A. F., House
1711 Boise Ave, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000238 (C)

Schick/Ostolasa Farmstead
5213 Dry Creek Rd., Boise
8/23/2006
06000710 (A)

Schmelzel, H. A., House
615 W. Hays St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000239 (C)

Schreiber, Adolph, House
710 N. 6th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000240 (C)

Sensenig, Emerson and Lucretia, House
1519 Jefferson St., Boise
1/16/1997
96001590 (A, C)

Sidenfaden, William, House
904-906 W. Franklin St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000241 (C)

Simpson, W. A., House
1004 N. 10th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000242 (C)

Smith, Nathan, Farmhouse
2315 Broadway Ave., Boise
1/3/1983
Tourtellotte and Hummel Architecture TR
83000258 (C)

South Boise Fire Station
1011 Williams St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000243 (C)

South Eighth Street Historic District
Roughly bounded by 8th, 9th, Miller, and Broad Sts., Boise
12/12/1977
77000450 (A, C)

Spaulding, Almon W. and Dr. Mary E., Ranch
3805 N. Cole Rd., Boise
11/25/1994
94001363 (A)

St. Alphonsus' Hospital Nurses' Home and Heating Pland/Laundry
N. 4th St. between Washington and State Sts., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000244 (C)

St. John's Cathedral
807 N. 8th St., Boise
5/24/1978
Tourtellotte and Hummel Architecture TR
78001035 (C)

St. John's Cathedral Block
8th and Hays Sts., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000245 (A, C)

St. Mary's Catholic Church
State and 26th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000246 (C)

St. Paul Missionary Baptist Church
124 Broadway Ave, Boise
10/29/1982
82000247 (C)

State Street Historic District
Jefferson, 2nd and 3rd Sts., Boise
12/15/1978
78001036 (B, C)

Stephan, Louis. House
1709 N. 18th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000248 (C)

Tourtellotte, John, Building
210-222 N. 10th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000249 (C)

Tuttle, Bishop Daniel S., House
512 N. 8th St., Boise
12/4/1980
80001291 (C)

Union Block and Montandon Building
8th and Idaho Sts., Boise
3/7/1979
79000767 (C)

Union Pacific Mainline Depot
1701 Eastover Terrace, Boise
8/7/1974
74000730 (A, C)

Ustick School
2971 Mumbarto Ave., Boise
10/29/1982
82000250 (A, C)

Wallace, J. N., House
707 N. 12th St./1202 W. Franklin St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000251 (C)

Warm Springs Avenue Historic District
Warm Springs Ave., Boise
9/22/1980
80001287 (C)

Waymire, C.H. Building
1521 N. 13th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000252 (C)

Welch, Edward, House
1321 E. Jefferson, Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000253 (C)

Wellman Apartments
500 W. Franklin St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000254 (C)

West Warm Springs Historic District
Warm Springs Ave., Main, 1st, 2nd, and Idaho Sts., Boise
12/12/1977
77000451 (C)

Whitehead, William, House
3921 W. Catalpa Drive, Boise
4/19/2016
Tourtellotte and Hummel Architecture TR
16000176 (C)

Whitney School
1609 S. Owyhee, Boise
11/8/1982
Boise Public Schools TR
82000255 (A, C)

Wolters Double Houses
718-722 N. 8th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000256 (C)

Zurcher, Oscar, Apartments
102 S. 17th St., Boise
11/17/1982
Tourtellotte and Hummel Architecture TR
82000257 (C)

EAGLE

Aiken's Hotel
99 E. State St., Eagle
10/29/1982
82000177 (A, C)

Bushnell-Fisher House
349 W. State St., Eagle
11/2/2011
11000777 (A)

Eagle Adventist School
Ballantyne Road, Eagle vicinity
8/18/1980
80001288 (A)

Jackson, Orville and Floy, House
127 S. Eagle Rd., Eagle
11/17/1982
Tourtellotte and Hummel Architecture TR
82000213 (C)

Short, O. F., House
550 W. State St. (Hwy 44), Eagle vicinity
5/23/1980
80001289 (B, C)

Sonner-Osier Farmstead Historic District
4130 W. Beacon Light Rd., Eagle vicinity
6/5/2017
Historic Rural Properties of Ada County, Idaho MPS
100001021 (A)

Villeneuve, Charles and Martha, House
7575 W. Moon Valley Rd., Eagle
11/13/1990
90001731 (A, C)

GARDEN CITY

Pierce-Borah House
5933 N. Branstetter, Garden City vicinity
1/3/1983
Tourtellotte and Hummel Architecture TR
83000257 (C)

KUNA

Boise City-Silver City Road: Fick Property Segment
3232 W. Kuna-Mora Rd., Kuna vicinity
7/15/1999
99000852 (A)

Lilyquist-Christianson Building
459 W. 3rd, Kuna
4/1/1999
99000415 (A)

MERIDIAN

Bell, R. H. and Jessie, House
137 E. Pine, Meridian
2/1/2006
05001599 (C)

Hill, Clara, House
1123 E. 1st., Meridian
2/1/2006
05001600 (C)

Hunt, E. F., House
49 E State, Meridian
11/17/1982
Tourtellotte and Hummel Architecture TR
82000210 (C)

Meridian Exchange Bank
109 E 2nd St., Meridian
11/17/1982
Tourtellotte and Hummel Architecture TR
82000223 (A, C)

Mittleider Farmstead Historic District
575 Rumpel Ln., Meridian vicinity
3/20/2003
Historic Rural Properties of Ada County, Idaho MPS
03000122 (A, C)

Mountain States Telephone and Telegraph Company Building
815 N. Main St., Meridian
9/17/2008
08000905 (A)

Neal, Halbert and Grace, House
101 W. Pine St., Meridian
10/19/1982
82000227 (A, C)

Tolleth, Harry & Della, House
134 E. State, Meridian
12/20/1996
96001506 (A, C)

STAR

Star Camp
N. River Rd. and W. 3rd St., Star
4/27/2005
05000344 (A)

ADAMS COUNTY

COUNCIL

Adams County Courthouse
107 Michigan St., Council
9/22/1987
County Courthouses in Idaho MPS
87001599 (A, C)

Council Ranger Station
Hwy. 95 & Whiteley Ave., Council
11/19/1992
92000689 (A, C)

CUPRUM

Hells Canyon Archaeological District
Address Restricted, Cuprum vicinity
8/10/1984
84000984 (A, D)

Huntley, A. O., Barn
Approx. 2 mi. SW of Cuprum on W side of Indian Cr., Cuprum vicinity
11/14/1978
78001040 (C)

NEW MEADOWS

Heigho, Colonel E. M., Residence
Off SH 55 near New Meadows, New Meadows
5/22/1978
78001041 (B, C)

Meadows Schoolhouse
ID-55 and Truesdale St., New Meadows
10/30/1979
79000769 (C)

Pacific and Idaho Northern Railroad Depot
Commercial Ave. between Katherine St. and SH 55, New Meadows
4/19/1978
78001042 (A, C)

BANNOCK COUNTY

FORT HALL

Fort Hall
Fort Hall Indian Reservation, Fort Hall vicinity
10/15/1966
National Historic Landmark
66000306 (A, D)

LAVA HOT SPRINGS

L.D.S. Ward Building
187 S. 2nd Ave. W., Lava Hot Springs
12/9/1999
99001474 (C)

Lava High School Gymnasium
202 W. Fife St., Lava Hot Springs
7/9/1997
97000764 (A, C)

Riverside Inn
112 Portneuf Ave., Lava Hot Springs
8/29/1979
79000770 (A, C)

Whitestone Hotel
202 E. Main, Lava Hot Springs
4/7/1980
80001292 (C)

MCCAMMON

Harkness, H.O., Livery Stable
111 S. Railroad Ave., McCammon
2/1/1980
80001293 (A, C)

McCammon State Bank Bldg.
NW Corner Center and 3rd sts., McCammon
7/9/1979
79000771 (A, C)

POCATELLO

A.F.R. Building
501 N. Main, Pocatello
11/15/1990
90001737 (A, C)

Brady Memorial Chapel
Mountain View Cemetery, Pocatello
5/1/1979
79000772 (B, C)

Church of the Assumption
528 N. 5th Ave., Pocatello
5/1/1979
79000773 (A, C)

East Side Downtown Historic District
Roughly including the 200 and 300 blocks E. Center St., 100 block N. 2nd Ave. and 100 block S. 2nd Ave., Pocatello
11/25/1994
94001361 (A, C)

Hood, John, Residence
554 S. 7th Ave., Pocatello
12/14/1978
78001043 (B, C)

Hyde, William A. House
429 N. 7th, Pocatello
6/23/1983
83000259 (C)

Idaho State University Administration Building
919 S. 8th St., ISU Campus, Pocatello
9/23/1993
93000994 (C)

Idaho State University Neighborhood Historic District
Roughly bounded by 6th, 9th, Carter, and Center Sts.,, Pocatello
9/7/1984
84001008 (A, C)

Lincoln-Johnson Avenues Residential Historic District
Roughly bounded by W. Hayden St., the Portneuf River, W. Benton St., and the West Bench, Pocatello
3/15/2006
06000126 (A, C)

Old Town Residential Historic District
Roughly bounded by W. Benton St., S. Garfield St., W. Lewis St., and the Portneuf River, Pocatello
4/2/2008
08000249 (A, C)

Pocatello Carnegie Library
113 S. Garfield, Pocatello
7/2/1973
73000679 (C)

Pocatello Federal Building
150 S. Arthur St., Pocatello
10/5/1977
77000452 (C)

Pocatello Historic District
Roughly bounded by RR tracks, W. Fremont, W. Bonneville and Garfield Sts., Pocatello
6/3/1982
82002505 (A, C)

Pocatello Warehouse Historic District
Roughly bounded by S. 2nd Ave., E. Halliday, E. Sutter, and OSL RR tracks, Pocatello
9/3/1996
96000946 (A, C)

Pocatello Westside Residential Historic District
Roughly bounded by N. Arthur Ave., W. Fremont St., N. Grant Ave., and W. Young St., Pocatello
3/17/2003
03000102 (A, C)

Quinn Apartments
580 W. Clark St., Pocatello
1/11/1985
85000057 (A, C)

Rice-Packard House
454 N. Hayes Ave., Pocatello
9/12/1985
85002159 (C)

St. Joseph's Catholic Church
439 (455) N. Hayes, Pocatello
8/29/1978
78001044 (C)

Standrod House
648 N. Garfield Ave., Pocatello
1/18/1973
73000680 (B, C)

Sullivan-Kinney House
441 S. Garfield, Pocatello
11/9/1977
77000453 (C)

Trinity Episcopal Church
248 N. Arthur St., Pocatello
2/17/1978
78001045 (C)

Woolley Apartments
303 N. Hayes, Pocatello
10/31/1985
85003425 (C)

BEAR LAKE COUNTY

DINGLE

Ream, William and Nora, House
Dingle Rd. S of Ream Crockett Canal, Dingle vicinity
4/26/1991
91000460 (A, C)

FISH HAVEN

Scofield, Anna Nielsen, House
2788 US Hwy. 89, Fish Haven
4/1/1999
99000417 (C)

GEORGETOWN

Georgetown Relief Society Hall
161 3rd NW St., Georgetown
9/18/1998
98001171 (A)

MONTPELIER

Bagley, John A., House
155 N. 5th, Montpelier
1/20/1978
78001046 (B, C)

Montpelier Historic District
Washington Ave. and 6th St., Montpelier
11/16/1978
78001047 (C)

Montpelier Odd Fellows Hall
843 Washington St., Montpelier
4/15/1998
78001048 (C)

PARIS

Allred, Ezra, Bungalow
93 W. Center St., Paris
11/18/1982
Paris MRA
82000258 (C)

Allred, Ezra, Cottage
158 Main St., Paris
11/18/1982
Paris MRA
82000259 (C)

Ashley, Dr. George, House
40 W. 2nd North, Paris
11/18/1982
Paris MRA
82000261 (C)

Ashley, George, Sr., House
W. 2nd North, Paris
11/18/1982
Paris MRA
82000260 (C)

Athay, Sam, House
20 W 2nd N, Paris
11/18/1982
Paris MRA
82004939 (C)

Bear Lake County Courthouse
U.S. 89, Paris
10/7/1977
77000454 (C)

Bear Lake Markte
N. Main St., Paris
11/18/1982
Paris MRA
82000262 (A, C)

Bear Lake Stake Mormon Tabernacle
Main St., Paris
12/8/1972
72000436 (C)

Beck Barns and Automobile Storage
Center St., Paris
11/18/1982
Paris MRA
82000263 (C)

Bishop West Barn
W. 2nd St., Paris
11/18/1982
Paris MRA
82000264 (C)

Browning Block
Main and Center Sts., Paris
11/18/1982
Paris MRA
82000265 (A, C)

Budge Cottage
Center St., Paris
11/18/1982
Paris MRA
82000266 (C)

Budge, Alfred, House
N. 1st North, Paris
11/18/1982
Paris MRA
82000267 (A, C)

Budge, Julia, House
57 W. 1st North, Paris
11/18/1982
Paris MRA
82000268 (C)

Budge, Taft, Bungalow
86 Center St., Paris
11/18/1982
Paris MRA
82000260 (C)

Clayton, Russell, Bungalow
147 E. Center St., Paris
4/13/1983
Paris MRA
83000261 (C)

Cole House
SW of Paris, Paris vicinity
11/18/1982
Paris MRA
82000269 (C)

Collings, James, Jr., House
Approx. 1 mi. S of Paris on E side of US 89, Paris vicinity
11/18/1982
Paris MRA
82001888 (C)

Cook, Joseph, House
63 W. 2nd South, Paris
11/18/1982
Paris MRA
82000270 (C)

Davis, E.F., House
10 W. 2nd North, Paris
11/18/1982
Paris MRA
82000271 (C)

Grimmett, John Jr., House and Outbuildings
135 W. 2nd North, Paris
4/13/1983
Paris MRA
83000262 (A, C)

Grimmett, Orson, Bungalow
28 W. 2nd North, Paris
4/13/1983
Paris MRA
83000263 (C)

Grunder Cabin and Outbuildings
E 1st N, Paris
11/18/1982
Paris MRA
82000272 (C)

Hoffman Barn
N. 2nd East, Paris
11/18/1982
Paris MRA
82000273 (C)

Hoge, Walter, House
NW corner Center and N. 1st E., Paris
11/18/1982
Paris MRA
82000274 (C)

Hotel Paris
7 Main St., Paris
4/13/1983
Paris MRA
82000275 (C)

Hulme, Amos, Barn
N 1st E, Paris
11/18/1982
Paris MRA
82000276 (C)

Innes, Kate, House
100 E. 2nd South, Paris
4/13/1983
Paris MRA
83000264 (C)

Innes, Thomas, House
42 W 1st St., Paris
11/18/1982
Paris MRA
82000277 (C)

Jaussi Bungalow
170 E 2nd N, Paris
11/18/1982
Paris MRA
82000278 (C)

Keller House and Derrick
E 1st N, Paris
11/18/1982
Paris MRA
82001889 (C)

Kelsey, Robert, House
24 E. 2nd South, Paris
4/13/1983
Paris MRA
83000265 (C)

Latham House
152 S 1st E, Paris
4/13/1983
Paris MRA
83000266 (C)

Law, Oren, House and Outbuildings
592 Main St., Paris
11/18/1982
Paris MRA
82000281 (C)

LDS Seminary
Tabernacle Block, Paris
11/18/1982
Paris MRA
82000279 (A, C)

LDS Stake Office Building
S Main St., Paris
11/18/1982
Paris MRA
82000280 (A, C)

Lewis Barn
W 2nd N, Paris
11/18/1982
Paris MRA
82000282 (C)

Lewis Bungalow
W. 2nd North, Paris
4/13/1983
Paris MRA
83000267 (C)

Lewis, Fred, Cottage
W. 2nd North, Paris
4/13/1983
Paris MRA
83000268 (C)

Linvall, J.L., House and Outbuilding
E 2nd S, Paris
11/18/1982
Paris MRA
82000283 (C)

Linvall, Robb, House
Paris Canyon Rd., Paris
11/18/1982
Paris MRA
82000284 (C)

Low, Morris, Bungalow
48 W Center St., Paris
11/18/1982
Paris MRA
82000285 (C)

Nye, James, House
E. 1st South, Paris
4/13/1983
Paris MRA
83000269 (C)

Old LDS Tithing Office/Paris Post Building
Main St., Paris
11/18/1982
Paris MRA
82000286 (A, C)

Paris Cemetery
Off US 89, S of Paris, Paris
11/18/1982
Paris MRA
82000287 (A, C)

Paris Lumber Company Building
Main St, Paris
11/18/1982
Paris MRA
82000288 (A, C)

Paris Photo Studio
W Center St., Paris
11/18/1982
Paris MRA
82000289 (C)

Paris Public School
SE corner Main St. and E 1st N, Paris
11/18/1982
Paris MRA
82000290 (C)

Pendrey Drug Store Building
Main and Center Sts., Paris
11/18/1982
Paris MRA
82000291 (C)

Pendrey, Arthur, Cottage
193 Main St., Paris
11/18/1982
Paris MRA
82004938 (C)

Pendrey, Joe and Zina, Bungalow
N. Main St., Paris
4/13/1983
Paris MRA
83000270 (C)

Poulsen, Jim, House
146 E 1st N, Paris
11/18/1982
Paris MRA
82000292 (C)

Preston House
W. Center St., Paris
4/13/1983
Paris MRA
83000271 (C)

Price, Dan, House
NE corner W. 1st N. and N. 1st W., Paris
11/18/1982
Paris MRA
82000293 (C)

Price, Fred, Bungalow
N. 1st W., Paris
4/13/1983
Paris MRA
83000272 (C)

Price, Heber, Bungalow
60 W. 1st N., Paris
4/13/1983
Paris MRA
83000273 (C)

Price, Joe, House
W. 1st N. near Main St., Paris
11/18/1982
Paris MRA
82000294 (C)

Price, Robert, House
NW corner N. 1st W. and W. 1st N., Paris
11/18/1982
Paris MRA
82000295 (C)

Rich, Joseph, Barn
W. 2nd S., Paris
11/18/1982
Paris MRA
82004940 (C)

Rich, Landon, House and Barn
W. 1st S., Paris
11/18/1982
Paris MRA
82000297 (C)

Rich, William L., House
34 W 2nd S, Paris
11/18/1982
Paris MRA
82000298 (C)

Rich-Grandy Cabin
E 2nd S near Main St., Paris
11/18/1982
Paris MRA
82000296 (C)

Rogers, Franklin, Bungalow
55 E Center St., Paris
11/18/1982
Paris MRA
82000299 (C)

Rogers, Frederick, House
245 W 2nd N, Paris
11/18/1982
Paris MRA
82000300 (C)

Sheidigger, John, House and Outbuildings
E side US 89, 1 mi S of Paris, Paris vicinity
11/18/1982
Paris MRA
82000303 (C)

Shepherd Bungalow
55 W 1st N, Paris
4/13/1983
Paris MRA
83000274 (C)

Shepherd Hardware
Main St., Paris
11/18/1982
Paris MRA
82000304 (C)

Shepherd, Earl, Bungalow
104 Center St., Paris
11/18/1982
Paris MRA
82000301 (C)

Shepherd, J. R., House
58 W Center, Paris
11/18/1982
Paris MRA
82000305 (C)

Shepherd, Les and Hazel, Bungalow
185 Main St., Paris
11/18/1982
Paris MRA
82000306 (C)

Shepherd, Ted, Cottage
N 1st West, Paris
11/18/1982
Paris MRA
82000302 (C)

Sleight, Thomas, Cabin
Main St., Paris
11/18/1982
Paris MRA
82000307 (C)

Smedley, Thomas, House
E 1st N, Paris
11/18/1982
Paris MRA
82000308 (C)

Spencer, George, House
NE corner Center St. and N 1st E, Paris
11/18/1982
Paris MRA
82000309 (C)

Stoker, Henry, House and Outbuildings
192 S 2nd E, Paris
11/18/1982
Paris MRA
82000310 (C)

Stucki, J.U. House and Outbuildings
S. 1st West, Paris
4/13/1983
Paris MRA
83000275 (A, C)

Sutton, John, House
140 Main St., Paris
11/18/1982
Paris MRA
82000311 (C)

Taylor, Arthur, House
W 2nd N, Paris
11/18/1982
Paris MRA
82000312 (C)

Taylor's Candy Factory
SW corner Main St. and W 1st N, Paris
4/13/1983
Paris MRA
83000276 (C)

Telephone Company Bungalow
Center St. near Main St., Paris
11/18/1982
Paris MRA
82000313 (C)

Tueller, Jacob, Jr., House
75 S 1st E, Paris
11/18/1982
Paris MRA
82000314 (C)

Tueller, John, Sr., House
165 E 1st S., Paris
11/18/1982
Paris MRA
82000315 (C)

Wallentine Farmstead
NW of Paris, Paris vicinity
11/18/1982
Paris MRA
82000316 (C)

Wielermann, Gus, House
1 mi. SW of Paris, Paris vicinity
11/18/1982
Paris MRA
82000317 (C)

Wives of Charles C. Rich Historic District
S 1st West, Paris
11/18/1982
Paris MRA
82000318 (A, C)

ST. CHARLES

Nelson, Wilhelmina, House and Cabins
Main St. S, St. Charles
5/3/1976
76000668 (A, C)

BENEWAH COUNTY

CHATCOLET

Chatcolet CCC Picnic & Camping Area
ID SH 5, Heyburn State Park, Chatcolet vicinity
2/1/1995
94000632 (A, C)

Plummer Point CCC Picnic & Hiking Area
ID SH 5, Heyburn State Park, Chatcolet vicinity
2/1/1995
94001587 (A, C)

Rocky Point CCC Properties
ID SH 5, Heyburn State Park, Chatcolet vicinity
2/1/1995
94001588 (A, C)

DESMET

Coeur d'Alene Mission of the Sacred Heart
Off US Hwy. 95, DeSmet
4/21/1975
75000623 (A)

ST. MARIES

Benewah County Courthouse
7th and College Ave., St. Maries
9/22/1987
County Courthouses in Idaho MPS
87001580 (A, C)

Kootenai Inn
130 N. 9th, St. Maries
11/16/1979
79000774 (C)

St. Maries 1910 Fire Memorial
602 College Ave., St. Maries Cemetery, St. Maries
9/20/1984
North Idaho 1910 Fire Sites TR
84001010 (A)

St. Maries Masonic Hall #63
208 S. 8th St., St. Maries
9/23/2011
11000699 (A, C)

BINGHAM COUNTY

BLACKFOOT

Blackfoot I.O.O.F. Hall
57 W. Bridge St., Blackfoot
5/15/1979
79000775 (C)

Blackfoot LDS Tabernacle
120 S. Shilling Ave., Blackfoot
9/19/1977
77000456 (C)

Blackfoot Railway Depot
NW Main St., Blackfoot
11/20/1974
74000731 (A, C)

Eastern Idaho District Fair Historic District
97 Park Dr., Blackfoot
8/10/2001
01000864 (A)

Idaho Republican Building
167 W. Bridge, Blackfoot
10/16/1979
79000776 (A, C)

Jones, J.W., Building
104 NE Main, Blackfoot
11/17/1982
Tourtellotte and Hummel Architecture TR
82000319 (C)

North Shilling Historic District
N. Shilling Ave., Blackfoot
8/29/1979
79000777 (A, C)

Nuart Theater
195 N. Broadway, Blackfoot
10/19/1978
78001049 (A, C)

Shilling Avenue Historic District
Shilling Ave. between E. Idaho and Bingham Sts. And Bridge and Judicial Sts. To Stout Ave., Blackfoot
8/18/1983
83000278 (A, B, C)

St. Paul's Episcopal Church
72 N. Shilling Ave., Blackfoot
5/15/1979
79000778 (A, C)

Standrod Bank (Brown-Hart Store)
59 & 75 NW Main St., Blackfoot
8/30/1979
79000779 (A, C)

U.S. Post Office - Blackfoot Main
165 W. Pacific, Blackfoot
3/16/1989
US Post Offices in Idaho 1900-1941 MPS
89000128 (A, C)

FORT HALL

Fort Hall Site (United States Army, 1870-1883)
On Lincoln Cr., 16 mi. N of Fort Hall, Fort Hall vicinity
11/21/1974
74000732 (A, D)

Lincoln Creek Day School
Rich Ln., 8.0 mi. SE of SH 91, Fort Hall vicinity
4/9/2010
10000174 (A)

Ross Fork Episcopal Church
Mission Rd., E of Hwy. 91, Fort Hall
1/3/1983
Tourtellotte and Hummel Architecture TR
83000277 (C)

Ross Fork Oregon Short Line Railroad Depot
N side of Agency Rd., 0.5 mi. E of Fort Hall, Fort Hall
9/7/1984
84001019 (C)

BLAINE COUNTY

BELLEVUE

Bellevue Historic District
Roughly bounded by U.S. 93, Cedar, 4th, and Oak Sts., Bellevue
6/16/1982
82002506 (C)

Miller, Henry, house
S of Bellevue, off Hwy. 93, Bellevue vicinity
5/30/1975
75000624 (C)

CAREY

Fish Creek Dam
NE of Carey, Carey vicinity
12/29/1978
78003437 (A, C)

HAILEY

Blaine County Courthouse
Croy and First, Hailey
2/17/1978
78001050 (A, C)

Chase, Eben S. and Elizabeth S., House
203 E. Bullion St., Hailey
5/5/2009
09000292 (A)

Emmanuel Episcopal Church
101 2nd Ave. S., Hailey
10/5/1977
77000457 (C)

Fox, J.C., Building
115 S. Main St., Hailey
3/31/1983
83000279 (C)

Fox-Worswick House
119 E. Bullion St., Hailey
8/31/2011
11000613 (A)

Hailey Masonic Lodge #16
100 S. 2nd Ave., Hailey
9/12/2008
08000869 (A)

Hailey Methodist Episcopal Church
200 2nd Avenue South, Hailey
1/24/2017
100000560 (C)

Pound, Homer, House
314 2nd Ave. S., Hailey
12/28/1978
78001051 (B, C)

Rialto Hotel
201 S. Main St., Hailey
12/30/2009
09001162 (A)

St. Charles of the Valley Catholic Church
Pine and S. 1st St., Hailey
11/17/1982
Tourtellotte and Hummel Architecture TR
82000321 (C)

Watt, W.H., Building
120 N. Main St., Hailey
3/31/1983
83000281 (C)

Werthheimer Building
101 S. Main St., Hailey
9/12/1985
85002160 (B, C)

KETCHUM

Bald Mountain Hot Springs
151 S. Main St., Ketchum
11/17/1982
Tourtellotte and Hummel Architecture TR
82000320 (C)

Cold Springs Pegram Truss Railroad Bridge
Approx. .5 mi. S of jct. US 93 & SH 267, Ketchum vicinity
7/25/1997
Pegram Truss Railroad Bridges of Idaho MPS
97000762 (C)

Gimlet Pegram Truss Railroad Bridge
.5 mi. S of jct. US 93 and E. Fk. Wood River Road, Ketchum vicinity
7/25/1997
Pegram Truss Railroad Bridges of Idaho MPS
97000757 (C)

Greenhow and Rumsey Store Building
211 N. Main St., Ketchum
8/18/1983
83000280 (C)

Hemingway, Ernest and Mary, House
Address Restricted, Ketchum
3/13/2015
13001073 (B)

Ketchum Ranger District Administrative Site
bordered by Washington Ave., 1st Ave. S., 1st St. E. and River St., Ketchum
2/7/2007
07000005 (A, C)

SUN VALLEY

Proctor Mountain Ski Lift
Fairways Subdivision # 2, Sun Valley
1/2/1980
80001294 (A, C)

Sawtooth City
Address Restricted, Sun Valley vicinity
4/4/1975
75000625 (D)

BOISE COUNTY

IDAHO CITY

Arrowrock Dam
About 10 mi. E of Boise, Idaho City vicinity
11/9/1972
72000437 (A, C)

Idaho City Historic District
Bounded by city limits, Idaho City
6/27/1975
75000626 (A, C)

PLACERVILLE

Placerville Historic District
Roughly bounded by townsite limits, Placerville
9/7/1984
84001029 (A, C)

SWEET

Upper Brownlee School
Dry Buck Road, 0.1 mi. NE of Timber Butte Rd., Sweet vicinity
3/31/1998
Public School Buildings in Idaho MPS
98000264 (A, C)

BONNER COUNTY

COOLIN

Vinther and Nelson Cabin
Eight Mile Island, Coolin vicinity
7/21/1982
82002507 (C)

DOVER

Dover Church
Washington St., between 3rd and 4th, Dover
8/8/1989
86002153 (A)

PRIEST RIVER

Hotel Charbonneau
207 Wisconsin, Priest River vicinity
11/19/1991
91001718 (A)

Lamb Creek School
28769 N. Hwy 57, Priest River vicinity
11/30/1999
Public School Buildings in Idaho MPS
99001418 (A)

Priest River Commercial Core Historic District
Roughly bounded by Wisconsin, Montgomery, and Cedar Sts. And Albeni Rd., Priest River
8/31/1995
95001057 (A)

Priest River High School
1020 W. Albeni Hwy, Priest River
12/7/1995
Public School Buildings in Idaho MPS
95001402 (A, C)

Settlement School
Settlement Rd., 0.5 mi. E of jct. With East Side Rd., Priest River vicinity
4/1/1999
Public School Buildings in Idaho MPS
99000418 (A, C)

SANDPOINT

Bernd, W.A., Block
307-311 N. 1st Ave, Sandpoint
8/18/1983
83000282 (C)

Nesbitt, Amanda, House
602 N. 4th Ave, Sandpoint
7/15/1982
82002508 (C)

Olson, Charles A. and Mary, House
401 Church St., Sandpoint
5/30/2001
01000566 (C)

Priest River Experimental Forest Historic District
Idaho Panhandle National Forest, Sandpoint vicinity
7/1/1994
94000661 (A, C)

Sandpoint Burlington Northern Railway Station
Railroad Ave. at end of Cedar Street footbridge over Sand Creek, Sandpoint
7/5/1973
73000682 (A, C)

Sandpoint Community Hall
204 S. 1st Ave., Sandpoint
9/11/1986
86002148 (C)

Sandpoint Federal Building
419 N. 2nd Ave., Sandpoint
8/8/2001
01000836 (C)

Sandpoint High School
102 S. Euclid Avenue, Sandpoint
10/28/1999
Public School Buildings in Idaho MPS
99001277 (A, C)

Sandpoint Historic District
Roughly 1st and 2nd Aves., Main and Cedar Sts., Sandpoint
9/7/1984
84001100 (A, C)

BONNEVILLE COUNTY

IDAHO FALLS

Art Trounter Houses Historic District
3950, 4032, 4012 S. 5th W., Idaho Falls
9/10/2008
08000868 (C)

Beckman, Andrew and Johanna M., Farm
US 20 0.5 mi. W of jct. with New Sweden Rd., Idaho Falls
5/5/1992
New Sweden and Riverview Farmsteads and Institutional Buildings MPS
92001414 (A, C)

Beckman, Oscar & Christina, Farmstead
SW Corner New Sweden - Shelley Rd. & US 20, Idaho Falls
11/19/1991
New Sweden and Riverview Farmsteads and Institutional Buildings MPS
91001713 (A, C)

Bonneville County Courthouse
605 Capital Ave., Idaho Falls
7/10/1979
79000781 (A, C)

Bonneville Hotel
410 Constitution Wy. (400 Block W. C St.), Idaho Falls
8/30/1984
Idaho Falls Downtown MRA
84001032 (C)

Douglass-Farr Building
493 N. B Ave. (493 N. Capital Ave.), Idaho Falls
8/30/1984
Idaho Falls Downtown MRA
84001035 (C)

Eagle Rock Ferry
Snake River, Idaho Falls
6/7/1974
74000734 (A)

Eleventh Street Historic District
Roughly bounded by S. Boulevard, 13th, 10th, and 9th Sts., S. Emerson and S. Lee Aves., Idaho Falls
8/8/1997
97000863 (A, C)

Farmers and Merchants Bank Building
396 Park Ave. / 383 W. A St., Idaho Falls
8/30/1994
Idaho Falls Downtown MRA
84001037 (C)

First Presbyterian Church
325 Elm St., Idaho Falls
3/29/1978
78001052 (C)

Hasbrouck Building
362 Park Ave., Idaho Falls
8/30/1984
Idaho Falls Downtown MRA
84001039 (C)

Holy Rosary Church
228 E. 9th St., Idaho Falls
7/17/2002
02000802 (C)

Hotel Idaho
482 W. C St. (482 Constitution Wy.), Idaho Falls
8/30/1984
Idaho Falls Downtown MRA
84001042 (C)

I.O.O.F. Building
393 N. Park Ave., Idaho Falls
8/30/1984
Idaho Falls Downtown MRA
84001090 (C)

Idaho Falls Airport Historic District
2381 Foote Dr., Idaho Falls
9/10/1997
97001126 (A)

Idaho Falls City Building
308 W. Constitution St. (308 W. C St.), Idaho Falls
8/30/1984
Idaho Falls Downtown MRA
84001092 (C)

Idaho Falls Public Library
N. Yellowstone Ave. (Elm and Eastern Sts.), Idaho Falls
8/30/1984
Idaho Falls Downtown MRA
84001093 (C)

Kress Building
451-455 N. Park Ave., Idaho Falls
8/30/1984
Idaho Falls Downtown MRA
84001095 (C)

Montgomery Ward Building
504-520 Shoup Ave., Idaho Falls
6/30/1996
Idaho Falls Downtown MRA
84001096 (C)

New Sweden School
New Sweden School Road and Mill Road, Idaho Falls
11/19/1991
New Sweden and Riverview Farmsteads and Institutional Buildings MPS
91001714 (A, C)

Ridge Avenue Historic District
Roughly bounded by N. Eastern Ave., Birch St., S. Boulevard, Ash St., W. Placer Ave., and Pine St., Idaho Falls
5/20/1993
93000388 (A, C)

Rocky Mountain Bell Telephone Co. Building
246 W. Broadway, Idaho Falls
8/30/1984
Idaho Falls Downtown MRA
84001099 (A, C)

Sealander, Carl S. and Lizzie, Farmstead
W end St. John Rd., Idaho Falls
5/5/1992
New Sweden and Riverview Farmsteads and Institutional Buildings MPS
92000414 (A, C)

Shane Building
381 N. Shoup Ave., Idaho Falls
8/30/1994
Idaho Falls Downtown MRA
84001101 (C)

Trinity United Methodist Church
237 N. Water Ave., Idaho Falls
12/16/1977
77000458 (C)

U.S. Post Office - Idaho Falls
591 Park Ave., Idaho Falls
5/31/1979
79000782 (A, C)

Underwood Hotel
347-349 Constitution Wy. (343-349 W. C St.), Idaho Falls
8/30/1984
Idaho Falls Downtown MRA
84001102 (C)

Wasden Site (Owl Cave)
Address Restricted, Idaho Falls vicinity
5/24/1976
76000669 (D)

IONA

Iona Meetinghouse
SE corner of Main St. and Rockwood Ave., Iona
5/7/1973
73000681 (C)

RIRIE

Shelton LDS Ward Chapel
.5 mi N of US Hwy 26 on Shelton Rd., Ririe
8/30/1979
79000783 (C)

WAYAN

Salt River Hydroelectric Powerplant (Canal)
Lincoln County Road 12-104, Wayan
12/2/1993
93000889 (A)

BOUNDARY COUNTY

BONNERS FERRY

Boundary County Courthouse
Kootenai St., Bonners Ferry
9/27/1987
County Courthouses in Idaho MPS
87001581 (A, C)

Fry's Trading Post
off US 95, Bonners Ferry
9/7/1984
84001104 (A)

Harvey Mountain Quarry
Address Restricted, Bonners Ferry vicinity
6/23/1978
78001053 (D)

Northside School
6497 Comanche St., Bonners Ferry
5/5/1992
Public School Buildings in Idaho MPS
92000417 (A, C)

Soderling, Russell and Pearl, House
217 W. Madison St., Bonners Ferry
1/15/1998
97001650 (C)

U.S. Post Office - Bonners Ferry Main
7167 1st St., Bonners Ferry
3/16/1989
US Post Offices in Idaho 1900-1941 MPS
89000129 (A, C)

EASTPORT

Snyder Guard Station Historic District
S of Eastport, on Forest Rd. #211 (County Rd. #34), Eastport vicinity
8/19/1983
83000283 (A, C)

Spokane International Railroad Construction Camp
E of US 95 along the Spokane & International RR tracks, 2 mi. S. of the U.S-Canadian border, Eastport vicinity
6/23/1994
94000630 (C, D)

PORTHILL

U.S. Inspection Station - Porthill, Idaho
SH 1, Porthill
5/22/2014
U.S. Border Inspection Stations
14000252 (A, C)

BUTTE COUNTY

ARCO

Arco Baptist Community Church
402 W. Grand Ave., Arco
11/29/2001
01001303 (C)

Aviator's Cave
Address Restricted, Arco vicinity
7/22/2010
09001224 (D)

Experimental Breeder Reactor No. 1
INEEL, approx. 40 mi. W of Idaho Falls, Arco vicinity
10/16/1966
National Historic Landmark
66000307 (A)

Goodale's Cutoff
S. of Arco off US 20; near Craters of the Moon, Arco vicinity
1/5/1974
74000735 (A)

CAMAS COUNTY

FAIRFIELD

Skillern, John, House
25 mi. NW of Fairfield, near the confluence of Big Smokey and Little Smokey creeks, Fairfield vicinity
5/14/1984
84001111 (A, C)

CANYON COUNTY

CALDWELL

Beale, F. F., House
1802 E. Cleveland Blvd., Caldwell
5/14/1993
93000386 (B)

Blatchley Hall
College of Idaho campus, Caldwell
3/8/1978
78001055 (A, B, C)

Boise River and Canal Bridge
Plymouth St. (Old Hwy. 30), Caldwell
2/7/2007
Metal Truss Highway Bridges of Idaho MPS
07000003 (C)

Caldwell Carnegie Library
1101 Cleveland Blvd., Caldwell
6/18/1979
79000784 (A, C)

Caldwell Historic District
Roughly bounded by Railroad and Arthur Sts., 7th and 9th Aves., Caldwell
7/19/1982
82002509 (A, C)

Caldwell Odd Fellows Home for the Aged
N. 14th Avenue, Caldwell
11/17/1982
Tourtellotte and Hummel Architecture TR
82000322 (C)

Caldwell Residential Historic District
Roughly bounded by Cleveland Blvd., Everett St., S. 12th Ave., and S. 20th Ave., Caldwell
9/23/2002
02001064 (A, C)

Dorman, Henry W. and Ida Frost, house
114 Logan St., Caldwell
7/5/2000
00000756 (A, C)

Little, Thomas K., House
703 E. Belmont St., Caldwell
8/18/1980
80001295 (B, C)

North Caldwell Historic District
9th, Albany and Belmont Sts., Caldwell
9/5/1979
79000785 (A, B, C)

Rice, John C., House
1520 Cleveland Blvd., Caldwell
5/27/1980
80001296 (B, C)

St. Mary's Catholic Church
616 Dearborn, Caldwell
11/17/1982
Tourtellotte and Hummel Architecture TR
82000332 (C)

Sterry Hall
College of Idaho campus, Caldwell
3/18/1978
78001056 (A, C)

Steunenberg, A.K., House
409 N. Kimball, Caldwell
11/17/1982
Tourtellotte and Hummel Architecture TR
82000335 (C)

Strahorn, Carrie Adell, Memorial Library
College of Idaho campus, Caldwell
4/12/1982
82002510 (C)

U.S. Post Office - Caldwell Main
823 Arthur St., Caldwell
3/16/1989
US Post Offices in Idaho 1900-1941 MPS
89000131 (A, C)

GIVENS HOT SPRINGS

Map Rock Petroglyphs Historic District
Address Restricted, Givens Hot Springs vicinity
9/8/1982
82000325 (C, D)

MIDDLETON

Middleton Substation
ID Hwy 44, Middleton
5/7/1973
73000683 (A, C)

NAMPA

Deer Flat Embankment and Diversion Dam
SW of Nampa at Lake Lowell (embankment), Nampa vicinity
3/15/1976
72001610 (A, C)

Dewey, E. H., Stores
1013-1015 1st St. S., Nampa
11/17/1982
Tourtellotte and Hummel Architecture TR
82000323 (C)

Farmers & Merchants Bank
101 11th Ave. S., Nampa
5/13/1976
76000670 (A, C)

Horse Barn
NE of Nampa at Idaho State School and Hospital, Nampa vicinity
11/10/1978
78001057 (A, C)

Idaho State Sanitarium Administration Building
1660 11th Ave., Nampa vicinity
11/17/1982
Tourtellotte and Hummel Architecture TR
82000324 (C)

Lockman, Jacob P., House
23 9th Ave. N., Nampa
7/27/2005
05000735 (C)

Mercy Hospital
1615 8th St. S., Nampa
8/19/2014
14000504 (A)

Nampa American Legion Chateau
1508 2nd St. S., Nampa vicinity
11/17/1982
Tourtellotte and Hummel Architecture TR
82000324 (C)

Nampa and Meridian Irrigation District Office
1503 1st St. S., Nampa
11/17/1982
Tourtellotte and Hummel Architecture TR
82000329 (C)

Nampa City Hall
203 12th Ave. S., Nampa
5/9/1985
85000967 (A, C)

Nampa Department Store
1st St. S. and 13th Ave., Nampa
11/17/1982
Tourtellotte and Hummel Architecture TR
82000327 (C)

Nampa Depot
1200 Front St., Nampa
11/3/1972
72000438 (C)

Nampa First Methodist Episcopal Church
12th Ave. & 4th, Nampa
11/17/1982
Tourtellotte and Hummel Architecture TR
82000328 (C)

Nampa Historic District
1200 and 1300 blocks 1st St. S., Nampa
8/18/1983
83000284 (C)

Nampa Presbyterian Church
1423 2nd St. S., Nampa
11/17/1982
Tourtellotte and Hummel Architecture TR
82000330 (C)

Nampa Valley Grange #131
203 5th Ave. S., Nampa
2/13/2013
13000002 (A)

Old Nampa Neighborhood Historic District
Roughly bounded by 4th Ave. S., 4th St. S., 11th Ave. S., and 9th St. S., Nampa
3/21/2007
07000164 (A, C)

St. Paul's Rectory and Sisters' House
810 15th. Ave. S., Nampa
11/17/1982
Tourtellotte and Hummel Architecture TR
82000333 (C)

U.S. Post Office - Nampa Main
123 11th Ave. S., Nampa
3/16/1989
US Post Offices in Idaho 1900-1941 MPS
89000132 (A, C)

Wiley, H. Orton, House
524 E. Dewey, Nampa
9/11/1986
86002163 (A)

PARMA

Fort Boise (Hudson's Bay Company) and Riverside Ferry
on Snake River, NW of Parma, Parma vicinity
12/24/1974
74000736 (A)

Sacred Hearts of Jesus and Mary Catholic Church
612 N. 7th, Parma
11/17/1982
Tourtellotte and Hummel Architecture TR
82000334 (C)

Stewart, A. H., House
3rd and Bates, Parma
10/25/1979
79000786 (C)

ROSWELL

Roswell Grade School
Hwy 18 and Stephan Lane, Roswell
11/17/1982
Tourtellotte and Hummel Architecture TR
82000331 (A, C)

WILDER

Houlder, Ellen, Farm
Rt. 2, Arena Valley Rd., Wilder
6/23/1994
94000641 (A, C)

Obendorf, George, Gothic Arch Truss Barn
24047 Batt Corner Rd., Wilder vicinity
10/28/1999
99001278 (C)

Peckham Barn
U.S. Highway 95, N of Wilder, Wilder vicinity
10/7/1982
82000389 (A, C)

CARIBOU COUNTY

CHESTERFIELD

Chesterfield Historic District
Town of Chesterfield, Chesterfield
12/4/1980
80001297 (A, C)

GRACE

Grace Pegram Truss Railroad Bridge
approx. 0.5 mi. NNW of jct. SH 34 and Turner Rd., Grace vicinity
7/25/1997
Pegram Truss Railroad Bridges of Idaho MPS
97000758 (C)

SODA SPRINGS

Caribou County Courthouse
159 S. Main, Soda Springs
9/22/1987
County Courthouses in Idaho MPS
87001582 (A, C)

Enders Hotel
76 S. Main St., Soda Springs
5/14/1993
93000384 (A, C)

Hopkins, William, House
300 blk. E Hooper Ave., Soda Springs
1/8/1979
79000787 (C)

Lander Road
NE of Soda Springs in Caribou National Forest, S of ID 34, Soda Springs vicinity
4/24/1975
75000627 (A)

Largilliere, Edgar Walter Sr., House
30 W. 2nd S. St., Soda Springs
12/23/1991
91001870 (B, C)

Soda Springs City Hall
109 S. Main St., Soda Springs
5/14/1993
93000385 (A, C)

CASSIA COUNTY

ALBION

Albion Methodist Church
102 North St., Albion
9/4/1986
86002161 (C)

Albion Normal School Campus
Off ID 77, Albion, Albion
11/28/1980
80001298 (A, C)

Swanger Hall, Albion Normal School Campus
off ID 77, Albion Normal School Campus, Albion
9/20/1978
78001058 (A, C)

ALMO

City of Rocks
1.5 mi. W of Almo, 2 mi. N of Utah border, Almo vicinity
10/15/1966
National Historic Landmark
66000308 (A)

BURLEY

Cassia County Courthouse
15th St. & Overland Ave., Burley
9/27/1987
County Courthouses in Idaho MPS
87001583 (A, C)

Granite Pass
Approx. 0.5 mi. N of Utah-Idaho Border, SW of Burley, Burley vicinity
6/28/1972
72000439 (A)

OAKLEY

Oakley Historic District
Main St. and Wilson Ave., Oakley
11/28/1980
80001299 (A, C)

CLARK COUNTY

BLUE DOME

Birch Creek Rockshelters
Address Restricted, Blue Dome vicinity
12/2/1974
74000737 (D)

DUBOIS

St. James' Episcopal Mission Church
Reynolds St. and Old Hwy. 91, Dubois
5/14/1993
93000387 (C)

KILGORE

Camas Meadows Camp and Battle Sites
E if Kilgore, Kilgore vicinity
4/11/1989
National Historic Landmark, Nez Perce National Historical Park
89001081 (A)

SPENCER

Spencer Rock House
Off U.S. 91 at Huntley Canyon, Spencer
11/30/1989
89001991 (A, C)

CLEARWATER COUNTY

OROFINO

Orofino Historic District
2nd, Dewey, Main, Johnson, and 6th Sts., Orofino
10/29/1982
82000384 (A, C)

U.S. Post Office - Orofino Main
320 Michigan Ave., Orofino
3/16/1989
US Post Offices in Idaho 1900-1941 MPS
89000133 (A, C)

PIERCE

Moore Gulch Chinese Mining Site
Address Restricted, Pierce vicinity
12/20/1982
83000285 (A, D)

Pierce Courthouse
ID 11, Pierce
11/3/1972
Nez Perce National Historical Park
72000100 (A)

WEIPPE

Brown's Creek CCC Camp Barracks
105 1st St. E, Weippe
7/5/1984
84001114 (A, C)

Weippe Prairie
S of Weippe on ID 11, Weippe vicinity
10/15/1966
National Historic Landmark, Nez Perce National Historical Park
66000311 (A)

CUSTER COUNTY

CHALLIS

Bayhorse
S of Challis off U.S. 93, Challis
3/15/1976
76000671 (A, C)

Board & Batten Commercial Building
Main Avenue, Challis
12/3/1980
Challis MRA
80001300 (C)

Building at Pleasant Avenue
247 Pleasant Avenue, Challis
12/3/1980
Challis MRA
80001301 (C)

Buster Meat Market
Main Avenue, Challis
12/3/1980
Challis MRA
80004551 (C)

Bux's Place
321 Main Avenue, Challis
12/3/1980
Challis MRA
80001302 (C)

Challis Archaeological Spring District
Address Restricted, Challis vicinity
2/12/1981
81000206 (D)

Challis Bison Jump Site
Address Restricted, Challis vicinity
10/30/1975
75000628 (D)

Challis Brewery Historic District
Challis Creek Rd., Challis
2/5/1980
80001303 (A, C)

Challis Cold Storage
Main Avenue, Challis
12/3/1980
Challis MRA
80001304 (C)

Challis High School
Main Ave., Challis
12/3/1980
Challis MRA
80001305 (C)

Chivers, Bill, House
3rd Street, Challis
12/3/1980
Challis MRA
80001306 (C)

Chivers, Thomas, Cellar
Challis Creek Road, Challis
12/3/1980
Challis MRA
80001307 (C)

Chivers, Thomas, House
Challis Creek Road, Challis
12/3/1980
Challis MRA
80001308 (C)

Custer County Jail
Main Ave., Challis
12/3/1980
Challis MRA
80001309 (C)

False-Front Commercial Building
Main Avenue, Challis
12/3/1980
Challis MRA
80001310 (C)

Hosford, Emmett, House
3rd Street, Challis
12/3/1980
Challis MRA
80001311 (C)

I.O.O.F. Hall
Main Avenue, Challis
12/3/1980
Challis MRA
80001312 (C)

McKendrick House
4th Street, Challis
12/3/1980
Challis MRA
80001313 (C)

Old Challis Historic District
Bounded by Valley and Pleasant Aves., 2nd and 3rd Sts., Challis
12/3/1980
Challis MRA
80001314 (C)

Peck, Bill, House
16 Main Street, Challis
12/3/1980
Challis MRA
80001315 (C)

Penwell House
North Avenue, Challis
12/3/1980
Challis MRA
80001316 (C)

Rowles, Donaldson, House
North Avenue, Challis
12/3/1980
Challis MRA
80001317 (C)

Smith, Henry, House
5th Street, Challis
12/3/1980
Challis MRA
80001318 (C)

Stone and Log Building
Pleasant Avenue, Challis
12/3/1980
Challis MRA
80001320 (C)

Stone Building
3rd Street, Challis
12/3/1980
Challis MRA
80001319 (C)

Twin Peaks Sports
Main Ave. and 5th St., Challis
12/3/1980
Challis MRA
80001321 (C)

Wilkinson, Clyde, House
9th Street, Challis
12/3/1980
Challis MRA
80001322 (C)

CLAYTON

East Fork Lookout
Address Restricted, Clayton vicinity
9/27/1976
76000672 (D)

Idaho Mining and Smelter Company Store
One Ford St., Clayton
2/1/2006
05001601 (A)

CUSTER

Custer Historic District
Address Restricted, Custer
2/3/1981
81000207 (C)

MACKAY

Mackay Episcopal Church
SW corner of Park Ave. and College, Mackay
11/17/1982
Tourtellotte and Hummel Architecture TR
82000336 (C)

Mackay Methodist Episcopal Church
Park and Custer Street, Mackay
9/7/1984
84001118 (A, C)

STANLEY

Day, Ivan W. "Doc", Cabin
Forest Service Rd. #653, Stanley
4/9/1986
86000754 (A, C)

Idaho Rocky Mountain Club
Highway 75, Stanley vicinity
12/9/1994
94001451 (A)

Niece Brothers' store
Ace of Diamonds Street, Stanley
6/12/1995
95000667 (A)

Redfish Archaeological District
Address Restricted, Stanley vicinity
12/2/1983
83003574 (D)

Stanley Ranger Station
S.H. 75, jct. of Valley Creek and Main Salmon River, Stanley vicinity
12/2/1982
82001885 (A, C)

ELMORE COUNTY

ATLANTA

Atlanta Dam and Power Plant
2 mi. W of Atlanta on Middle Fk. of Boise River below Yuba River jct., Atlanta
10/5/1977
77000459 (C)

Atlanta Historic District
Middle Fk. of the Boise River, Boise National Forest, Atlanta
4/6/1978
78001059 (C)

Atlanta Ranger Station Historic District
At end of Middle Fork Rd., Boise NF, Atlanta
1/23/2003
02001726 (A, C)

GLENNS FERRY

Amstutz Apartments
320 S. Ada St., Glenns Ferry
9/23/1982
82002511 (A, C)

Glenns Ferry School
Cleveland St. between Ada and Owyhee sts., Glenns Ferry
9/7/1984
84001122 (A, C)

Gorby Opera Theater
Idaho Ave. near Logan, Glenns Ferry
11/17/1982
Tourtellotte and Hummel Architecture TR
82000339 (C)

McGinnis, J. J., Building
1st & Commercial, Glenns Ferry
11/17/1982
Tourtellotte and Hummel Architecture TR
82000340 (C)

O'Neill Brothers Building
Idaho Ave. near Commercial, Glenns Ferry
11/17/1982
Tourtellotte and Hummel Architecture TR
82000342 (C)

Our Lady of Limerick Catholic Church
114 W. Arthur, Glenns Ferry
11/17/1982
Tourtellotte and Hummel Architecture TR
82000343 (C)

MOUNTAIN HOME

Ake, F. P., Building
106-172 Main St., Mountain Home
11/17/1982
Tourtellotte and Hummel Architecture TR
82000337 (C)

Anchustegui, Pedro, Pelota Court
W. 2nd St. N., Mountain Home
1/30/1978
78001060 (A)

Elmore County Courthouse
150 S. 4th E., Mountain Home
9/22/1987
County Courthouses in Idaho MPS
87001584 (A, C)

Father Lobell House
125 4th St. E., Mountain Home
11/17/1982
Tourtellotte and Hummel Architecture TR
82000338 (C)

KwikCurb Diner
850 S. 3rd W., Mountain Home
7/26/2010
10000502 (C)

Mountain Home Baptist Church
265 N. 4th E., Mountain Home
11/17/1982
Tourtellotte and Hummel Architecture TR
82000341 (C)

Mountain Home Carnegie Library
180 S. 3rd St. E, Mountain Home
7/24/1978
78001061 (A, C)

Mountain Home High School
550 E. Jackson, Mountain Home
8/8/1991
Public School Buildings in Idaho MPS
91000988 (A, C)

Mountain Home Hotel
195 N. 2nd St. W, Mountain Home
10/29/1982
82000385 (C)

St. James Episcopal Church
305 N. 3rd St. E., Mountain Home
10/5/1977
77000460 (C)

Turner Hotel
140-170 E. Jackson St./105-115 N. 2nd E. St., Mountain Home
9/7/1984
84001124 (C)

ROCKY BAR

South Boise Historic Mining District
In Boise and Sawtooth National Forests, Rocky Bar
12/30/1975
75000629 (A)

FRANKLIN COUNTY

FRANKLIN

Franklin City Hall
128 E. Main St., Franklin
11/19/1991
91001716 (A, C)

Franklin Co-operative Mercantile Institution
113 E. Main St., Franklin
11/19/1991
91001717 (A, C)

Hatch, Lorenzo Hill, house
E of 113 Main St., mid-block between N 1st E & N 2nd E, Franklin
5/7/1973
73000684 (C)

Relic Hall
111 E. Main St., Franklin
1/11/2001
00001627 (C)

PRESTON

Bear River Battleground
NW of Preston of US Hwy. 91, Preston vicinity
6/21/1990
National Historic Landmark
73000685 (A)

Cowley, Mathias, House
110 S. 1st East, Preston
7/19/1976
76000673 (C)

Franklin County Courthouse
39 W. Oneida, Preston
7/27/1987
County Courthouses in Idaho MPS
87001585 (A, C)

Oneida Stake Academy
SW corner of E. Oneida St. and S. 1st East St., Preston
5/21/1975
75000630 (A, C)

U.S. Post Office - Preston Main
55 E. Oneida St., Preston
3/16/1989
US Post Offices in Idaho 1900-1941 MPS
89000135 (A, C)

WESTON

Weston Canyon Rockshelter
Address Restricted, Weston vicinity
7/25/1974
74000738 (D)

FREMONT COUNTY

ASHTON

Independent Order of Odd Fellows Hall
NE Corner 6th Ave & Main St. (14 N. 6th), Ashton
7/9/1997
97000763 (A, C)

GRAINVILLE

Conant Creek Pegram Truss Railroad Bridge
1.0 mi. S of jct. Of Squirrel Rd. and Old Ashton-Victor railroad spur line, Grainville vicinity
7/25/1997
Pegram Truss Railroad Bridges of Idaho MPS
97000756 (C)

ISLAND PARK

Big Falls Inn
Targhee National Forest, Forest Hwy. #295, W bank of Henrys Fk. At Upper Mesa Falls, Island Park vicinity
5/31/2002
94000131 (C)

Bishop Mountain Lookout
F.S. Road 80120, Island Park vicinity
5/23/1986
86001184 (A, C)

Buffalo Lake Snowshoe Cabin (Fort Yellowstone Historic District NHL)
Bechler area, W boundary in the SW corner of Yellowstone National Park, Island Park vicinity
7/31/2003
03001032 (A)

Crabtree, Glen and Addie, Cabin
3939 Cowan Rd., Island Park
6/29/2000
00000742 (C)

Island Park Land and Cattle Company Home Ranch Historic District
U.S. 20, roughly 1 mi. SW of Island Park at Harriman State Park, Island Park vicinity
12/20/1996
96001508 (A)

Sack, Johnny, Cabin
Big Springs Loop, Island Park vicinity
4/19/1979
79000788 (C)

Sherwood, Joseph, House and Store
Hwy. 87, 3.9 mi. NW of Hwy. 20 & 87, Island Park vicinity
12/9/1994
94001452 (A)

ST. ANTHONY

Fremont County Courthouse
151 W. 1st St. N., St. Anthony
1/8/1979
79000789 (A, C)

Idaho State Industrial School Women's Dormitory
N. Parker Hwy., 1.5 mi. W of St. Anthony, St. Anthony vicinity
11/17/1982
Tourtellotte and Hummel Architecture TR
82000344 (C)

St. Anthony Pegram Truss Railroad Bridge
Approx. 0.5 mi. S of jct. of S. Parker Rd. and West Belt Branch RR tracks, over the Henrys Fk. of the Snake River, St. Anthony vicinity
7/25/1997
Pegram Truss Railroad Bridges of Idaho MPS
97000761 (C)

U.S. Post Office - St. Anthony Main
48 W. 1st N., St. Anthony
3/16/1989
US Post Offices in Idaho 1900-1941 MPS
89000136 (A, C)

GEM COUNTY

EMMETT

Bliss, F. T., house
321 E. 2nd, Emmett
11/17/1982
Tourtellotte and Hummel Architecture TR
82000345 (C)

Catholic Church of the Sacred Heart
1st and Hayes Ave., Emmett
12/3/1980
Early Churches of Emmett TR
80001323 (A, C)

Emmett Presbyterian Church
2nd at Wardwell Ave., Emmett
12/3/1980
Early Churches of Emmett TR
80001324 (A, C)

First Baptist Church of Emmett
1st and Hayes Ave., Emmett
12/3/1980
Early Churches of Emmett TR
80001325 (A, C)

Gem County Courthouse
415 E. Main, Emmett
11/17/1982
Tourtellotte and Hummel Architecture TR
82000347 (C)

Methodist Episcopal Church
1st and Washington, Emmett
12/3/1980
Early Churches of Emmett TR
80001326 (A, C)

Oregon Short Line Railway Depot
119 N. Commercial Ave., Emmett
4/27/1995
95000506 (A)

St. Mary's Episcopal Church
1st and Wardwell Ave., Emmett
12/3/1980
Early Churches of Emmett TR
80001327 (A, C)

OLA

Ola School
5 Ola School Rd., Ola
5/5/1992
Public School Buildings in Idaho MPS
92000415 (A, C)

SWEET

Sweet Methodist Episcopal Church
7200 Sweet-Ola Hwy., Sweet
7/9/1997
97000766 (A)

GOODING COUNTY

BLISS

Teater, Archie, Studio
4 mi. SE of Bliss, Bliss vicinity
9/13/1984
84001132 (B, C)

GOODING

Citizens State Bank
3rd Ave. and Main St., Gooding
5/7/1980
80001328 (C)

Gooding College Campus
S. of Hwy 26, Gooding
3/18/1983
Tourtellotte and Hummel Architecture TR
83000286 (A, C)

Kelly's Hotel
112 Main St., Gooding
9/12/1985
85002155 (A, C)

Schubert Theatre
402 Main St., Gooding
1/6/2004
Motion Picture Theater Buildings in Idaho MPS
03001367 (A)

Thompson Mortuary Chapel
737 Main St., Gooding
11/17/1982
Tourtellotte and Hummel Architecture TR
82000348 (C)

Trinity Episcopal Church
SE corner of 7th Ave. and Idaho St., Gooding
11/17/1982
Tourtellotte and Hummel Architecture TR
82000349 (C)

HAGERMAN

Hagerman State Bank, Limited
100 S. State St., Hagerman
8/11/1989
89001000 (A, C)

Owsley Bridge
c. 200 yrds N of jct Old US 30/Bell Rapid Rd, Hagerman vicinity
9/18/1998
98001172 (A, C)

Priestley's Hydraulic Ram
6 mi. S of Hagerman at Thousand Springs, Hagerman vicinity
2/13/1975
75000631 (A, C)

Roberts, Morris, Store
111 W Hagerman Ave, Hagerman
4/17/1978
78001062 (A, C)

WENDELL

Mays, James Henry & Ida Owen, House
N bank Snake River, 1.2 mi W of Wendell, Wendell vicinity
3/9/1993
92001412 (A)

West Point Grade School
off I-86, Wendell vicinity
11/17/1982
Tourtellotte and Hummel Architecture TR
82000350 (C)

IDAHO COUNTY

BURGDORF

Burgdorf
About 15 mi. W of Warren, Burgdorf vicinity
4/14/1972
72000441 (A)

Carey Dome Fire Lookout
On Forest Road #318, approx. 9.0 mi. N of Burgdorf G.S., Burgdorf vicinity
3/25/1994
94000268 (A)

COTTONWOOD

Baker, James V. and Sophia, house
204 Broadway St., Cottonwood
1/6/2004
03001366 (A, C)

Lower Salmon River Archaeological District
Address Restricted, Cottonwood vicinity
8/5/1986
86002170 (A, C, D)

St. Gertrude's Convent & Chapel
W of Cottonwood, Cottonwood vicinity
6/18/1979
79000790 (A, C)

DARBY, MT

Deep Creek (Magruder) Ranger Station
West Fork Rd., West Fork Ranger District, Bitterroot National Forest, Darby, MT vicinity
12/11/2013
13000902 (A, C)

DIXIE

Moore, Jim, Place
Salmon River Canyon at River Mile 148.1, Dixie vicinity
3/29/1978
78001063 (A)

ELK CITY

Elk City Wagon Road - Victory Gulch/Smith Grade Segment
Nez Perce National Forest, Elk City vicinity
5/21/2001
Elk City Wagon Road MPS
01000536 (A)

Gold Point Mill
8.0 mi. SE of Elk City on Forest Service Rd. 222, Elk City vicinity
7/14/2000
00000792 (A, C)

Meinert Ranch Cabin
1.8 mi SW of Red River Hot Springs on Red River-Beargrass Rd. No. 234, Elk City vicinity
9/23/1987
87001561 (A, B, C)

GRANGEVILLE

Blue Fox Theatre
116 W. Main St., Grangeville
11/30/1999
Motion Picture Theater Buildings in Idaho MPS
99001412 (A)

Moose Creek Administrative Site
Confluence of the Selway River and Moose Cr., Nez Perce National Forest, Selway-Bitterroot Wilderness, Grangeville vicinity
6/25/1990
90000932 (A, C)

Tolo Lake
W of Grangeville on Tolo Lake Rd., Grangeville vicinity
2/7/2011
10001200 (A)

KAMIAH

First Indian Presbyterian Church and Nikesa Cemetery
N of East Kamiah on E side of US 12, Kamiah vicinity
5/13/1976
76000674 (C)

McBeth, Sue, Cabin
N of East Kamiah on W side of US 12, Kamiah vicinity
6/3/1976
76000675 (A, C)

KOOSKIA

Big Cedar School
947 Red Fir Rd., Kooskia vicinity
11/29/2016
Public School Buildings in Idaho MPS
16000806 (A, C)

Fenn Ranger Station
HC 75, Box 91, 7 mi. E of Lowell on Selway River Rd., Kooskia
6/18/1990
90000931 (A, C)

Lochsa Historical Ranger Station
Address Restricted, Kooskia vicinity
6/9/1978
78001065 (A, C)

State Bank of Kooskia
1 S. Main St., Kooskia
5/24/1978
78001067 (C)

LUCILE

Elfers, Jurden Henry, Barn and Field
approx. 3.5 mi. N of Lucile on John Day Creek, Lucile vicinity
6/7/2007
07000544 (A)

MCCALL

Arctic Point Fire Lookout
10 mi NE of USFS Chamberlain Guard Station, McCall vicinity
8/29/1994
94001019 (A)

Chamberlain Ranger Station Historic District
NE of McCall, Frank Church-River of No Return Wilderness, Payette National Forest, McCall vicinity
7/31/2003
03001388 (A)

Cold Meadows Guard Station
14 mi. SE of Arctic Point Lookout, Frank Church River of No Return Wilderness, McCall vicinity
8/19/1994
94001017 (C)

RIGGINS

Aitken Barn
US Hwy. 95, M.P. 194.2, S of Riggins, Riggins vicinity
8/9/1982
82002512 (C)

Bemis, Polly, Cabin
17 mi. by boat up Salmon River, Riggins vicinity
3/4/1988
87002152 (A, C)

Campbell's Ferry
SE bank of Salmon River at Mile 148, Frank Church River of No Return Wilderness, Riggins vicinity
2/8/2007
07000037 (A, B)

Riggins Motel
615 S. Hwy 95, Riggins
9/14/2001
01000979 (C)

Yawwinma Traditional Cultural Property (Rapid River)
143 Rapid River Road, Riggins vicinity
6/12/2017
(A)

SHOUP

Foster, Blacky, House
along Salmon River W of Shoup, Shoup vicinity
4/10/1992
92000307 (A, C)

WARREN

Ah Toy Garden
along China Cr. Near jct. with S. Fk. Of the Salmon River, Warren vicinity
6/27/1990
Chinese Sites in the Warren Mining District MPS
90000893 (A)

Celadon Slope Garden
along China Cr. Near jct. with S. Fk. Of the Salmon River, Warren vicinity
6/27/1990
Chinese Sites in the Warren Mining District MPS
90000891 (A)

Chinese Cemetery
.5 mi NW of Warren Wagon Rd., Warren vicinity
3/29/1994
Chinese Sites in the Warren Mining District MPS
94000270 (A)

Chinese Mining Camp Archaeological Site
NW of Warren, Payette NF, Warren vicinity
9/4/1994
Chinese Sites in the Warren Mining District MPS
94001018 (D)

Chi-Sandra Garden
along China Cr. Near jct. with S. Fk. Of the Salmon River, Warren vicinity
6/27/1990
Chinese Sites in the Warren Mining District MPS
90000892 (A)

Old China Trail
along China Cr. Near jct. with S. Fk. Of the Salmon River, Warren vicinity
6/27/1990
Chinese Sites in the Warren Mining District MPS
90000894 (A)

Warren Guard Station, Bldg. 1206
Forest Hwy 21, Warren vicinity
4/7/1994
94000271 (A, C)

WEIPPE

Lolo Trail
Parallel to US 12 on ridges of Bitterroot Mtns., from Lolo Pass to Weippe, Weippe vicinity
10/15/1966
National Historic Landmark, Nez Perce National Historical Park
66000309 (A, B)

WHITE BIRD

Foskett, Dr. Wilson, House and Drugstore
W side of River Rd., White Bird
4/26/2005
05000337 (A, B)

White Bird Battlefield
N of White Bird off U.S. 95, White Bird vicinity
7/18/1974
Nez Perce National Historical Park
74000332 (A)

White Bird Grade
From Grangeville, to White Bird, to the Salmon River, White Bird vicinity
7/30/1974
74000740 (A, C)

JEFFERSON COUNTY

ANNIS

Scott, Josiah, house
SW of Annis, Annis vicinity
11/8/1982
82000387 (C)

RIGBY

Jefferson County Courthouse
134 N. Clark, Rigby
9/27/1987
County Courthouses in Idaho MPS
87001586 (A, C)

RIRIE

Ririe A Pegram Truss Railroad Bridge (main)
1 mi. NNE of jct. Heise Rd/East Belt (Branch rail line), Ririe vicinity
7/25/1997
Pegram Truss Railroad Bridges of Idaho MPS
97000759 (C)

Ririe B Pegram Truss Railroad Bridge (flood)
.5 mi NNE of jct. Heise Rd/East Belt (Branch rail line), Ririe vicinity
7/25/1997
Pegram Truss Railroad Bridges of Idaho MPS
97000760 (C)

ROBERTS

Hotel Patrie
US 91-655 N 2880 E, Roberts
11/7/1978
78001068 (A, C)

JEROME COUNTY

EDEN

Vineyard,Charles C., House
6 mi. SW of Eden, Eden vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002313 (C)

HAZELTON

Havens, Bert and Fay, house
1.0 mi. N of Hazelton, Hazelton vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002346 (C)

Hazelton Presbyterian Church
310 Park Ave., Hazelton
4/26/1991
91000459 (A, C)

Kelley, Marion and Julia, house
450 4th St. E., Hazelton vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002343 (C)

Shepard, L. Fay, House
South of Hazelton, Hazelton vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002300 (C)

HUNT

Minidoka Relocation Center (Minidoka Internment National Monument)
Hunt Rd., Hunt
7/10/1979
79000791 (A)

Wilson Butte Cave
Address Restricted, Hunt vicinity
11/21/1974
74000741 (D)

JEROME

Allton Building
160 E. Main Street, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002299 (C)

Barnes, Tom, Barn
East of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002317 (C)

Bethune-Ayres House
East of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002318 (C)

Blessing, Carl, Outbuildings
NW of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002319 (C)

Bothwell, James, Water Tank House
North of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002320 (C)

Bower, Charles, House
North of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002321 (C)

Brick, Frank J., House
300 N. Fillmore St., Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002322 (C)

Callen, Dick, House
South of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002323 (C)

Canyonside School
South of Jerome, Jerome vicinity
10/14/1983
Lava Rock Structures in South Central Idaho TR
83003579 (A, C)

Cook, William H.S., Water Tank House
SE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83004211 (C)

Cooke, E.V., House
NE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002324 (C)

Daniels, O. J., House
South of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002325 (C)

Doughty, George V., House and Garage
NE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002326 (C)

Epperson, George, House
SE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002354 (C)

Erdman, G. H., House
4.5 mi. W of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002353 (C)

Falls City School House
SE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002352 (C)

Fry, Merritt, Farm
SW of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002351 (C)

Gleason, Edwin C., House
209 E. Ave. A, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002350 (C)

Goff, Hugh and Susie, House
NE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002349 (C)

Graves, Lulu, Farm
NW of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002348 (C)

Gregg, Edward M., Farm
SE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002347 (C)

Heuer Well House and Water
NE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002345 (C)

Jerome City Pump House
NW corner of E. Ave. B and S. Fillmore St., Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002344 (C)

Jerome Cooperative Creamery
313 South Birch Street, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002338 (C)

Jerome County Courthouse
300 N. Lincoln, Jerome
9/28/1987
County Courthouses in Idaho MPS
87001600 (A, C)

Jerome First Baptist Church
302 1st Ave. E. at Buchanan, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002339 (C)

Jerome National Bank
100 E. Main Street, Jerome
1/9/1978
78001069 (C)

Johnson, Edgar, House
SE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002340 (C)

Keating, Clarence, House
NE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002341 (C)

Kehrer, Thomas J., House
North of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002342 (C)

Laughlin, Ben, Water Tank House
SE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002337 (C)

Lawshe, George, Well House
SE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002336 (C)

Lee, J.O., Honey House
322 5th Ave. E, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002334 (C)

Lee, J.O., House
324 5th Ave. E., Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002335 (C)

Mandl, Joseph, House
808 N. Fillmore St., Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002333 (C)

Newman, J.W. and Rachel, House and Bunkhouse
East of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002332 (C)

North Side Canal Company Slaughter House
NE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002331 (C)

Osborne, Jessie, house
4.75 mi. W of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002329 (C)

Quay, Greer and Jennie, House
NE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002330 (C)

Ricketts, Jullian, House
SE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002328 (C)

Schmerschall, John F., House
248 E. Ave. A, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002327 (C)

Shoshone Falls Power Plant Caretaker's House
SE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002301 (C)

Silbaugh, W.H., House
West of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002302 (C)

Spencer, Edward, House and Garage, and the Nelson Barn
NE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002303 (C)

Stevens, Arnold, house
3.5 mi. W of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002304 (C)

Stickel, John, House
SW of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002305 (C)

Sugarloaf School
East of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002306 (C)

Thomason, Rice, Barn
East of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002307 (C)

Tooley, Don, House
NE of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002308 (C)

Van Hook, Jay, Potato Cellar
1.5 mi. S of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002309 (C)

Van Wagener, Jacob B., Barn
5581 US 93, 4.0 mi. E and 3.0 mi. S of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002310 (C)

Van Wagener, Jacob B., Caretaker's House
4.0 mi. E and 3.0 mi. S of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002311 (C)

Veazie, William T. and Clara H., House
SW of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002312 (C)

Vipham, Thomas, House
313 E. Ave. D, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002314 (C)

Webster, Archie, House
Corner of West Avenue B, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002316 (C)

Weigle, William, House and Water Tank
NW of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002315 (C)

KOOTENAI COUNTY

ATHOL

Cedar Mountain School
Parks & Lewellwen Creek rds., Athol vicinity
9/12/1985
Kootenai County Rural Schools TR
85002093 (A, C)

BAYVIEW

Bayview School II
Careywood Rd., 0.5 mi. W. of scenic Bay, Bayview
9/12/1985
Kootenai County Rural Schools TR
85002090 (A, C)

Lake Pend Oreille Lime and Cement Industry Historic District
Roughly, discontiguous sites around Bayview and Lakeview, Bayview vicinity
3/27/1997
94001450 (A, D)

CAMP MIVODEN

East Hayden Lake School II
Hayden Lake Rd., Camp Mivoden vicinity
9/12/1985
Kootenai County Rural Schools TR
85002095 (A, C)

CATALDO

Cataldo Mission
Off U.S. 10, Cataldo
10/15/1966
National Historic Landmark
66000312 (A, C, D)

CLARKSVILLE

Clark House
Hayden Lake, Clarksville
12/12/1978
78001070 (C)

COEUR D'ALENE

Coeur d'Alene City Hall
424 Sherman Ave., Coeur d'Alene
8/3/1979
79000792 (C)

Coeur d'Alene Federal Building
SW corner of 4th and Lakeside Ave. (205 4th), Coeur d'Alene
12/16/1977
77000461 (C)

Coeur d'Alene Masonic Temple
524 Sherman Ave., Coeur d'Alene
5/22/1978
78001071 (C)

Davey, Harvey M., House
315 Wallace Ave., Coeur d'Alene
5/23/1985
85001126 (C)

First United Methodist Church
618 Wallace Ave., Coeur d'Alene
6/18/1979
79000793 (C)

Fort Sherman Buildings
North Idaho College campus, Coeur d'Alene
11/25/1979
79000794 (A)

Gray, John P. and Stella, House
521 S. 13th St., Coeur d'Alene
3/3/1988
88000272 (B, C)

Inland Empire Electric Railway Substation
Mullan Rd. and Northwest Blvd., Coeur d'Alene
6/27/1975
75000633 (A)

Kootenai County Courthouse
501 Government Way, Coeur d'Alene
12/23/1977
77000462 (C)

Mooney-Dahlberg Farmstead
5803 Riverview Dr., Coeur d'Alene vicinity
12/30/2009
09001163 (A)

Mullan Road
3 segments: 1) between Alder Creek and Cedar Creek; 2) Fourth of July Pass between I-80 and Old U.S. 10; 3) Heyburn State Park, Coeur d'Alene vicinity
4/5/1990
90000548 (A)

Prairie School II
S side of Prairie Ave., approx. 0.5 mi. E of Meyer Rd.; 5362 W. Prairie Avenue, Coeur d'Alene vicinity
9/12/1985
Kootenai County Rural Schools TR
85002100 (A, C)

Roosevelt School
NE corner of 1st and Wallace Ave. (107 Wallace Ave.), Coeur d'Alene
7/30/1976
76000676 (C)

Sherman Park Addition Historic District
Bounded by Garden Ave., Hubbard St., Lakeshore Dr. and Park Dr., Coeur d'Alene
4/27/1992
92000418 (C)

St. Thomas Catholic Church
919 Indiana Ave., Coeur d'Alene
10/5/1977
77000463 (C)

HARRISON

Crane, Silas W. and Elizabeth, house
201 S. Coeur d'Alene Ave., Harrison
12/9/1999
99001476 (A)

Harrison Commercial Historic District
Roughly bounded by N. Lake Ave., W. Harrison St., N. Coeur d'Alene Ave., and Pine St., Harrison
12/20/1996
96001505 (A, C)

HAYDEN LAKE

Finch, John, Caretaker's House
1720 Finch Rd., Hayden Lake
9/14/1987
87001562 (A, B, C)

Thunborg, Jacob and Cristina, House
Chicken Point, Hayden Lake vicinity
9/12/1985
85002156 (B, C)

LANE

Lane School II
Lanz Road and ID 3, Lane
9/12/1985
Kootenai County Rural Schools TR
85002097 (A, C)

MCGUIRE

McGuires School
Corbin Rd and Old Highway 10., McGuire
9/12/1985
Kootenai County Rural Schools TR
85002098 (A, C)

MEDIMONT

Cave Lake School
Willow Cr. Rd. and ID 3, Medimont vicinity
9/12/1985
Kootenai County Rural Schools TR
85002092 (A, C)

Indian Springs School II
ID 3, .5 mi N of Rosewood Dr., Medimont
9/12/1985
Kootenai County Rural Schools TR
85002096 (A, C)

PLEASANT VIEW

Pleasant View School II
Pleasant View Rd., approx. 0.3 mi. E of Carpenter Loop Rd., S side, Pleasant View vicinity
9/12/1985
Kootenai County Rural Schools TR
85002099 (A, C)

POST FALLS

Cougar Gulch School III
Cougar Gulch Rd., .5 mi. W of Miller Rd., Post Falls vicinity
9/12/1985
Kootenai County Rural Schools TR
85002094 (A, C)

Post Falls Community United Presbyterian Church
4th and Williams sts., Post Falls vicinity
9/7/1984
84003851 (A, C)

Spokane Valley Land and Water Company Canal
Diverts in Falls Park, 4th St., Post Falls
3/20/2003
03000124 (A)

Treaty Rock
N of I-90, Post Falls vicinity
4/30/1992
92000420 (D)

Washington Water Power Bridges
0.5 mi. W of intersection of Spokane and 4th Sts., Post Falls
12/20/1996
96001507 (C)

Young, Samuel and Ann, House
120 4th Street, Post Falls
7/9/1997
97000765 (A, C)

RATHDRUM

Kootenai County Jail
802 2nd St., Rathdrum
8/10/2001
01000834 (A)

Rathdrum State Bank
1st and Mills streets, Rathdrum
11/8/1974
74000742 (C)

Saint Stanislaus Kostka Mission
8026 (808) W. 2nd St. (old address: 808 Second St.), Rathdrum
11/17/1977
77000464 (C)

ROCKFORD BAY

Bellgrove School II
Hamaker Rd., .25 mi. N of Rockford Bay, Rockford Bay vicinity
9/12/1985
Kootenai County Rural Schools TR
85002091 (A, C)

ROSE LAKE

Rose Lake School II
Queen St. and ID 3, Rose Lake
9/12/1985
Kootenai County Rural Schools TR
85002101 (A, C)

SILVER SANDS BEACH

Upper Twin Lakes School
Twin Lakes Rd., Silver Sands Beach vicinity
9/12/1985
Kootenai County Rural Schools TR
85002102 (A, C)

SPIRIT LAKE

Spirit Lake Historic District
Maine St., Spirit Lake
2/1/1979
79000795 (A, C)

LATAH COUNTY

BOVILL

Bovill Opera House
412 2nd Ave., SE corner of 2nd and Pine, Bovill
1/27/2010
Motion Picture Theater Buildings in Idaho MPS
09001280 (A)

Hotel Bovill
602 Park Avenue, Bovill
6/23/1994
94000629 (A)

St. Joseph's Catholic Church
301 1st Avenue, Bovill
11/17/1982
Tourtellotte and Hummel Architecture TR
82000351 (C)

DEARY

Lawrence, Russell, Farmstead
5471 SH 8, Deary vicinity
11/30/2011
Agricultural Properties of Latah County, Idaho MPS
11000862 (A)

GENESEE

Genesee Exchange Bank
Walnut St., Genesee
1/8/1979
79000796 (A, C)

Nordby Farmstead
1301 Old Highway 95, Genesee
5/15/2009
Agricultural Properties of Latah County, Idaho MPS
09000293 (A)

Vollmer Building
Walnut St., Genesee
1/8/1979
79000797 (A, C)

White Spring Ranch
1004 Lorang Rd., Genesee vicinity
1/6/2004
03001368 (A)

JULIAETTA

Abram A. Adams Home/ The Castle Museum
191 State Street, Juliaetta
4/24/2017
100000908 (C)

Bank of Juliaetta
301 Main St., Juliaetta
1/15/1998
97001649 (A, C)

KENDRICK

Bethany Memorial Chapel
Kendrick-Deary Hwy., Kendrick
12/6/1979
79000798 (C)

Cox Barn
1290 American Ridge Rd., N of Juliaetta, Kendrick vicinity
2/1/2010
Agricultural Properties of Latah County, Idaho MPS
09001281 (A)

Kendrick Downtown Historic District
Generally bounded by 3rd, & S Kirby Sts., original NPRR alignment & grade rising N of E Main St., Kendrick
1/2/2018
100001920 (A)

Kendrick Fraternal Temple
614 East Main, Kendrick
3/27/2013
13000108 (A)

Kirby, Thomas, House
102 N. 9th St., Kendrick
4/1/1999
99000414 (B, C)

MOSCOW

Administration Building, University of Idaho
851 Campus Dr., Moscow
2/14/1978
78001072 (A, C)

Cordelia Lutheran Church
.25 mi. S of jct. of Genesee-Troy and Danielson Rds., Moscow vicinity
8/31/1995
95001058 (A)

Cornwall, Mason, House
308 S. Hayes St., Moscow
12/2/1977
77000465 (B, C)

David's Building
302-310 S. Main, Moscow
12/11/1979
79000799 (A, C)

Deesten Farmstead
3611 US 95 S., W side, S of Moscow, Moscow
4/2/2008
Agricultural Properties of Latah County, Idaho MPS
08000250 (A)

First Methodist Church
322 E. 3rd St., Moscow
10/5/1978
78001073 (C)

Fort Russell Neighborhood Historic District
Roughly bounded by Jefferson, Monroe, 2nd and D Sts., Moscow
11/26/1980
80001329 (A, C)

Fort Russell Neighborhood Historic District Expansion
Roughly bounded by Jefferson St, East D St, Hayes St, and East 3rd St, Moscow
9/25/2017
100001654 (C)

Hotel Moscow
309-313 S. Main, Moscow
11/30/1978
78001074 (A, C)

Kappa Sigma Fraternity, Gamma Theta Chapter
918 Blake Street, Moscow
9/3/1996
96000945 (A, C)

Kenworthy Theatre
508 S. Main St., Moscow
11/29/2001
Motion Picture Theater Buildings in Idaho MPS
01001305 (A)

Lieuallen, Almon Asbury, residence
101 S. Almon St., Moscow
3/3/1978
78001075 (B, C)

McConnell, W.J., House
110 S. Adams St., Moscow
11/21/1974
74000743 (B, C)

McConnell-McGuire Building
102 S. Main, Moscow
2/7/1978
78001076 (A, C)

Memorial Gymnasium, University of Idaho
1001 University Avenue, Moscow
10/5/1977
77000466 (A, C)

Moscow Carnegie Library
110 S. Jefferson, Moscow
6/18/1979
79000800 (C)

Moscow Downtown Historic District
Generally bounded by 1st St., 6th St., Washington St., and the alley between Main and Jackson, Moscow
7/22/2005
05000710 (A)

Moscow High School
410 3rd E., Moscow
5/5/1992
Public School Buildings in Idaho MPS
92000416 (A)

Moscow Post Office and Courthouse
206 E. 3rd St., Moscow
7/3/1973
73000686 (C)

Nu Art Theatre
516 S. Main St., Moscow
11/29/2001
Motion Picture Theater Buildings in Idaho MPS
01001304 (A)

Ridenbaugh Hall (Music Annex)
University of Idaho, Campus Dr., Moscow
9/14/1977
77000467 (C)

Sigma Alpha Epsilon Fraternity House
920 Deakin Ave., Moscow
12/2/1993
93001335 (C)

Skattaboe Block
403 S. Main, Moscow
5/22/1978
78001077 (A, C)

Snow, Arthur, House
2949 Clyde Rd., Moscow
5/5/2009
09000294 (C)

University of Idaho Gymnasium & Armory
951 Campus Dr., SW Corner of University Ave & Line St., Moscow
1/3/1983
Tourtellotte and Hummel Architecture TR
83000287 (C)

POTLATCH

American Legion Cabin
S. side Hwy 95A, opposite cemetery and adjacent to city park, Potlatch
9/11/1986
Potlatch MRA
86002197 (C)

Boarding House
850 Pine St., Potlatch
9/11/1986
Potlatch MRA
86002199 (A, C)

Commercial Historic District
Roughly Pine St. between 7th and 5th Sts., Potlatch
9/11/1986
Potlatch MRA
86002201 (A, C)

Four-Room House
1015 Pine St., Potlatch
9/11/1986
Potlatch MRA
86002204 (C)

Freeze Community Church
1 mi. W of US 95, Potlatch
5/3/1990
90000679 (A, C)

Nob Hill Historic District
Roughly bounded by 4th, Spruce, 3rd, and Cedar Sts., Potlatch
9/11/1986
Potlatch MRA
86002206 (A, B, C)

Soncarty, Edward and Ida, Barn
1671 Deep Creek Rd., Potlatch
4/2/2008
Agricultural Properties of Latah County, Idaho MPS
08000251 (A, C)

Terteling, Joseph D., House
1015 Fir St., Potlatch
9/11/1986
Potlatch MRA
86002208 (B, C)

Three-Room House
940 Cedar, Potlatch
9/11/1986
Potlatch MRA
86002210 (C)

Worker's Neighborhood Historic District
Roughly Spruce St. between 8th and 5th Sts., Potlatch
9/11/1986
Potlatch MRA
86002211 (A, C)

TROY

Bohman, Axel, House
116 N. Main St., Troy
8/10/2011
11000523 (C)

Bohman, Ole, House
114 N. Main St., Troy
5/22/2013
13000293 (B, C)

Hotel Rietmann
525 and 529 S. Main St., Troy
11/29/2001
01001302 (A)

Troy Downtown Historic District
339 S. Main St. through 527 S. Main St., Troy
3/11/2010
10000073 (A)

Troy Hospital
604 S. Main St., Troy
8/10/2011
11000524 (A)

LEMHI COUNTY

COBALT

Shoup Rockshelters
Address Restricted, Cobalt vicinity
11/8/1974
74000744 (D)

LEADORE

Birch Creek Charcoal Kilns
6.0 mi. W of S.H. 28, approx. halfway btw. Salmon & Idaho Falls, Leadore vicinity
2/23/1972
72001577 (A)

LEMHI

Lemhi Boarding School Girls' Dormitory
Hayden Creek Rd., 1/8 mi SE of jct w/US 93, Lemhi vicinity
11/12/1998
98001350 (A)

SALMON

Episcopal Church of the Redeemer
1st St. N. (Courthouse Dr.) at Fulton Street, Salmon
1/12/1979
79000801 (C)

Fort Lemhi
Address Restricted, Salmon vicinity
2/23/1972
72000443 (A, D)

Geertson, Lars, House
SE of Salmon, Salmon vicinity
4/3/1980
80001330 (C)

Leesburg Townsite
W of Salmon at Napias Cr. on the Salmon National Forest, Salmon vicinity
4/4/1975
75000634 (A)

Lemhi County Courthouse
S side of 1st St. N. (Courthouse Dr.), S of Lombard St., Salmon
2/7/1978
78001078 (A, C)

Myers, Socrates A., Residence
300 Hall St., Salmon
12/2/1977
77000468 (A, C)

Odd Fellows Hall
516 Main St., Salmon
2/7/1978
78001079 (A, C)

Salmon City Hall and Library
200 Main St., Salmon
11/17/1982
Tourtellotte and Hummel Architecture TR
82000352 (C)

Salmon Odd Fellows Hall
510-514 Main St., Salmon
8/25/1978
78001080 (C)

Shoup Building
SW corner of Center St. and Main St., Salmon
3/31/1978
78001081 (B, C)

TENDOY

First Flag Unfurling Site, Lewis & Clark Trail
5 mi. N of Tendoy in Bitterroot Mtns., Tendoy vicinity
8/22/1975
75000635 (A)

Lemhi Pass
12 mi. E of Tendoy of ID 28, Tendoy vicinity
10/15/1966
National Historic Landmark
66000313 (A)

LEWIS COUNTY

CULDESAC

St. Joseph's Mission
S of Culdesac off US 95, Culdesac vicinity
10/15/1966
Nez Perce National Historical Park
76000677 (A, B)

KAMIAH

Bridwell, James F., House
107 5th St., Kamiah
4/6/1989
88001446 (B)

State Bank of Kamiah
ID 64, Kamiah
8/29/1978
78001082 (C)

LINCOLN COUNTY

DIETRICH

Bate, S.A., Barn & Chicken House
2 mi SE of Dietrich, Dietrich vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002358 (C)

Berriochoa, Ingacio, Farm
5 mi NW of Dietrich, Dietrich vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002360 (C)

Hunt, Daniel A., House
4 mi SW of Dietrich, Dietrich vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002371 (C)

Paul, Denton J., Water Tank
1 mi E of Dietrich, Dietrich vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002384 (C)

RICHFIELD

Boussuet, Birdie, Farm
1.75 mi. W of Richfield, Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002361 (C)

Eskelton, Alvin, Barn
1 mi W and 3.5 mi N of Richfield, Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002367 (C)

Johnson, Louis, Barn
SW of Richfield, Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002373 (C)

Johnson, Louis, Water Tank House
5 mi W of Richfield, Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002374 (C)

Johnson, Quet, Farm
3 mi N and 7/8 mi W of Richfield, Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002375 (C)

Kohl, W.S., Barn
1 mi E and 1 mi N of Richfield, Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002376 (C)

Lane, James H., Barn
1 mi S of Richfield, Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002377 (C)

Lemmon Hardware Store
Main St. & Nez Perce Ave., Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002378 (C)

Phelps, Kenneth G., Barn
1 mi W of Richfield, Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002385 (C)

Richfield Pump House
1 mi SE of Richfield, Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002386 (C)

Turner, John G. House
Hwy 26/93, approx. 5.0 mi. SW of Richfield, W of Hwy, Richfield vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002392 (C)

SHOSHONE

American Legion Hall
107 W. A St., Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002355 (C)

Anasola, Jose and Gertrude, House
120 N. Alta St., Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002356 (C)

Arambarri, Galo, Boarding House
109 N. Greenwood St, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002357 (C)

Baugh, W.H., house
5.5 mi E of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002359 (C)

Byrnes, Tom, House
15 mi. NE of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002362 (C)

Custer Slaughter House
1 mi W of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002363 (C)

Darrah House & Water Tank House
5 mi NE of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002365 (C)

Darrah, Ben, Water Tank and Well House
6 mi N and 1.25 mi W of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002364 (C)

Dill, Charles W., House
Approx. 2.5 mi. E of Shoshone, N of Hwy 24, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002366 (C)

Gaches, George H., Cellar & Ice House
6 mi N and 2 mi W of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002368 (C)

Gooding, Thomas, Water Tank House
745 N. 550 W., Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002369 (C)

Gottfried, Gehrig, Cabin
11 mi NE of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002370 (C)

J.C. Penney Company Building
104 S. Rail St. E, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002372 (C)

Murphy, W.H., House
607 S. Greenwood St, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002379 (C)

Myers School
8 mi W of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002380 (C)

Newman, A.G., House
309 E. C St., Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002381 (C)

Olley, Thomas, House
522 N. Apple St., Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002382 (C)

Oughton, Jack, House
123 N. Beverly St., Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002383 (C)

Purdum Livery Stable
113 N. Rail St. E, Shoshone
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002393 (A, C)

Ritter, William R., House
5 mi N, 2 mi E, 0.75 mi N of Shoshone, R side of rd., Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002387 (C)

Shoshone Historic District
Irregular pattern, includes N bank of Littlewood River and W. D St., Shoshone
6/27/1975
75000636 (A, B, C)

Shoshone Historic District (Boundary Increase)
115 N. Greenwood St., Shoshone
9/18/1998
98001173 (A)

Silva, Arthur D., Flume
4 mi N, 3 mi E of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002388 (C)

Silva, Arthur D., Ranch
4 mi N, 3 mi E of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002389 (C)

Silva, Arthur D., Water Tank
4 mi N, 3 mi E of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002390 (C)

Silva, Manuel, Barn
approx. 2.0 mi. E of Shoshone, Shoshone vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002391 (C)

Wood River Center Grange No. 87
375 W. 4 Mile Rd., Shoshone vicinity
7/3/2003
03000586 (A)

MADISON COUNTY

REXBURG

Madison County Courthouse
E. Main St., Rexburg
9/22/1987
County Courthouses in Idaho MPS
87001587 (A, C)

Rexburg Stake Tabernacle
25 N. Center St., Rexburg
5/3/1974
74000745 (C)

Spori, Jacob, Building
100 E. 2nd S. St., Rexburg
4/20/1989
89000329 (A)

MINIDOKA COUNTY

MINIDOKA

Minidoka Dam and Power Plant
On Snake River, W side of Lake Walcott, 11 mi. NE of Rupert and 6 mi. S of Minidoka, Minidoka vicinity
10/29/1974
74000746 (A, C)

RUPERT

Empire School
300 S. 50 E, Rupert vicinity
5/30/2001
Public School Buildings in Idaho MPS
01000568 (A)

Rupert Town Square Historic District
Roughly bounded by 7th St., E St., 5th St., and F St., Rupert
1/17/2001
00001626 (A)

Rupert Town Square Historic District (Boundary Increase)
702 E St. and 405 6th St., Rupert
3/17/2010
10000074 (A)

NEZ PERCE COUNTY

LAPWAI

First Lapwai Bank
302. W 1st St., Lapwai
3/12/1980
80001331 (A, C)

First Presbyterian Church
NE corner of Locust Ave. and E. 1st St., Lapwai
3/12/1980
80001332 (C)

LENORE

Lenore Site
Address Restricted, Lenore
11/21/1974
Nez Perce National Historical Park
74000284 (D)

LEWISTON

Aspoas, James, House
1610 15th Ave., Lewiston
11/25/1994
94001366 (A, C)

Booth, Frank, house
1608 17th Ave., Lewiston
11/25/1994
94001367 (A)

Breier Building
631-633 Main St., Lewiston
6/13/1986
86001261 (C)

Children's Home Finding and Aid Society of North Idaho
1805 19th Ave., Lewiston
2/23/2007
07000090 (A, C)

First Christian Church
NE corner of 7th Ave. and 7th St., Lewiston
8/31/1978
78001083 (C)

Garfield School
2912 5th Ave., Lewiston
4/15/1982
82002513 (C)

Hasotino
Address Restricted, Lewiston vicinity
4/2/1976
Nez Perce National Historical Park
76000678 (D)

Hatwai Village Site
Address Restricted, Lewiston vicinity
10/5/1982
82000353 (A, D)

Hester, Patrick J. and Lydia, House
1622 15rh Ave., Lewiston
11/25/1994
94001365 (A)

Idaho Grocery Warehouse and Annex
1209 Main St., Lewiston
11/17/1982
Tourtellotte and Hummel Architecture TR
82000354 (C)

JEAN (steamboat)
3620 A Snake River Ave. in Hells Gate State Park, Lewiston
8/8/1989
89001001 (A, C)

Kettenbach, Henry C., Residence
1026 9th Ave., Lewiston
2/7/1978
78001084 (B, C)

Lewiston City Hall
207 3rd St., Lewiston
11/17/1982
Tourtellotte and Hummel Architecture TR
82000355 (C)

Lewiston Depot
13th and Main sts., Lewiston
5/7/1973
73000687 (A, C)

Lewiston Historic District
Irregular pattern between 1st and 5th Sts. And B St. and the Snake River, Lewiston
6/5/1975
75000637 (A, C)

Lewiston Historic District (Boundary Increase)
Roughly bounded by 1st, B, 6th, and F Sts., Lewiston
9/7/1984
84003852 (A, C)

Lewiston Methodist Church
805 6th Ave., Lewiston
9/20/1979
79000802 (C)

Lewiston Vineyards Gates
18th Ave. and 10th St., Lewiston
4/14/1983
Tourtellotte and Hummel Architecture TR
83000288 (C)

McLaren, William and Elizabeth, House
1602 15th Ave., Lewiston
11/6/1992
92001413 (A, C)

Nave Apartments
610 8th St., Lewiston
8/3/1978
78001085 (C)

Nez Perce Snake River Archaeological District
Address Restricted, Lewiston vicinity
12/22/1978
78001086 (D)

St. Stanislaus Catholic Church
633 5th Ave., Lewiston
2/7/1978
78001087 (C)

Tamblyn, Agnes M., House
1506 17th Ave., Lewiston
11/25/1994
94001364 (A, C)

Thompson, Gaylord, House
1824 17th Ave., Lewiston
5/4/1992
92000419 (A, C)

Twenty-One Ranchhouse
39700 Waha Rd., Lewiston vicinity
12/18/1978
78001088 (C)

Wyatt, Louisa E. and W.R., House
1524 18th Ave., Lewiston
11/25/1994
94001362 (A)

PECK

American Woman's League Chapter House
217 Main St., Peck
6/4/1986
86002158 (A, C)

SPALDING

Nez Perce National Historical Park
Area 90 mi. S and 150 mi. E of Spalding, Spalding vicinity
10/15/1966
66000310 (A, B, C)

ONEIDA COUNTY

MALAD CITY

Co-op Block and J.N. Ireland Bank
Main and Bannock Sts., Malad City
4/18/1979
79000804 (A)

Evans, D.L. Sr., Bungalow
203 N. Main St., Malad City
8/30/1979
79000805 (B, C)

Jones, Jedd, House
242 N. Main St., Malad City
5/1/1979
79000806 (A, C)

Malad Second Ward Tabernacle
20 S 100 W St., Malad City
7/27/1979
79000803 (C)

Oneida County Courthouse
Court St., Malad City
11/27/1987
County Courthouses in Idaho MPS
87001588 (A, C)

United Presbyterian Church
7 S. Main St., Malad City
10/16/1979
79000807 (A, C)

SAMARIA

Samaria Historic District
Roughly bounded by Main and 3rd Sts., 1st Ave. N. and S end of 2nd St., Samaria
6/11/1979
79003740 (A, C)

OWYHEE COUNTY

BRUNEAU

Bruneau Episcopal Church
near Hwy 51, Bruneau
11/17/1982
Tourtellotte and Hummel Architecture TR
82000356 (C)

GRAND VIEW

Guffey Butte - Black Butte Archaeological District
Address Restricted, Grand View vicinity
10/10/1978
78001038 (D)

HOMEDALE

Poison Creek Stage Station
S of Homedale off Jump Creek Rd., Homedale vicinity
5/22/1978
78001089 (A, C)

JORDAN VALLEY

Gusman, James E. and Emma, Ranch
South Mountain Rd., 6 mi. SE of Jordan Valley, Oregon, Jordan Valley vicinity
12/9/1999
99001477 (A)

MURPHY

Bernard's Ferry
N of Murphy off ID 78, Murphy vicinity
5/22/1978
78001090 (A, C)

Noble Horse Barn
W of Reynolds Cr., 12 mi. E of Murphy, Murphy vicinity
8/8/1991
91000989 (A)

Owyhee Country Courthouse
near Hwy 45, Murphy
11/17/1982
Tourtellotte and Hummel Architecture TR
82000357 (C)

Swan Falls Dam and Power Plant
E of Murphy at Snake River, Murphy vicinity
7/6/1976
76000667 (A, C)

OREANA

Our Lady, Queen of Heaven Church
1 mi S of Oreana, Oreana vicinity
11/28/1980
80001333 (C)

REYNOLDS

Camp Lyon Site
1 mi E of US 95, Oregon boundary, on Cow Creek, Reynolds vicinity
12/27/1972
72000444 (A)

SILVER CITY

Camp Three Forks
S of Silver City, Silver City vicinity
12/15/1972
72000445 (A)

Delamar Historic District
6 mi W of Silver City, Silver City vicinity
5/13/1976
76000679 (A, C)

Silver City Historic District
Silver City and its environs, Silver City
5/19/1972
72000446 (A)

WAGON BOX BASIN

Camas and Pole Creeks Archaeological District
Address Restricted, Wagon Box Basin vicinity
5/5/1986
86001203 (D)

WICKAHONEY

Wickahoney Post Office and Stage Station
Wickahoney Cr., Wickahoney
5/27/1982
82002514 (A, C)

PAYETTE COUNTY

NEW PLYMOUTH

New Plymouth Congregational Church
207 Southwest Ave., New Plymouth
11/17/1982
Tourtellotte and Hummel Architecture TR
82000359 (C)

PAYETTE

Chase, David C., House
307 9th St. N., Payette
2/7/1978
78001091 (C)

Coughanour Apartment Block
700-718 1st Ave. N., Payette
5/23/1978
78001092 (C)

Jacobsen, N.A., Building
40 N. 8th, Payette
11/17/1982
Tourtellotte and Hummel Architecture TR
82000358 (C)

Jacobsen, N.A., House
1115 1st Ave. N., Payette
1/7/1998
97001610 (A, C)

Moss, A.B., Building
137 N. Main St., Payette
2/8/1978
78001093 (C)

Palumbo, J.C., Fruit Company Packing Warehouse Building
NE Corner 2nd Ave and 6th St., Payette
11/17/1982
Tourtellotte and Hummel Architecture TR
82000360 (C)

Payette City Hall and Courthouse
240 N. 8th, Payette
5/14/1979
79000808 (C)

Portia Club
225 N. 9th, Payette
4/7/2010
10000159 (A)

St. James Episcopal Church
1st Ave. N & 10th N St., Payette
4/20/1978
78001094 (C)

St. John's Church
350 N. 4th St., Payette
6/5/2013
13000353 (A)

U.S. Post Office - Payette Main
915 Center Ave., Payette
3/16/1989
US Post Offices in Idaho 1900-1941 MPS
89000134 (A, C)

Whitney, Grant, House
1015 7th Ave. N., Payette
2/23/1978
78001095 (C)

Woodward Building
23 S. 8th St., Payette
4/26/1978
78001096 (C)

POWER COUNTY

AMERICAN FALLS

American Falls Archaeological District
Address Restricted, American Falls vicinity
7/1/1999
99000804 (D)

American Falls East Shore Power Plants
ID 39, American Falls
10/29/1976
76000680 (C)

American Falls Reservoir Flooded Townsite
American Falls Reservoir, American Falls
1/28/2002
01001480 (A)

Bethany Deaconess Hospital
500 Pocatello Hwy Ave., American Falls
4/27/1995
95000507 (A)

Davie, William, House
703 Hutchinson Ave., American Falls
4/2/2008
American Falls, Idaho, Relocated Townsite MPS
08000252 (A)

Oneida Milliing & Elevator Company Grain Elevator
Offshore in American Falls Reservoir, American Falls vicinity
7/16/1993
93000380 (A)

Oregon Trail Historic District
SW of American Falls along US 30 N, American Falls vicinity
3/20/1973
73000688 (A)

Oregon Trail Historic District (Boundary Increase)
W of American Falls, American Falls vicinity
6/7/1974
74002296 (A)

Power County Courthouse
Bannock Ave., American Falls
9/22/1987
County Courthouses in Idaho MPS
87001601 (A, C)

Register Rock
W of American Falls on U.S. 30, American Falls vicinity
7/24/1978
78001097 (A)

Sparks, Walter, House
408 Roosevelt St., American Falls
2/7/2007
American Falls, Idaho, Relocated Townsite MPS
07000002 (A)

St. John's Episcopal Church
328 Roosevelt St., American Falls
2/7/2007
American Falls, Idaho, Relocated Townsite MPS
07000004 (A)

Warwas, Richard and Winnie, House
275 Polk St., American Falls
8/31/2006
American Falls, Idaho, Relocated Townsite MPS
06000741 (A)

SHOSHONE COUNTY

AVERY

Avery Depot
Chicago, Milwaukee, St. Paul, and Pacific RR track, Avery
9/20/1984
North Idaho 1910 Fire Sites TR
84001142 (A)

Avery Ranger District
Near St. Joseph National Forest, Avery
6/27/1974
74000748 (A, C)

Bullion Tunnel
E of Avery, Avery vicinity
9/20/1984
North Idaho 1910 Fire Sites TR
84001160 (A, C)

Cedar Snags
N of Avery, Avery vicinity
9/20/1984
North Idaho 1910 Fire Sites TR
84001174 (A)

Chicago, Milwaukee, St. Paul and Pacific Railroad Company Historic District
Idaho Panhandle National Forest, encompassing 56 mi. between St. Regis, MT and Avery ID, Avery vicinity
10/26/2000
00001269 (A, C, D)

Grand Forks
E of Avery, Avery vicinity
9/20/1984
North Idaho 1910 Fire Sites TR
84001175 (A)

Mallard Peak Lookout
SE of Avery on Forest Trail #1, Avery vicinity
4/16/1984
84001178 (A, C)

Red Ives Ranger Station
SE of Avery on Forest Service Rd. 218, Avery vicinity
9/13/1986
86002151 (A, C)

KELLOGG

U.S. Post Office - Kellogg Main
302 S. Division St., Kellogg
5/30/1990
US Post Offices in Idaho 1900-1941 MPS
89002118 (A, C)

MULLAN

St. Andrew's Episcopal Church
104 Hunter Ave., Mullan
4/1/1999
99000419 (A)

MURRAY

Feehan, John C., House
Main St., Murray
8/27/1980
80001334 (C)

Murray Courthouse
Main St., Murray
11/14/1978
78001098 (C)

Murray Masonic Hall
Main St. between 2nd & 3rd, Murray
5/19/1987
87000774 (A, C)

PINEHURST

Pine Creek Baptist Church
NW corner of Main & S. 3rd, Pinehurst
3/1/1983
Tourtellotte and Hummel Architecture TR
82000361 (C)

PRITCHARD

Magee Ranger Station Historic District
W. of Pritchard, Pritchard vicinity
2/18/1981
81000208 (A, C)

RED IVES

Halm Creek, Bean Creek Fire
S of Red Ives, Red Ives vicinity
9/20/1984
North Idaho 1910 Fire Sites TR
84001177 (A)

WALLACE

Northern Pacific Railway Depot
219 6th St., Wallace
4/2/1976
76000681 (A, C)

Pulaski, Edward, Tunnel & Placer Creek Escape Route
West Fork Placer Creek, Wallace vicinity
9/20/1984
North Idaho 1910 Fire Sites TR
84001179 (A)

U.S. Post Office - Wallace Main
403 Cedar St., Wallace
3/16/1989
US Post Offices in Idaho 1900-1941 MPS
89000137 (A, C)

Wallace 1910 Fire Memorial
Nine Mile Cemetery, N of Wallace, Wallace vicinity
9/20/1984
North Idaho 1910 Fire Sites TR
84001180 (A)

Wallace Carnegie Library
City Park, Wallace
2/3/1981
81000209 (C)

Wallace Historic District
Roughly bounded by Pine, Bank, 5th and 7th Sts., Wallace
8/10/1979
79000809 (C)

Wallace Historic District (Boundary Increase)
Roughly bounded by Oak, Silver, C, Mullan, Canyon, Fir, and 1st Sts., Wallace
9/1/1983
83000289 (A, C)

TETON COUNTY

DRIGGS

Pierre's Hole 1832 Battle Area Site
S of Driggs, Teton Valley, Driggs vicinity
9/7/1984
84001197 (A)

Spud Drive-In Theater
231 S. ID 33, Driggs vicinity
6/5/2003
99001475 (A)

Teton County Courthouse
Main St. & Wallace Ave., Driggs
9/22/1987
County Courthouses in Idaho MPS
87001589 (A, C)

TETONIA

Hollingshead Homestead
107 W. 1200 N. Teton County Rd., Tetonia vicinity
2/9/2006
06000002 (A, C)

VICTOR

Victor Railroad Depot
70 Depot St., Victor
4/27/1995
95000508 (A)

TWIN FALLS COUNTY

BUHL

Bowlby, T.P., Barn
NE of Buhl, Buhl vicinity
9/7/1983
Buhl Dairy Barns TR
83000293 (A, C)

Buhl City Hall
203 Broadway N. at corner of Locust, Buhl
2/8/1978
78001099 (C)

Buhl IOOF Building
1014 Main St., Buhl
12/27/1984
84000482 (A, C)

Cedar Draw School
E 4300 N between 1900 and 2000 E, Buhl vicinity
8/8/1991
Public School Buildings in Idaho MPS
91000986 (A)

Dau-Weubbenhorst Barn
1600 E. and Cemetery Rd., Buhl vicinity
9/7/1983
Buhl Dairy Barns TR
83000295 (A, C)

Hotel Buhl
1004 Main St., Buhl
9/12/1985
85002158 (C)

Kunze, Rudolph, Barn
NE of Buhl, Buhl vicinity
9/7/1983
83000292 (A, C)

Maxwell, Art and Frieda, Barn
SE of Buhl, Buhl vicinity
9/7/1983
Buhl Dairy Barns TR
83000291 (A, C)

Ramona Theater
113 Broadway Ave. S., Buhl
12/22/1976
76000682 (C)

Schick, Henry, Barn
Cemetery Rd. and 1700 E., Buhl vicinity
9/7/1983
Buhl Dairy Barns TR
83000290 (A, C)

U.S. Post Office - Buhl Main
830 Main St., Buhl
3/16/1989
US Post Offices in Idaho 1900-1941 MPS
89000130 (A, C)

CASTLEFORD

Toana Freight Wagon Road Historic District
Generally runs south to north from Nevada-Idaho state line to the Snake River, Castleford vicinity
11/29/2006
06001075 (A)

FILER

Duquesne, Achille, House
710 W. Midway, Filer
9/23/1993
93000990 (C)

Union School
21337 US Hwy 30, 3.5 mi. W of Twin Falls, Filer
3/20/2003
Public School Buildings in Idaho MPS
03000123 (A)

HOLLISTER

Hollister School
2464 Salmon Ave., Hollister
8/8/1991
Public School Buildings in Idaho MPS
91000984 (A)

KIMBERLY

Kimberly High School
141 Center St. W, Kimberly
8/17/1990
90001229 (A)

Pleasant Valley School
6501 E. 3100 N, Kimberly vicinity
8/8/1991
Public School Buildings in Idaho MPS
91000985 (A)

MURTAUGH

Caldron Linn
2 mi. E of Murtaugh, Murtaugh vicinity
6/27/1972
72000442 (A)

Milner Dam and the Twin Falls Main Canal
Twin Falls Main Canal between Murtaugh and Milner Lakes, Murtaugh
7/10/1986
84001720 (A)

ROGERSON

Salmon Falls Dam
Approx. 8.0 mi. E of Rogerson on Three Creek Hwy., Rogerson vicinity
5/15/2009
09000328 (A, B, C)

TWIN FALLS

Alvis, James, House
1311 Poleline Rd., Rte. 4, Twin Falls
5/23/1980
80001335 (C)

Bickel School
607 2nd Ave. E., Twin Falls
8/17/1990
90001233 (A, C)

Idaho Power Substation
Van Buren St. and Filer Ave., Twin Falls
6/23/1978
78001100 (C)

Lincoln School
238 7th St. N., Twin Falls
8/17/1990
90001218 (A, C)

Lincoln Street Electric Streetlights
105, 120, 147, 174, 189, 210, 217, 242, 275 and 290 Lincoln St., Twin Falls
4/27/1992
92000413 (A)

McCollum, Robert, House
708 Shoshone St. E., Twin Falls
11/4/1982
82000386 (C)

Morse, Burton, House
136 10th Ave. N., Twin Falls
9/23/1993
93000992 (C)

Peck, D.H., House
207 8th Ave. E., Twin Falls
9/23/1993
93000993 (C)

Pleasant View School
2475 E 3600 N, Twin Falls vicinity
8/8/1991
Public School Buildings in Idaho MPS
91000987 (A)

Priebe, Walter, House
155 7th Ave. East, Twin Falls
9/23/1993
93000991 (C)

Smith, C. Harvey, House
255 4th Ave. E., Twin Falls
4/3/1978
78001101 (C)

Stricker Store and Farm
3200 N Rd. and 3700 E Rd.; 3715 Stricker Cabin Rd., Twin Falls
8/30/1979
79000810 (A, C)

Twin Falls Bank and Trust Company Building
102 Main Ave. S., Twin Falls
9/4/1986
86002155 (A, C)

Twin Falls Canal Company Building
162 2nd St. W., Twin Falls
8/30/1996
96000944 (A)

Twin Falls City Park Historic District
2nd N., 2nd E., and Shoshone Sts., 4th and 6th Aves., Twin Falls
3/30/1978
78001102 (A, C)

Twin Falls Downtown Historic District
Roughly bounded by 2nd Ave. N., 2nd St. E., 2nd St. W., 2nd St. S., 3rd Ave. S., and 3rd St. W., Twin Falls
2/4/2000
00000035 (A, C)

Twin Falls Milling and Elevator Company Warehouse
516 2nd St. S., Twin Falls
8/31/1995
95001059 (A)

Twin Falls Original Townsite Residential Historic District
Roughly bounded by Blue Lakes Ave., Addison Ave., 2nd Ave. E., 2nd Ave. W., Twin Falls
11/30/2001
01001306 (A, C)

Twin Falls Warehouse Historic District
Roughly bounded by 2nd Ave. S., 4th St. S., Minidoka Ave., and 4th St. W., Twin Falls
1/15/1997
96001592 (A, C)

VALLEY COUNTY

BLACK BUTTE

Cabin Creek Ranch
Cabin Cr. at jct. with Big Cr., Payette NF, Black Butte vicinity
6/27/1990
90000890 (A, D)

DONNELLY

Korvola, John, Homestead
Roseberry Rd. and Farm to Market Rd., Donnelly vicinity
11/17/1982
Long Valley Finnish Structures TR
82000366 (C)

Mahala, Jacob and Herman, Homestead
N of Donnelly, Donnelly vicinity
11/17/1982
Long Valley Finnish Structures TR
82000369 (C)

Maki, Jacob, Homestead
Off ID 55, Donnelly vicinity
11/17/1982
Long Valley Finnish Structures TR
82001053 (C)

LAKE FORK

Jarvi, Thomas, Homestead
E of Lake Fork on Finn Rd., Lake Fork vicinity
11/17/1982
Long Valley Finnish Structures TR
82000363 (C)

Johnson (Rintakangas), John G., Homestead
NE of Lake Fork off Pearson Rd., Lake Fork vicinity
11/17/1982
Long Valley Finnish Structures TR
82000364 (C)

Johnson (Sampila), John S., Homestead
NE of Lake Fork off Pearson Rd., Lake Fork vicinity
11/17/1982
Long Valley Finnish Structures TR
82000365 (C)

Laituri, Gust, Homestead
NE of Lake Fork off Pearson Rd., Lake Fork vicinity
11/17/1982
Long Valley Finnish Structures TR
82000368 (C)

Long Valley Finnish Church
SE of Lake Fork on Farm to Market Rd., Lake Fork vicinity
5/27/1980
80001336 (A, C)

Ojala, Herman, Homestead
NE of Lake Fork off Pearson Rd., Lake Fork vicinity
11/17/1982
Long Valley Finnish Structures TR
82000370 (C)

Ruatsala, Matt, Homestead
N of Kantola Lane, Lake Fork vicinity
11/17/1982
Long Valley Finnish Structures TR
82000371 (C)

MCCALL

Elo School
SE of ID 55 on Farm to Market Rd., McCall vicinity
7/26/1982
Long Valley Finnish Structures TR
82002515 (C)

Hill, Matt, Homestead Barn
SE of McCall, McCall vicinity
11/17/1982
Long Valley Finnish Structures TR
82000362 (C)

Koski, Charles, Homestead
SE of McCall, McCall vicinity
11/17/1982
Long Valley Finnish Structures TR
82000367 (C)

McCall District Administrative Site
Jct. of W. Lake and Mission Sts., McCall
12/30/1991
91001892 (A)

Payette Lakes Club
1585 Warren Wagon Road, McCall
4/24/2017
100000906 (A, C)

Rice Meeting House
NE of McCall at Pilgrim Cove, McCall
4/9/1980
80001337 (C)

Southern Idaho Timber Protective Association (SITPA) Buildings
1001 State St., McCall
5/2/1990
90000680 (A, C)

Wargelin, Nickolai, Homestead
SE of McCall, McCall vicinity
11/17/1982
Long Valley Finnish Structures TR
82000372 (C)

SMITHS FERRY

North Fork Payette River Bridge/Rainbow Bridge
Approx. 3.0 mi. N of Smiths Ferry on ID Hwy. 55, Milepost 99.9, Smiths Ferry vicinity
4/2/1999
99000416 (C)

Southern Idaho Timber Protective Association (SITPA) Buildings
SR 55, Smiths Ferry
5/2/1990
90000681 (A, C)

THUNDER CITY

Braddock Gold Mining & Milling Co. Log Building and Forge Ruins
Off Pack Trail near Suicide Rock, Thunder City vicinity
9/12/1985
85002157 (A, C)

YELLOW PINE

Big Creek Commissary
Big Creek vicinity, Payette National Forest, Yellow Pine vicinity
4/21/2000
00000327 (A, C)

Krassel Ranger Station
S Fk Salmon R., 11.0 mi. W of Yellow Pine, Yellow Pine vicinity
11/19/1992
92000688 (A, C, D)

Stibnite Historic District
U.S. Forest Rd. 412, Yellow Pine vicinity
7/19/1987
87001186 (A)

WASHINGTON COUNTY

CAMBRIDGE

Cambridge News Office
155 N. Superior St., Cambridge
12/28/1989
89002128 (A)

Edwards/Gillette Barn
3059 Rush Creek Rd., Cambridge
2/19/2002
02000013 (C)

Jewell Building
15 N. Superior St., Cambridge
1/18/1990
89002263 (A)

Salubria Lodge #31
85 W. Central St./1st St., Cambridge
3/9/1990
90000368 (A)

Wilson House
75 N. 5th St., Cambridge vicinity
1/6/2004
03001369 (C)

WEISER

Anderson-Elwell House
547 W. 1st St., Weiser
11/17/1982
Tourtellotte and Hummel Architecture TR
82000373 (C)

Baptist Church
744 E. Main, Weiser
10/7/1977
77000470 (C)

Butterfield Livestock Company House
737 Jenkins Creek Road, Weiser vicinity
11/17/1982
Tourtellotte and Hummel Architecture TR
82000374 (C)

Drake, Col. C. F., Residence
516 E. Main, Weiser
1/20/1978
78001104 (C)

Fisher, James M., house
598 Pioneer Rd., Weiser
9/4/1986
86002146 (C)

Galloway, Thomas C., House
1120 E. 2nd St., Weiser
1/26/1978
78001105 (B, C)

Haas, Bernard, House
377 E. Main, Weiser
5/22/1978
78001106 (C)

Haas, Herman, House
253 W. Idaho St., Weiser
11/17/1982
Tourtellotte and Hummel Architecture TR
82000375 (C)

Institute Canal Company Pump House
S. end of Fairview St. at the Galloway Canal, Weiser
5/8/2017
100000958 (A)

Intermountain Institute
Paddock Ave., Weiser
11/1/1979
79000811 (B, C)

Knights of Pythias Lodge Hall
30 E. Idaho St., Weiser
5/13/1976
76000683 (A, C)

Kurtz-Van Sicklin House
253 W. Main, Weiser
11/17/1982
Tourtellotte and Hummel Architecture TR
82000376 (C)

Larson, Archie, House
S of Weiser on Larsen Rd., Weiser vicinity
11/17/1982
Tourtellotte and Hummel Architecture TR
82000377 (C)

Nesbit, G.V., House
308 W. Liberty, Weiser
11/17/1982
Tourtellotte and Hummel Architecture TR
82000378 (C)

Numbers, Dr. J. R., House
240 W. Main, Weiser
11/17/1982
Tourtellotte and Hummel Architecture TR
82000379 (C)

Sommer, Morris, House
548 W. 2nd, Weiser
11/17/1982
Tourtellotte and Hummel Architecture TR
82000380 (C)

Sommercamp, Mary Elizabeth, House
411 W Third, Weiser
11/17/1982
Tourtellotte and Hummel Architecture TR
82000381 (C)

St. Agnes Catholic Church
204 E. Liberty St., Weiser
7/24/1978
78001107 (C)

St. Luke's Episcopal Church
E. Liberty St., Weiser
7/24/1978
78001108 (C)

Star Theatre
342 State St., Weiser
11/30/1999
Motion Picture Theater Buildings in Idaho MPS
99001413 (A)

Varian, B.S., House
241 W. Main, Weiser
11/17/1982
Tourtellotte and Hummel Architecture TR
82000382 (C)

Washington County Courthouse
256 E. Court St., Weiser
9/28/1987
County Courthouses in Idaho MPS
87001602 (A, C)

Watlington, Benjamin, House
206 W. Court, Weiser
4/26/1991
91000458 (A, C)

Weiser Oregon Short Line Railroad Depot
One State St., Weiser
2/7/2007
07000006 (A, C)

Weiser Post Office
Main & W. 1st., Weiser
11/17/1982
Tourtellotte and Hummel Architecture TR
82000383 (C)

Idaho State Historical Society

Appendix 5-D

FIRMs and Wetlands Maps

THIS PAGE WAS INTENTIONALLY LEFT BLANK

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community **map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Idaho State Plane west zone (FIPSZONE 1103). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by USGS, USDA NRCS and NFS, US BLM, NOAA NGS, Idaho DPR, Idaho Geospatial Data Clearinghouse, and Kootenai County GIS. The information was compiled at a scale of 1:24000 during the time period 2001-2007.

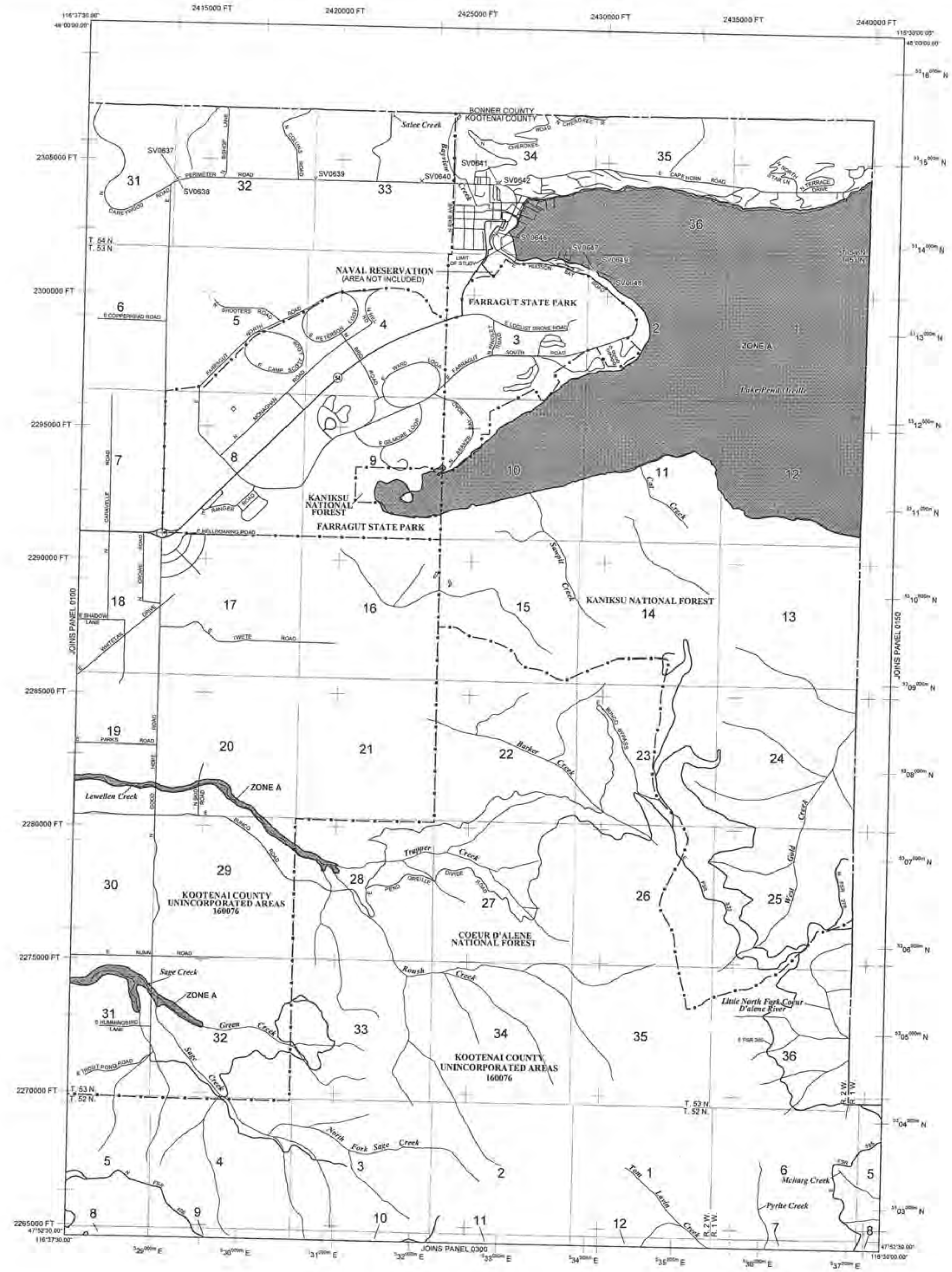
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a *Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

(A)———(A)	Cross section line
(23)- - - -(23)	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN	1000-meter Universal Transverse Mercator grid ticks, zone 11
6000000 FT	5000-foot grid ticks: Idaho State Plane coordinate system, west zone (FIPSZONE 1103), Transverse Mercator
DX5510	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
May 3, 2010
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET

600 0 600 1200 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0125E

FIRM
FLOOD INSURANCE RATE MAP
KOOTENAI COUNTY, IDAHO
AND INCORPORATED AREAS

PANEL 125 OF 975
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
KOOTENAI COUNTY	160076	0125	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
16055C0125E

EFFECTIVE DATE
MAY 3, 2010

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by the State of Idaho. This information was compiled from the U.S. Geological Survey (2007), University of Idaho (2007), Bureau of Land Management (2005), Bonner County GIS Department (2007), NGS (2007), and USDA-FSA (2004) at a scale of 1:24,000.

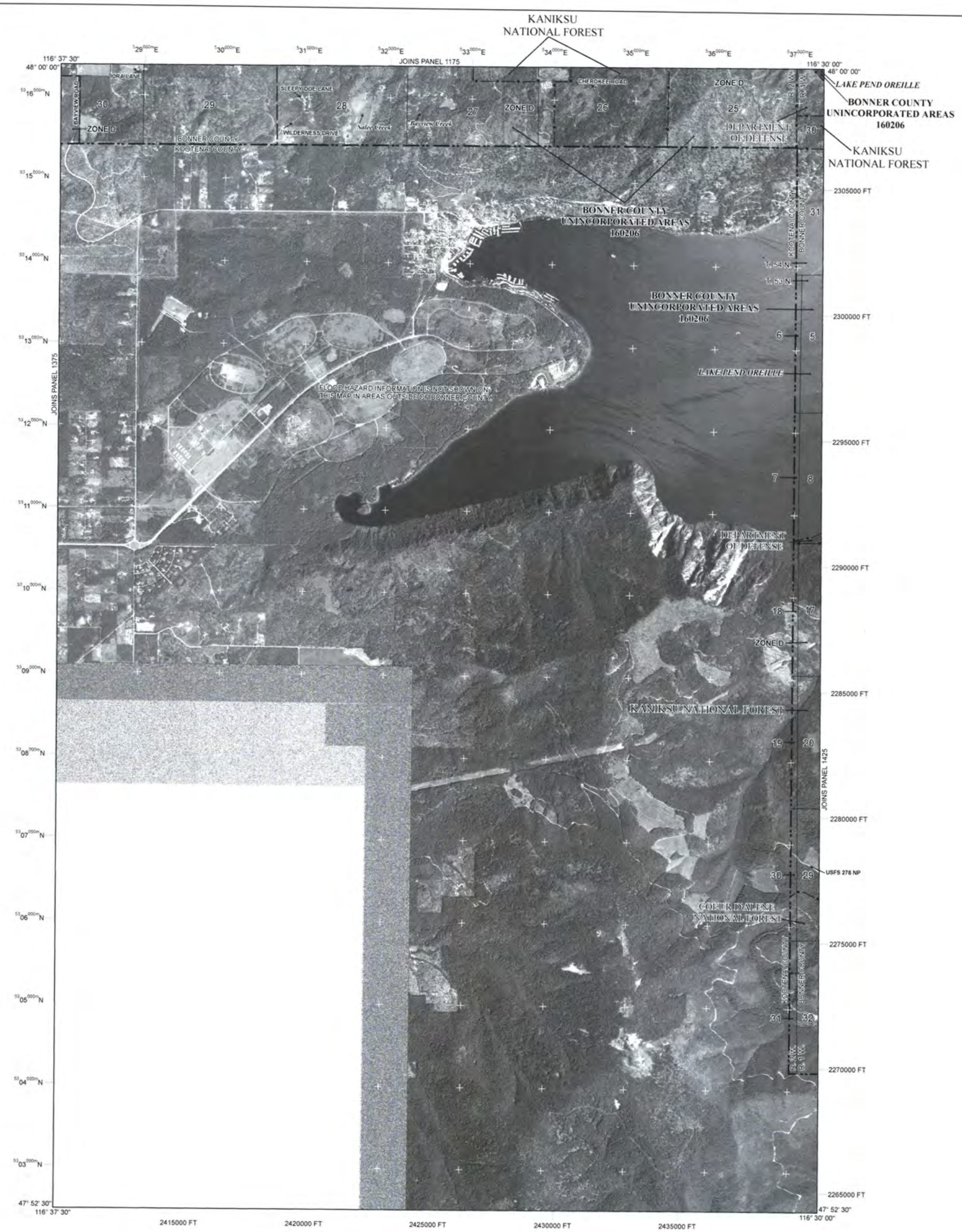
The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 - - - - - 23	Transect line
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT	5000-foot ticks: Idaho State Plane West Zone (FIPS Zone 1103), Transverse Mercator projection
$^{49}89^{000m}$ N	1000-meter Universal Transverse Mercator grid values, zone 11N
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP

NOVEMBER 18, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET

600 0 600 1200 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1400E

FIRM

FLOOD INSURANCE RATE MAP

BONNER COUNTY, IDAHO AND INCORPORATED AREAS

PANEL 1400 OF 1475

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BONNER COUNTY	160206	1400	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
16017C1400E

EFFECTIVE DATE
NOVEMBER 18, 2009

Federal Emergency Management Agency

U.S. Fish and Wildlife Service

National Wetlands Inventory

Bayview Water and Sewer District

September 28, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

U.S. Fish and Wildlife Service

National Wetlands Inventory

BWSD Wetland Map

September 28, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Appendix 5-E

Wild and Scenic Rivers Maps and List

THIS PAGE WAS INTENTIONALLY LEFT BLANK

NATIONAL WILD AND SCENIC RIVERS SYSTEM

Designations as of November 2016

The National Wild and Scenic Rivers System

Established by Congress under the Wild and Scenic Rivers Act of 1968, the National Wild and Scenic Rivers System was created to preserve the free-flow, water quality, and outstanding natural, cultural, and recreational values of select rivers for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection.

More information about the National Wild and Scenic Rivers System or specific designated rivers can be found at the Interagency Wild & Scenic Rivers Coordinating Council's website, www.rivers.gov, or by contacting one of the federal river administering agencies:

U.S. Forest Service
www.fs.fed.us

National Park Service
www.nps.gov/wsr

Bureau of Land Management
www.blm.gov

U.S. Fish and Wildlife Service
www.fws.gov

Names of Numbered Wild and Scenic Rivers

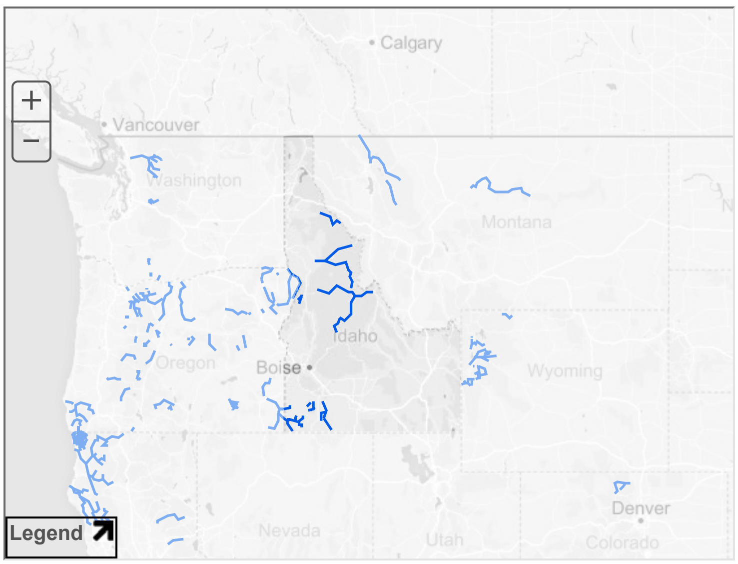
1 Sandy	15 Deschutes	30 Donner und Blitzen
2 Zig Zag	16 North Fork Crooked	31 Wildhorse Creek and Kiger Creek
3 Middle Fork Hood	17 Whychus Creek	32 North Fork Owyhee
4 East Fork Hood	18 North Fork Smith	33 Red Canyon
5 Fifteenmile Creek	19 River Styx	34 South Fork Owyhee
6 White	20 Big Marsh	35 Battle Creek
7 Salmon	21 Crescent Creek	36 Deep Creek
8 Clackamas	22 Little Deschutes	37 Dickshooter Creek
9 Collawash	23 Crooked	38 Little Jacks Creek
10 Fish Creek	24 North Fork Crooked	39 Big Jacks Creek
11 South Fork Clackamas	25 South Fork John Day	40 Duncan Creek and Wickahoney Creek
12 Roaring and South Fork Roaring	26 North Fork John Day	41 Cottonwood Creek
13 Eagle Creek	27 North Powder	42 Sheep Creek
14 Metolius	28 Joseph Creek	
	29 Lostine	

Prepared by the USDA Forest Service
Geospatial Service and Technology Center Salt Lake City, UT 2016.

The USDA Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. Using GIS products for purposes other than those for which they were inteded may yield inaccurate or misleading results.

IDAHO

Idaho has approximately 107,651 miles of river, of which 891 miles are designated as wild & scenic—less than 1% of the state's river miles.



+ View larger map

Choose A State Go
Choose A River Go

Seen as barren by the first explorers to today's first-time visitors, the rivers of the high desert simply hide their treasures well.

Battle Creek
Big Jacks Creek
Bruneau River
Bruneau River (West Fork)
Clearwater River (Middle Fork)
Cottonwood Creek
Deep Creek
Dickshooter Creek
Duncan Creek
Jarbidge River
Little Jacks Creek
Owyhee River
Owyhee River (North Fork)
Owyhee River (South Fork)
Rapid River
Red Canyon
St. Joe River
Salmon River
Salmon River (Middle Fork)

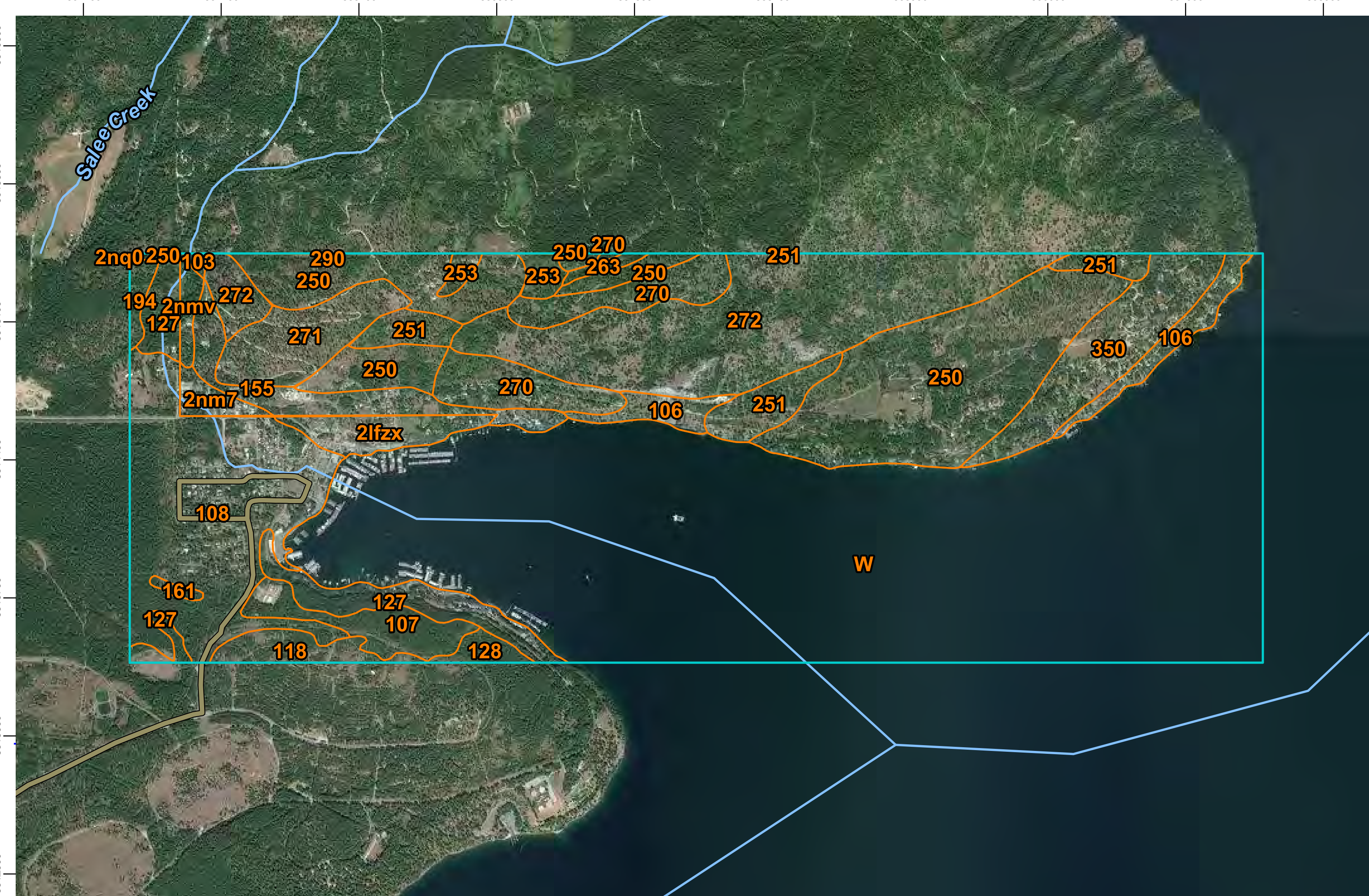
Sheep Creek
Snake River
Wickahoney Creek

Appendix 5-F

Soil Map

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Soil Map—Idaho Panhandle National Forest, Idaho-Washington-Montana, and Kootenai County Area, Idaho
(BWSD)



Map Scale: 1:31,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 450 900 1800 2700

Feet: 0 1500 3000 6000 9000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Idaho Panhandle National Forest, Idaho-Washington-Montana
Survey Area Data: Version 5, Sep 14, 2018

Soil Survey Area: Kootenai County Area, Idaho
Survey Area Data: Version 16, Sep 13, 2018

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 15, 2010—Aug 23, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2nm7	Bonner gravelly silt loam, 0 to 8 percent slopes	14.7	0.5%
2nmv	Kootenai gravelly silt loam, 20 to 45 percent slopes	11.7	0.4%
2nq0	Treble-Rock outcrop association, 20 to 65 percent slopes	1.2	0.0%
103	Glaciercreek-Typic Udifluvents-Marblecreek families, complex, granitic alluvial substratum, narrow valley bottoms and toeslopes	2.1	0.1%
106	Pearsoncreek-Marblecreek-Newbell families, complex, glaciated stream breaklands, metasedimentary belt geology	48.2	1.6%
155	Caribouridge-Stien families, complex, outwash plains of mixed geology	58.2	2.0%
250	Highfalls-Pearsoncreek-Newbell families, complex, glaciated mountain slopes, belt geology, south aspects	370.5	12.5%
251	Highfalls-Pearsoncreek-Newbell families, complex, moderately steep glaciated mountain slopes, belt geology, south aspects	63.2	2.1%
253	Pearsoncreek-Highfalls-Newbell families, complex, shallow incised glaciated mountain slopes, belt geology, south aspects	17.1	0.6%
263	Pearsoncreek-Highfalls families, complex, dissected glaciated mountain slopes, belt geology, north aspects	5.4	0.2%
270	Pepoon-Newbell families-Rock outcrop complex, glaciated scoured ridges and upper mountain slopes, belt geology, south aspects	92.3	3.1%
271	Newbell-Pepoon families-Rock outcrop complex, glaciated scoured mountain slopes, belt geology, south aspects	67.4	2.3%

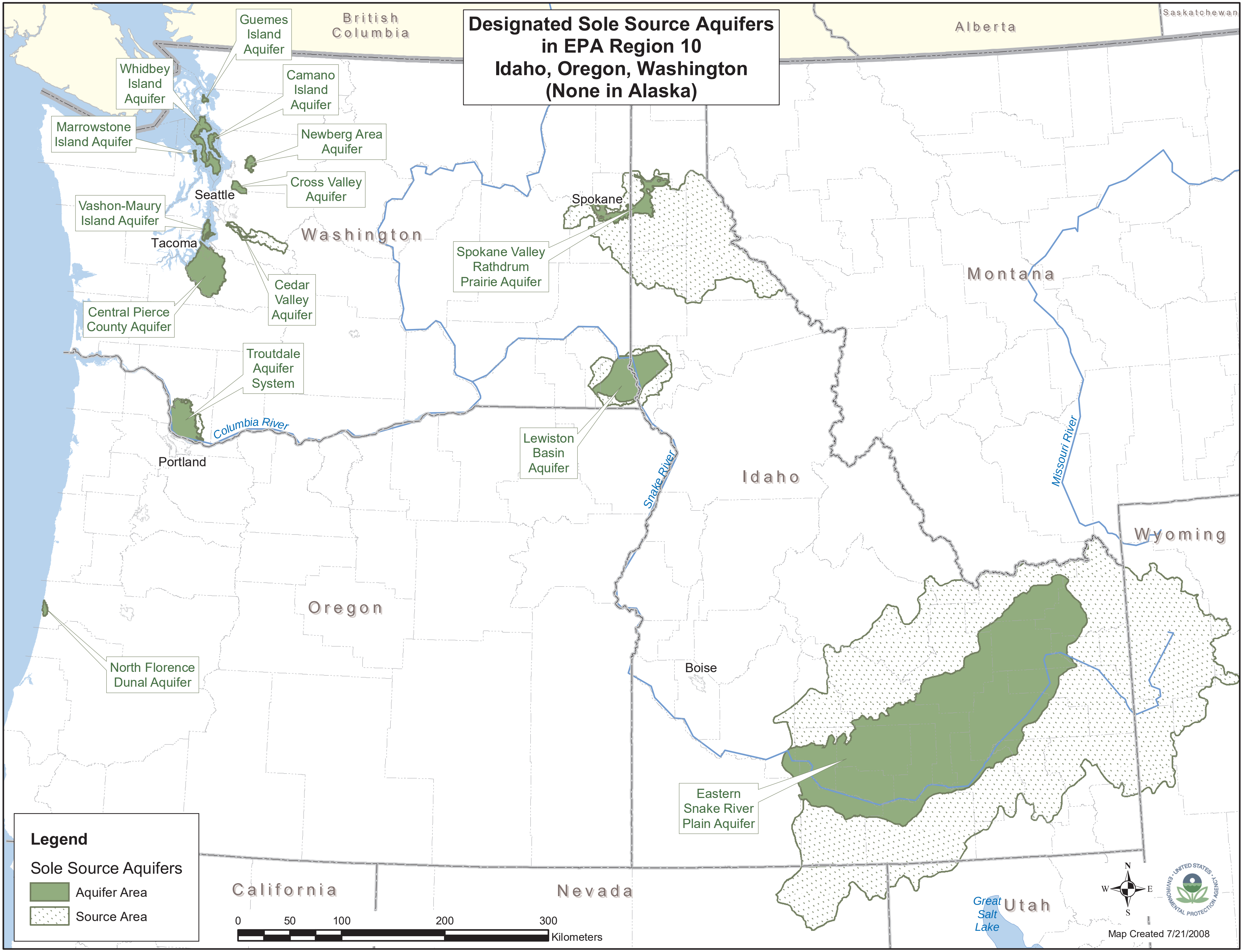
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
272	Pepoon-Newbell families-Rock outcrop complex, glaciated steep scoured mountain slopes, belt geology, south aspects	305.2	10.3%
290	Pearsoncreek-Highfalls-Newbell families, complex, glaciated mountain slopes, belt geology, all aspects	1.4	0.0%
350	Andic Humudepts-Humic Udivitrands-Pearsoncreek families, dense substratum complex, glaciated mountain slopes, granitic geology, south aspects	96.8	3.3%
W	Water	1,338.6	45.1%
Subtotals for Soil Survey Area		**2,494.0**	**84.1%**
Totals for Area of Interest		**2,966.8**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2lfzx	Caribouridge-Stien families, complex, outwash plains of mixed geology	36.7	1.2%
107	Bonner silt loam, 0 to 8 percent slopes	45.3	1.5%
108	Bonner gravelly silt loam, 0 to 8 percent slopes	257.3	8.7%
118	Dystrochreptic Arents, 0 to 20 percent slopes	28.6	1.0%
127	Kootenai gravelly silt loam, 20 to 45 percent slopes	80.1	2.7%
128	Kootenai cobbly silt loam, 0 to 7 percent slopes	11.9	0.4%
161	Rathdrum silt loam, 0 to 7 percent slopes	3.4	0.1%
194	Treble-Rock outcrop association, 20 to 65 percent slopes	9.5	0.3%
Subtotals for Soil Survey Area		**472.8**	**15.9%**
Totals for Area of Interest		**2,966.8**	**100.0%**

Appendix 5-G

Sole Source Aquifer Map

THIS PAGE WAS INTENTIONALLY LEFT BLANK



Designated Sole Source Aquifers
in EPA Region 10
Idaho, Oregon, Washington
(None in Alaska)
British Columbia
Alberta
Saskatchewan
Guemes Island Aquifer
Whidbey Island Aquifer
Camano Island Aquifer
Marrowstone Island Aquifer
Newberg Area Aquifer
Cross Valley Aquifer
Seattle
Vashon-Maury Island Aquifer
Tacoma
Washington
Spokane
Spokane Valley Rathdrum Prairie Aquifer
Cedar Valley Aquifer
Central Pierce County Aquifer
Montana
Troutdale Aquifer System
Columbia River
Portland
Lewiston Basin Aquifer
Snake River
Missouri River
Idaho
Wyoming
Oregon
North Florence Dunal Aquifer
Boise
Eastern Snake River Plain Aquifer
Legend
Sole Source Aquifers
Aquifer Area
Source Area
0
50
100
200
300
Kilometers
California
Nevada
Great Salt Lake
Utah
N
W
E
S
Map Created 7/21/2008

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Appendix 5-H

Climate Data

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Back to:
State Map | Western U.S. map | Home Page

NOTE:
To print data frame (right side), click on right frame before printing.

1981 - 2010

- Daily Temp. & Precip.
- Daily Tabular data (~23 KB)
- Monthly Tabular data (~1 KB)
- NCDC 1981-2010 Normals (~3 KB)

1971 - 2000

- Daily Temp. & Precip.
- Daily Tabular data (~23 KB)
- Monthly Tabular data (~1 KB)
- NCDC 1971-2000 Normals (~3 KB)

1961 - 1990

- Daily Temp. & Precip.
- Daily Tabular data (~23 KB)
- Monthly Tabular data (~1 KB)
- NCDC 1961-1990 Normals (~3 KB)

Period of Record

BAYVIEW MODEL BASIN, IDAHO (100667)

Period of Record Monthly Climate Summary

Period of Record : 04/01/1947 to 06/10/2016

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	34.8	38.9	45.5	54.5	64.0	71.3	79.9	79.1	68.9	55.3	42.8	35.9	55.9
Average Min. Temperature (F)	21.3	23.8	27.0	32.2	38.3	44.8	48.7	47.6	40.7	33.2	28.0	23.0	34.0
Average Total Precipitation (in.)	2.91	2.06	2.13	1.77	2.03	1.89	0.94	1.02	1.18	2.10	3.07	3.10	24.20
Average Total SnowFall (in.)	14.2	5.1	2.7	0.2	0.0	0.0	0.0	0.0	0.0	0.1	3.1	11.7	37.1
Average Snow Depth (in.)	4	3	1	0	0	0	0	0	0	0	0	2	1

Percent of possible observations for period of record.
Max. Temp.: 98% Min. Temp.: 97.9% Precipitation: 97.7% Snowfall: 93.5% Snow Depth: 89.4%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

BRADSHAW ARMY AIRFIELD (PHSF)	2007-2011	8.7	8.3	10.7	8.7	9.3	8.4	9.7	9.3	7.9	4.6	6.9	6.8	8.3
HILO INTERNATIONAL AIRPORT (PHTO)	2001-2011	6.1	6.6	6.5	6.4	6.2	6.1	6.1	5.9	5.8	5.8	5.7	5.8	6.1
HONOLULU INTERNATIONAL AP (PHNL)	2001-2011	8.7	9.0	10.0	11.0	10.2	11.9	12.1	12.2	10.7	9.9	9.2	9.4	10.4
KAHULUI AIRPORT (PHOG)	2001-2011	10.8	10.9	11.6	12.6	12.1	14.8	14.9	14.8	13.2	11.7	10.9	10.7	12.4
KALAELOA AIRPORT (PHJR)	2001-2011	7.3	6.7	7.4	7.2	6.7	6.9	7.0	6.9	6.4	6.1	6.0	6.6	6.8
KANEOHE MCAS (PHNG)	2007-2011	7.6	7.4	9.6	8.6	7.8	8.9	8.5	8.9	7.8	7.7	8.4	7.5	8.2
KEKAHA-BARKING SANDS (PHBK)	2007-2011	6.7	7.0	5.8	5.9	5.4	5.2	5.0	5.0	5.0	5.0	5.3	6.0	5.6
KONA INTL AT KEAHOLE ARPT (PHKO)	2001-2011	7.8	8.0	8.1	7.9	7.6	7.7	7.9	7.9	7.5	7.2	7.1	7.4	7.7
LIHUE AIRPORT (PHLI)	2001-2011	11.8	12.4	12.8	13.7	12.1	13.9	14.2	14.0	12.9	12.5	12.4	12.3	12.9
MOLOKAI AIRPORT (PHMK)	2001-2011	9.5	10.0	10.6	11.4	10.4	12.8	13.3	13.0	11.4	10.5	9.9	9.8	11.1

IDAHO

STATION	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
BOISE AIR TERMINAL (KBOI)	2001-2011	6.4	7.1	8.5	8.5	8.1	7.8	7.1	7.0	6.9	6.6	6.8	7.1	7.3
BURLEY MUNICIPAL AIRPORT (KBYI)	2001-2011	8.7	8.5	9.6	9.7	8.5	7.7	6.3	6.2	6.2	7.3	8.2	8.7	8.0
CHALLIS AIRPORT (KLLJ)	2001-2011	2.1	2.8	4.8	5.8	5.8	5.6	5.1	4.6	3.8	3.5	2.8	2.2	4.1
ELK CITY (KP69)	2001-2011	1.6	1.5	1.6	1.8	1.8	1.9	2.0	1.9	1.6	1.1	1.5	1.8	1.7
IDAHO FALLS REGIONAL ARPT (KIDA)	2001-2011	7.1	7.5	10.0	10.3	10.2	9.6	8.0	7.9	7.5	8.2	8.3	7.7	8.5
JEROME COUNTY AIRPORT (KJER)	2001-2011	11.4	12.0	11.5	11.1	10.3	9.6	7.5	7.1	8.0	9.1	10.3	10.9	9.9
LEWISTON-NEZ PERCE COUNTY AP (KLWS)	2001-2011	6.4	5.6	6.0	6.0	5.5	5.3	5.4	5.0	4.7	4.6	5.4	5.7	5.4
MCCALL MUNICIPAL AIRPORT (KMYL)	2001-2011	2.5	3.1	4.1	4.9	5.3	4.7	4.2	4.3	3.9	3.6	3.2	3.1	3.9
MULLAN PASS (KMLP)	2001-2011	5.5	5.4	6.1	5.6	5.4	5.2	4.9	4.8	5.2	5.8	6.2	5.5	5.5
POCATELLO REGIONAL AIRPORT (KPIH)	2001-2011	8.5	8.0	10.7	11.1	10.5	9.7	8.3	8.3	8.1	8.8	9.1	9.1	9.2
REXBURG-MADISON COUNTY APT (KRXE)	2001-2011	4.9	5.3	8.3	9.0	9.0	7.9	6.7	6.9	6.4	6.8	6.6	5.9	7.0
STANLEY RANGER STATION (KSNT)	2001-2011	2.2	2.7	3.7	3.8	4.2	4.1	4.0	3.8	3.4	2.9	2.7	2.6	3.3
TWIN FALLS-MAGIC VLY RGN APT (KTWF)	2001-2011	9.5	10.2	11.8	11.9	11.1	10.5	9.7	9.6	9.8	10.3	9.9	10.1	10.4

MONTANA

STATION	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
BAKER MUNICIPAL AIRPORT (KBHK)	2001-2011	10.7	10.4	11.8	12.3	12.9	11.1	10.1	10.5	10.0	10.3	10.3	10.2	10.9
BELGRADE/BOZEMAN-GALLATIN PA (KBZN)	2001-2011	4.6	4.9	6.2	6.9	6.6	5.9	5.8	6.0	5.6	5.3	4.9	4.6	5.6
BILLINGS LOGAN INTL AP (KBIL)	2001-2011	13.7	12.2	10.6	10.3	10.3	9.2	8.9	8.9	8.9	10.3	12.3	12.9	10.7
BUTTE-BERT MOONEY AIRPORT (KBTM)	2001-2011	4.2	4.3	6.0	6.7	6.8	6.2	5.9	5.7	5.3	5.4	4.6	4.1	5.4
CUT BANK MUNICIPAL AIRPORT (KCTB)	2001-2011	15.0	12.2	13.4	13.1	12.8	11.7	10.3	9.7	10.7	12.6	14.7	13.6	12.5
DILLON AIRPORT (KDLN)	2001-2011	10.3	9.6	10.1	9.8	9.2	7.9	7.4	7.6	8.0	8.9	9.2	8.7	8.9
GLASGOW INTL AIRPORT (KGGW)	2001-2011	9.1	9.1	11.1	12.0	12.3	10.5	10.2	10.6	10.1	10.0	9.3	9.0	10.3
GREAT FALLS INTERNATIONAL AP (KGTF)	2001-2011	13.8	11.6	12.0	11.0	10.6	9.6	9.0	8.8	9.7	11.6	14.1	13.3	11.3
GREAT FALLS-MALMSTROM FIELD (KGFA)	2005-2011	13.4	10.3	11.2	10.6	9.8	9.3	7.8	8.2	8.3	10.8	13.1	12.4	10.4
HAVRE CITY-COUNTY AIRPORT (KHVR)	2001-2011	10.6	9.6	10.4	10.9	11.0	9.7	9.0	8.9	8.8	9.7	10.9	10.1	10.0
HELENA REGIONAL AIRPORT (KHLN)	2001-2011	5.6	6.0	7.4	8.1	8.0	7.6	6.9	6.3	6.1	6.3	6.1	5.2	6.6
JORDAN AIRPORT (KJDN)	2001-2011	7.8	7.6	8.8	9.8	10.3	8.9	8.0	8.3	7.9	8.1	8.0	7.3	8.4
KALISPELL-GLACIER PARK AP (KGPI)	2001-2011	3.8	3.9	6.1	6.9	6.7	5.7	5.1	5.1	4.7	4.3	4.0	3.7	5.0
LEWISTOWN MUNICIPAL ARPT (KLWT)	2001-2011	10.8	9.2	10.0	9.7	9.7	8.5	7.6	7.8	8.2	9.1	10.6	10.3	9.3
LIVINGSTON-MISSION FIELD (KLVM)	2001-2011	20.0	16.7	15.4	13.3	11.9	10.4	9.4	10.2	10.7	13.7	18.5	19.2	14.1
MILES CITY-FRANK WILEY FIELD (KMLS)	2001-2011	9.1	9.0	10.0	10.8	11.1	9.6	9.1	9.4	9.2	9.4	9.3	8.9	9.6
MISSOULA INTERNATIONAL AP (KMSO)	2001-2011	3.3	3.7	5.2	6.2	6.0	5.6	5.5	5.1	4.2	3.8	3.6	3.6	4.7
WOLF POINT-L M CLAYTON AP (KOLF)	2001-2011	7.3	7.4	8.7	9.7	10.0	8.3	7.7	7.9	7.4	7.6	7.1	7.1	8.0

NEVADA

STATION	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
CALIENTE AIRPORT (KP38)	2001-2002	2.3	3.1	3.6	5.1	4.4	4.8	4.5	4.0	3.2	2.5	2.4	1.6	3.5
ELKO REGIONAL AIRPORT (KEKO)	2001-2011	4.4	5.3	6.3	6.9	6.5	6.4	5.8	5.5	5.1	4.8	4.9	4.9	5.6
ELY AIRPORT/YELLAND FIELD (KELY)	2001-2011	8.8	8.8	9.2	10.0	9.3	9.5	9.0	9.3	9.3	8.9	8.6	8.8	9.1
EUREKA AIRPORT (KP68)	2001-2011	5.3	5.9	7.5	8.1	7.5	7.6	7.2	7.2	7.0	6.6	5.9	5.8	6.8
FALLON NAS (KNFL)	2006-2011	4.6	6.1	7.5	8.1	7.3	6.9	6.1	5.9	5.3	5.2	5.2	4.8	6.1
INDIAN SPRING AUX AIRFIELD (KINS)	2007-2011	5.0	5.8	6.8	8.2	8.6	7.8	7.9	7.5	6.9	6.0	4.4	4.8	6.6
LAS VEGAS-MCCARRAN INT'L AP (KLAS)	2001-2011	6.0	6.8	8.2	9.8	9.0	9.1	7.8	7.7	7.1	6.6	5.9	5.7	7.5
LOVELOCK-DERBY FIELD AIRPORT (KLOL)	2001-2011	3.7	5.2	6.8	7.7	7.9	7.9	7.0	6.3	5.6	5.1	4.5	4.0	6.0
MERCURY-DESERT ROCK AIRPORT (KDRA)	2001-2011	8.0	8.3	8.9	10.7	9.7	9.6	8.8	8.8	8.2	7.7	7.7	7.6	8.7
NORTH LAS VEGAS AIRPORT (KVGT)	2001-2011	6.6	7.1	8.3	9.8	8.9	8.7	7.5	7.5	7.2	6.7	6.3	6.2	7.6
RENO/TAHOE INTERNATIONAL AP (KRNO)	2001-2011	3.8	5.1	7.0	8.1	7.9	7.7	6.8	6.3	5.3	4.6	4.6	4.7	6.0
TONOPAH AIRPORT (KTPH)	2001-2011	8.7	9.3	10.6	11.7	10.8	10.4	8.8	8.8	9.0	9.3	8.9	8.4	9.6
TONOPAH TEST RANGE #74 (KBJN)	2007-2011	9.3	9.2	11.4	13.2	9.5	8.6	9.6	9.6	9.4	10.1	8.4	8.3	9.7
WINNEMUCCA MUNICIPAL AIRPORT (KWMC)	2001-2011	6.4	7.2	8.0	8.0	7.8	7.8	7.3	7.1	6.4	6.2	6.3	6.9	7.1

LIHUE AIRPORT ASOS	PHLI	1996-2006	12.0	12.5	12.5	14.4	12.8	14.2	14.8	13.6	13.0	12.7	12.8	12.5	13.1
MOLOKAI AIRPORT ASOS	PHMK	1996-2006	10.2	10.7	10.6	12.5	11.3	13.2	14.0	13.3	11.8	11.4	10.8	10.3	11.7
WAHIAWA-WHEELER ARMY AF	PHHI	1996-2006	8.9	9.2	9.3	9.9	9.4	10.1	10.0	9.8	9.3	8.1	7.6	8.3	9.1

IDAHO

AVERAGE WIND SPEED - MPH

STATION	ID	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
BOISE AIRPORT ASOS	KBOI	1996-2006	6.7	8.1	9.0	8.8	8.1	8.3	7.4	7.4	7.3	7.2	7.0	7.4	7.7
BURLEY AIRPORT ASOS	KBYI	1996-2006	9.2	9.3	10.3	9.9	9.3	8.6	7.0	6.9	6.8	7.9	8.5	9.4	8.6
CALDWELL AIRPORT AWOS	KEUL	1997-2006	5.8	7.5	7.9	7.7	6.7	6.6	5.6	5.3	5.0	5.3	5.8	6.1	6.2
CHALLIS AIRPORT ASOS	KLLJ	1998-2006	1.9	2.8	5.0	6.1	6.2	6.1	5.5	4.8	4.0	3.6	2.8	2.2	4.2
COEUR D'ALENE AP AWOS	KCOE	1996-2006	7.8	7.5	8.3	7.9	7.6	7.2	6.7	6.6	6.7	6.8	7.5	7.7	7.3
HAILEY-SUN VLY AP AWOS	KSUN	1996-2006	4.1	4.6	5.9	6.7	7.6	7.7	8.1	7.9	7.5	6.4	4.5	3.9	6.2
IDAHO FALLS AP ASOS	KIDA	1996-2006	8.2	8.1	10.1	10.6	10.8	9.9	8.6	8.3	8.1	8.8	8.4	8.0	9.0
JEROME AIRPORT ASOS	KJER	1998-2006	11.3	12.5	11.7	11.2	10.6	10.2	7.6	7.4	8.4	9.5	10.2	10.7	10.1
LEWISTON AIRPORT ASOS	KLWS	1996-2006	6.2	6.0	6.3	6.0	5.8	5.8	5.7	5.5	4.8	4.7	5.3	6.1	5.7
LOWELL R.S. ASOS	KP69	1996-2006	1.5	1.6	1.7	1.9	1.8	1.9	1.9	1.8	1.6	1.1	1.4	1.7	1.7
MCCALL AIRPORT ASOS	KMYL	1997-2006	2.7	3.3	4.1	5.1	5.6	5.0	4.2	4.3	4.0	3.8	3.2	2.9	4.0
MOUNTAIN HOME AFB	KMUO	1996-2006	9.9	11.7	11.4	11.1	10.2	10.2	9.0	8.8	8.7	9.2	9.1	10.0	10.0
MULLAN PASS ASOS	KMLP	1996-2006	5.2	6.4	7.4	6.9	6.8	6.9	6.1	6.0	6.5	7.1	7.3	5.2	6.5
POCATELLO AIRPORT ASOS	KPIH	1996-2006	9.6	9.0	10.9	11.2	11.0	10.3	8.7	8.8	8.5	9.4	9.2	9.6	9.7
REXBURG AIRPORT ASOS	KRXE	1998-2006	5.6	6.2	8.8	9.7	9.7	8.6	7.5	7.3	6.9	7.4	7.0	5.9	7.5
SALMON AIRPORT AWOS	KSMN	1996-2006	1.8	2.2	4.2	4.8	4.7	4.4	4.0	3.8	3.1	2.9	2.5	2.1	3.3
SANDPOINT AIRPORT AWSO	KSZT	2003-2006	4.8	4.2	4.6	5.1	5.0	4.9	4.1	3.6	3.4	3.9	4.9	4.2	4.4
STANLEY ASOS	KSNT	1998-2006	2.2	2.8	3.8	3.9	4.1	4.2	4.1	3.9	3.3	2.9	2.6	2.5	3.3
TWIN FALLS AIRPORT ASOS	KTWF	1996-2006	10.0	10.9	11.9	11.8	11.3	11.0	9.9	9.9	10.2	10.9	10.0	10.4	10.7

MONTANA

AVERAGE WIND SPEED - MPH

STATION	ID	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
BAKER AIRPORT ASOS	KBHK	1998-2006	10.4	10.5	12.2	12.5	12.7	11.7	10.7	10.8	10.0	10.3	10.5	10.7	11.1
BILLINGS-LOGAN AP ASOS	KBIL	1996-2006	12.8	12.2	11.0	10.5	10.4	10.0	9.3	9.2	9.6	10.3	12.0	13.0	10.9
BOZEMAN AIRPORT ASOS	KBZN	1996-2006	4.6	5.3	6.4	7.2	7.0	6.3	6.3	6.4	6.1	5.7	4.9	4.8	5.9
BUTTE AIRPORT ASOS	KBTM	1996-2006	4.7	5.0	6.8	7.3	7.7	7.3	6.9	6.6	6.2	6.2	5.2	4.9	6.2
CUT BANK AIRPORT ASOS	KCTB	1996-2006	14.6	12.8	13.3	12.8	13.4	12.3	11.2	10.2	11.4	13.0	13.6	14.6	12.8

LIMON MUNI AP, CO (KLIC). W	N	N	N	N	N	S	S	S	N	N	N	N	N
MEEKER AIRPORT, CO (KEEO).	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	NE	NE	NE	NE
MONTROSE AP, CO (KMTJ). WIN	SE	SSE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	SSE	SE
MONARCH PASS, CO (KMYP). WI	WSW	WSW	WSW	WSW	WSW	WSW	NE	WSW	WSW	WSW	WSW	WSW	WSW
MONUMENT PASS, CO (KMNH). WI	SSW	S	S	S	S	S	S	S	S	S	S	SW	S
PUEBLO AIRPORT, CO (KPUB).	W	W	E	E	E	E	E	E	E	E	W	W	E
RED CLIFF PASS, CO (KCCU).	W	WNW	W	W	WSW	S	S	W	W	W	W	W	W
RIFLE AIRPORT, CO (KRIL). W	S	S	W	W	W	W	W	W	W	W	S	S	W
SPRINGFIELD AP, CO (KSPD).	W	S	S	S	S	S	S	S	S	S	S	W	S
TRINIDAD AP, CO (KTAD). WIN	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WSW
WOLF CREEK PASS, CO (KCPW).	W	W	SSW	SSW	SSW	SSW	NE	SW	SW	SSW	SSW	SW	SSW

HAWAII

PREVAILING WIND DIRECTION

STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
BRADSHAW AAF, HI (PHSF). WI	W	W	W	W	W	W	W	W	W	W	W	SE	W
HILO INT'L AP, HI (PHTO). W	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
HONOLULU INT'L AP, HI (PHNL)	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
KAHULUI AP, HI (PHOG). WIND	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
KAILUA-KONA INT'L AP, HI (PH	E	E	W	W	W	SSW	SSW	WSW	WSW	SW	S	ESE	WSW
KANEOHE MCAS, HI (PHNG). WI	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	ENE
KAPOLEI-KALEALOA AP, HI (PHJ	NE	NE	NE	ENE	NE	ENE	ENE	ENE	NE	ENE	NE	ENE	ENE
LAHAINA-KAPALUA AP, HI (PHJH	NE	NE	NE	ENE	ENE	ENE	NE	ENE	ENE	ENE	NE	NE	NE
LANAI CITY AP, HI (PHNY). W	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
LIHUE AP, HI (PHLI). WIND R	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	ENE	ENE
MOLOKAI AP-KAUNAKAKAI, HI (P	ENE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
WAHIAWA-WHEELER AAF, HI (PHH	E	E	E	E	E	E	ENE	E	ENE	E	ENE	E	E

IDAHO

PREVAILING WIND DIRECTION

STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
BOISE AP, ID (KBOI). WIND R	SE	SE	SE	NW	NW	NW	NW	NW	SE	SE	SE	ESE	SE
BURLEY AP, ID (KBYI). WIND	W	W	W	W	W	W	W	W	W	W	W	W	W
CALDWELL AIRPORT, ID (KEUL).	SSE	SSE	SSE	WNW	WNW	WNW	WNW	WNW	WNW	WNW	SSE	SE	WNW
CHALLIS AIRPORT, ID (KLLJ).	S	S	N	N	W	W	W	W	W	N	S	S	WNW
CHALLIS AP, ID (KU15). WIND	S	S	N	N	N	N	N	W	N	N	N	S	N
COEUR D'ALENE AP, ID (KCOE).	NNE	NNE	S	S	S	S	S	S	S	S	NNE	NNE	NNE
ELK CITY, ID (KP69). WIND R	N	NNE	NNE	NNE	NNE	NNE	NNE	N	N	NNE	NNE	N	NNE
HAILEY-SUN VALLEY AP, ID (KS	NNW	NNW	N	N	S	S	S	S	S	N	N	N	N
IDAHO FALLS AP, ID (KIDA).	N	N	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	N	N	SSW
JEROME AIRPORT, ID (KJER).	NE	NE	W	W	W	W	W	W	E	W	ENE	NE	W
LEWISTON AIRPORT, ID (KLWS).	S	E	E	E	WNW	E	E	WNW	E	E	E	S	E
MCCALL AIRPORT, ID (KMYL).	S	S	S	N	N	NW	S	SSW	S	S	S	S	S
MOUNTAIN HOME AFB, ID (KMUO)	ESE	ESE	ESE	NW	NW	NW	NW	NW	NW	NW	ESE	ESE	ESE
MULLAN PASS VOR, ID (KMLP).	S	S	S	SW	NW	NW	NW	NW	SW	S	S	S	S
POCATELLO AP, ID (KPIH). WI	SW	S	SW	SW	WSW	WSW	W	W	W	SW	SW	SW	SW
REXBURG AP, ID (KRXE). WIND	SSW	S	S	S	S	S	S	S	S	S	S	S	S
SALMON AIRPORT, ID (KSMN).	N	N	N	N	N	N	N	N	N	N	N	N	N
STANLEY RNGR STN, ID (KSNT).	SSE	SSE	SSE	N	S	S	S	S	S	S	S	SSE	S
TWIN FALLS AP, ID (KTWF). W	SSW	W	W	W	W	W	SSW	SSW	SSW	SSW	SSW	S	SSW

MONTANA

PREVAILING WIND DIRECTION

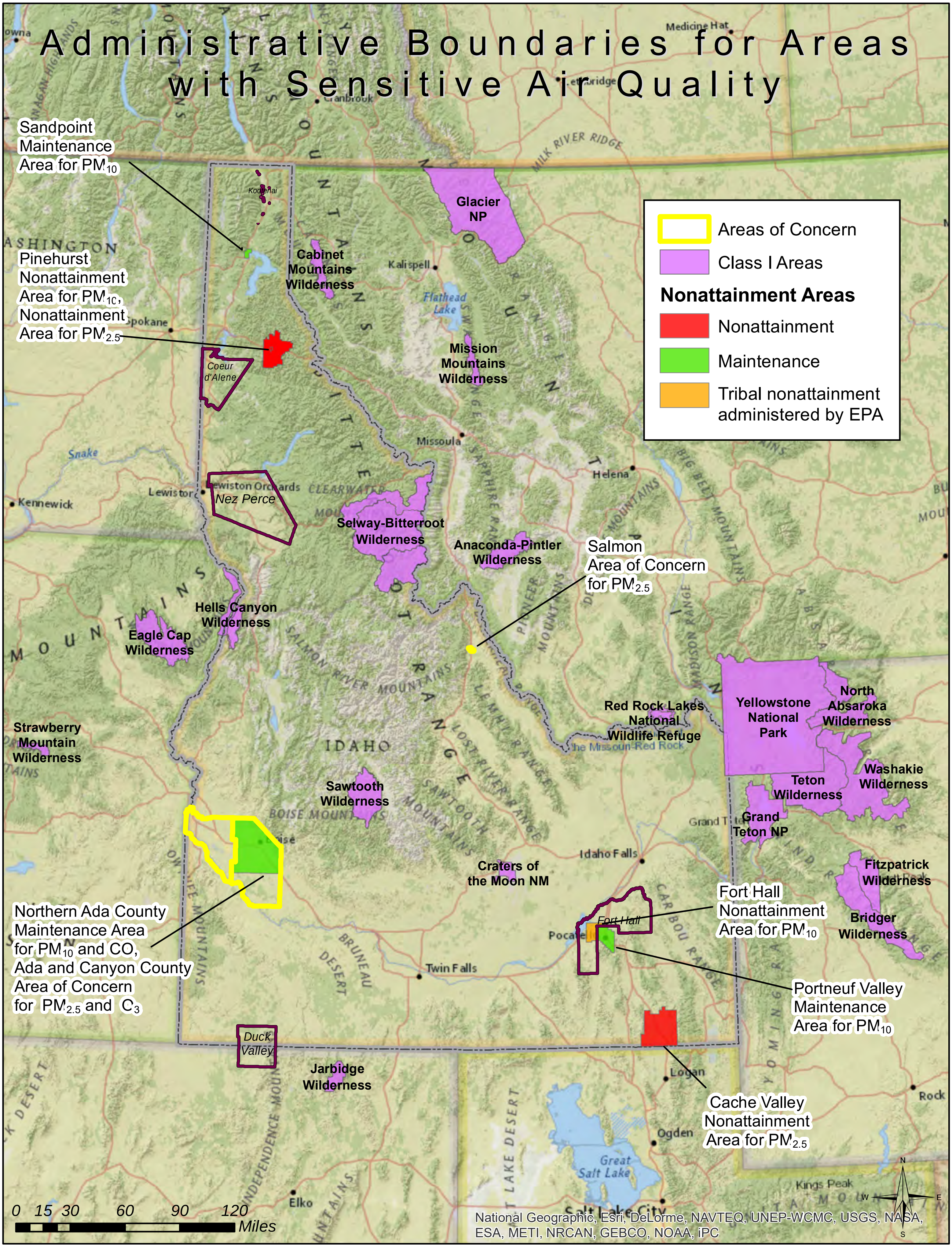
STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
BAKER MUNI AP, MT (KBHK). W	W	W	SE	SE	W	W	SE	SE	ESE	W	W	W	W
BILLINGS AP, MT (KBIL). WIN	SW	SW	SW	SW	N	N	N	SW	SW	SW	SW	SW	SW
BOZEMAN-BELGRADE AP, MT (KBZ	S	SSE	SSE	W	SE	W	SSE	SSE	SE	SE	SSE	SSE	SSE
BUTTE AP, MT (KBTM). WIND R	S	S	S	N	N	N	N	S	S	S	S	S	S
CUT BANK AP, MT (KCTB). WIN	WSW	WSW	WSW	W	W	W	W	W	W	WSW	WSW	WSW	WSW
DILLON AP, MT (KDLN). WIND	S	S	S	S	S	S	S	S	S	S	S	S	S
GLASGOW AIRPORT, MT (KGGW).	ESE	ESE	E	E	E	E	E	E	E	ESE	E	ESE	E
GLENDIVE AIRPORT, MT (KGDV).	S	S	S	NW	NW	W	NW	S	NW	S	S	S	S
GREAT FALLS AP, MT (KGTF).	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
GREAT FALLS-MALSTROM AFB, MT	SW	SW	SW	SW	SW	W	W	W	SW	SW	SW	SW	SW
HAVRE AIRPORT, MT (KHVR). W	SW	SW	SW	E	E	E	E	E	SW	SW	SW	SW	SW
HELENA AIRPORT, MT (KHLN).	W	W	W	W	W	W	W	W	W	W	W	W	W
JORDAN AIRPORT, MT (KJDN).	W	W	W	W	W	W	W	W	W	W	W	W	W

Appendix 5-I

Air Quality Nonattainment Map

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Administrative Boundaries for Areas with Sensitive Air Quality



THIS PAGE WAS INTENTIONALLY LEFT BLANK

Appendix 5-J

Socioeconomic Census Data

THIS PAGE WAS INTENTIONALLY LEFT BLANK

U.S. Census Bureau

AMERICAN FactFinder

DP03

SELECTED ECONOMIC CHARACTERISTICS

2012-2016 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Tell us what you think. Provide feedback to help make American Community Survey data more useful for you.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

Subject	ZCTA5 83803			
	Estimate	Margin of Error	Percent	Percent Margin of Error
EMPLOYMENT STATUS				
Population 16 years and over	691	+/-346	691	(X)
In labor force	510	+/-341	73.8%	+/-19.9
Civilian labor force	510	+/-341	73.8%	+/-19.9
Employed	430	+/-291	62.2%	+/-21.5
Unemployed	80	+/-129	11.6%	+/-16.5
Armed Forces	0	+/-11	0.0%	+/-4.2
Not in labor force	181	+/-110	26.2%	+/-19.9
Civilian labor force	510	+/-341	510	(X)
Unemployment Rate	(X)	(X)	15.7%	+/-22.2
Females 16 years and over	359	+/-145	359	(X)
In labor force	217	+/-126	60.4%	+/-21.4
Civilian labor force	217	+/-126	60.4%	+/-21.4
Employed	184	+/-114	51.3%	+/-21.9
Own children of the householder under 6 years	37	+/-60	37	(X)
All parents in family in labor force	37	+/-60	100.0%	+/-46.8
Own children of the householder 6 to 17 years	110	+/-137	110	(X)
All parents in family in labor force	110	+/-137	100.0%	+/-23.6
COMMUTING TO WORK				
Workers 16 years and over	430	+/-291	430	(X)
Car, truck, or van -- drove alone	155	+/-108	36.0%	+/-26.5
Car, truck, or van -- carpooled	162	+/-183	37.7%	+/-24.2
Public transportation (excluding taxicab)	0	+/-11	0.0%	+/-6.7
Walked	22	+/-34	5.1%	+/-8.7
Other means	0	+/-11	0.0%	+/-6.7
Worked at home	91	+/-88	21.2%	+/-12.5

Subject	ZCTA5 83803			
	Estimate	Margin of Error	Percent	Percent Margin of Error
Mean travel time to work (minutes)	40.9	+/-8.8	(X)	(X)
OCCUPATION				
Civilian employed population 16 years and over	430	+/-291	430	(X)
Management, business, science, and arts occupations	149	+/-100	34.7%	+/-9.1
Service occupations	72	+/-76	16.7%	+/-16.3
Sales and office occupations	195	+/-186	45.3%	+/-23.1
Natural resources, construction, and maintenance occupations	14	+/-23	3.3%	+/-5.7
Production, transportation, and material moving occupations	0	+/-11	0.0%	+/-6.7
INDUSTRY				
Civilian employed population 16 years and over	430	+/-291	430	(X)
Agriculture, forestry, fishing and hunting, and mining	0	+/-11	0.0%	+/-6.7
Construction	55	+/-69	12.8%	+/-14.9
Manufacturing	0	+/-11	0.0%	+/-6.7
Wholesale trade	0	+/-11	0.0%	+/-6.7
Retail trade	15	+/-24	3.5%	+/-6.5
Transportation and warehousing, and utilities	0	+/-11	0.0%	+/-6.7
Information	39	+/-65	9.1%	+/-15.9
Finance and insurance, and real estate and rental and leasing	14	+/-22	3.3%	+/-6.6
Professional, scientific, and management, and administrative and waste management services	146	+/-176	34.0%	+/-27.9
Educational services, and health care and social assistance	73	+/-77	17.0%	+/-12.3
Arts, entertainment, and recreation, and accommodation and food services	45	+/-68	10.5%	+/-17.2
Other services, except public administration	43	+/-68	10.0%	+/-14.7
Public administration	0	+/-11	0.0%	+/-6.7
CLASS OF WORKER				
Civilian employed population 16 years and over	430	+/-291	430	(X)
Private wage and salary workers	346	+/-266	80.5%	+/-28.9
Government workers	0	+/-11	0.0%	+/-6.7
Self-employed in own not incorporated business workers	84	+/-134	19.5%	+/-28.9
Unpaid family workers	0	+/-11	0.0%	+/-6.7
INCOME AND BENEFITS (IN 2016 INFLATION-ADJUSTED DOLLARS)				
Total households	373	+/-146	373	(X)
Less than $10,000	14	+/-23	3.8%	+/-5.9
$10,000 to $14,999	82	+/-95	22.0%	+/-21.6
$15,000 to $24,999	39	+/-63	10.5%	+/-17.1
$25,000 to $34,999	0	+/-11	0.0%	+/-7.7
$35,000 to $49,999	56	+/-46	15.0%	+/-13.0
$50,000 to $74,999	29	+/-31	7.8%	+/-8.8
$75,000 to $99,999	45	+/-42	12.1%	+/-11.0
$100,000 to $149,999	44	+/-71	11.8%	+/-17.8
$150,000 to $199,999	15	+/-24	4.0%	+/-6.5
$200,000 or more	49	+/-78	13.1%	+/-20.4
Median household income (dollars)	-	**	(X)	(X)
Mean household income (dollars)	81,820	+/-53,024	(X)	(X)
With earnings	232	+/-127	62.2%	+/-20.4
Mean earnings (dollars)	51,121	+/-24,836	(X)	(X)
With Social Security	225	+/-111	60.3%	+/-21.1
Mean Social Security income (dollars)	15,148	+/-4,316	(X)	(X)
With retirement income	78	+/-73	20.9%	+/-19.7
Mean retirement income (dollars)	10,172	+/-5,246	(X)	(X)

Subject	ZCTA5 83803			
	Estimate	Margin of Error	Percent	Percent Margin of Error
With Supplemental Security Income	0	+/-11	0.0%	+/-7.7
Mean Supplemental Security Income (dollars)	-	**	(X)	(X)
With cash public assistance income	14	+/-23	3.8%	+/-5.9
Mean cash public assistance income (dollars)	N	N	N	N
With Food Stamp/SNAP benefits in the past 12 months	96	+/-97	25.7%	+/-21.5
Families	184	+/-110	184	(X)
Less than $10,000	57	+/-72	31.0%	+/-32.4
$10,000 to $14,999	39	+/-65	21.2%	+/-29.9
$15,000 to $24,999	0	+/-11	0.0%	+/-15.0
$25,000 to $34,999	0	+/-11	0.0%	+/-15.0
$35,000 to $49,999	28	+/-32	15.2%	+/-19.5
$50,000 to $74,999	0	+/-11	0.0%	+/-15.0
$75,000 to $99,999	45	+/-42	24.5%	+/-21.8
$100,000 to $149,999	0	+/-11	0.0%	+/-15.0
$150,000 to $199,999	15	+/-24	8.2%	+/-13.2
$200,000 or more	0	+/-11	0.0%	+/-15.0
Median family income (dollars)	-	**	(X)	(X)
Mean family income (dollars)	45,890	+/-28,324	(X)	(X)
Per capita income (dollars)	37,090	+/-29,987	(X)	(X)
Nonfamily households	189	+/-106	189	(X)
Median nonfamily income (dollars)	-	**	(X)	(X)
Mean nonfamily income (dollars)	114,965	+/-94,525	(X)	(X)
Median earnings for workers (dollars)	19,439	+/-15,710	(X)	(X)
Median earnings for male full-time, year-round workers (dollars)	50,199	+/-39,703	(X)	(X)
Median earnings for female full-time, year-round workers (dollars)	-	**	(X)	(X)
HEALTH INSURANCE COVERAGE				
Civilian noninstitutionalized population	838	+/-440	838	(X)
With health insurance coverage	674	+/-321	80.4%	+/-16.3
With private health insurance	530	+/-286	63.2%	+/-28.2
With public coverage	357	+/-198	42.6%	+/-13.6
No health insurance coverage	164	+/-186	19.6%	+/-16.3
Civilian noninstitutionalized population under 18 years	147	+/-150	147	(X)
No health insurance coverage	0	+/-11	0.0%	+/-18.4
Civilian noninstitutionalized population 18 to 64 years	495	+/-295	495	(X)
In labor force:	419	+/-291	419	(X)
Employed:	339	+/-228	339	(X)
With health insurance coverage	255	+/-195	75.2%	+/-34.8
With private health insurance	241	+/-194	71.1%	+/-34.5
With public coverage	14	+/-23	4.1%	+/-7.3
No health insurance coverage	84	+/-134	24.8%	+/-34.8
Unemployed:	80	+/-129	80	(X)
With health insurance coverage	0	+/-11	0.0%	+/-30.3
With private health insurance	0	+/-11	0.0%	+/-30.3
With public coverage	0	+/-11	0.0%	+/-30.3
No health insurance coverage	80	+/-129	100.0%	+/-30.3
Not in labor force:	76	+/-91	76	(X)
With health insurance coverage	76	+/-91	100.0%	+/-31.4
With private health insurance	76	+/-91	100.0%	+/-31.4

Subject	ZCTA5 83803			
	Estimate	Margin of Error	Percent	Percent Margin of Error
With public coverage	0	+/-11	0.0%	+/-31.4
No health insurance coverage	0	+/-11	0.0%	+/-31.4
PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL				
All families	(X)	(X)	52.2%	+/-32.6
With related children of the householder under 18 years	(X)	(X)	100.0%	+/-26.3
With related children of the householder under 5 years only	(X)	(X)	100.0%	+/-45.6
Married couple families	(X)	(X)	30.7%	+/-39.4
With related children of the householder under 18 years	(X)	(X)	100.0%	+/-45.6
With related children of the householder under 5 years only	(X)	(X)	100.0%	+/-45.6
Families with female householder, no husband present	(X)	(X)	100.0%	+/-37.7
With related children of the householder under 18 years	(X)	(X)	100.0%	+/-37.7
With related children of the householder under 5 years only	(X)	(X)	-	**
All people	(X)	(X)	43.4%	+/-30.8
Under 18 years	(X)	(X)	100.0%	+/-18.4
Related children of the householder under 18 years	(X)	(X)	100.0%	+/-18.4
Related children of the householder under 5 years	(X)	(X)	100.0%	+/-46.8
Related children of the householder 5 to 17 years	(X)	(X)	100.0%	+/-23.6
18 years and over	(X)	(X)	31.4%	+/-27.7
18 to 64 years	(X)	(X)	43.8%	+/-34.5
65 years and over	(X)	(X)	0.0%	+/-14.2
People in families	(X)	(X)	64.5%	+/-32.1
Unrelated individuals 15 years and over	(X)	(X)	12.2%	+/-20.9

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

Employment and unemployment estimates may vary from the official labor force data released by the Bureau of Labor Statistics because of differences in survey design and data collection. For guidance on differences in employment and unemployment estimates from different sources go to Labor Force Guidance.

Workers include members of the Armed Forces and civilians who were at work last week.

Occupation codes are 4-digit codes and are based on Standard Occupational Classification 2010.

Industry codes are 4-digit codes and are based on the North American Industry Classification System (NAICS). The Census industry codes for 2013 and later years are based on the 2012 revision of the NAICS. To allow for the creation of 2012-2016 tables, industry data in the multiyear files (2012-2016) were recoded to 2013 Census industry codes. We recommend using caution when comparing data coded using 2013 Census industry codes with data coded using Census industry codes prior to 2013. For more information on the Census industry code changes, please visit our website at https://www.census.gov/people/io/methodology/.

Logical coverage edits applying a rules-based assignment of Medicaid, Medicare and military health coverage were added as of 2009 -- please see https://www.census.gov/library/working-papers/2010/demo/coverage_edits_final.html for more details. The 2008 data table in American FactFinder does not incorporate these edits. Therefore, the estimates that appear in these tables are not comparable to the estimates in the 2009 and later tables. Select geographies of 2008 data comparable to the 2009 and later tables are available at https://www.census.gov/data/tables/time-series/acs/1-year-re-run-health-insurance.html. The health insurance coverage category names were modified in 2010. See https://www.census.gov/topics/health/health-insurance/about/glossary.html#par_textimage_18 for a list of the insurance type definitions.

While the 2012-2016 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Explanation of Symbols:

1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.

DP04

SELECTED HOUSING CHARACTERISTICS

2012-2016 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Tell us what you think. Provide feedback to help make American Community Survey data more useful for you.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

A processing error was found in the Year Structure Built estimates since data year 2008. For more information, please see the errata note #110.

Subject	ZCTA5 83803			
	Estimate	Margin of Error	Percent	Percent Margin of Error
HOUSING OCCUPANCY				
Total housing units	846	+/-189	846	(X)
Occupied housing units	373	+/-146	44.1%	+/-14.5
Vacant housing units	473	+/-163	55.9%	+/-14.5
Homeowner vacancy rate	15.3	+/-21.6	(X)	(X)
Rental vacancy rate	6.7	+/-12.8	(X)	(X)
UNITS IN STRUCTURE				
Total housing units	846	+/-189	846	(X)
1-unit, detached	575	+/-163	68.0%	+/-14.8
1-unit, attached	39	+/-65	4.6%	+/-7.5
2 units	93	+/-104	11.0%	+/-11.8
3 or 4 units	0	+/-11	0.0%	+/-3.5
5 to 9 units	0	+/-11	0.0%	+/-3.5
10 to 19 units	0	+/-11	0.0%	+/-3.5
20 or more units	0	+/-11	0.0%	+/-3.5
Mobile home	139	+/-91	16.4%	+/-9.9
Boat, RV, van, etc.	0	+/-11	0.0%	+/-3.5
YEAR STRUCTURE BUILT				
Total housing units	846	+/-189	846	(X)
Built 2014 or later	0	+/-11	0.0%	+/-3.5
Built 2010 to 2013	0	+/-11	0.0%	+/-3.5
Built 2000 to 2009	150	+/-93	17.7%	+/-10.5
Built 1990 to 1999	33	+/-32	3.9%	+/-4.0
Built 1980 to 1989	128	+/-96	15.1%	+/-10.4
Built 1970 to 1979	150	+/-105	17.7%	+/-11.9
Built 1960 to 1969	171	+/-114	20.2%	+/-12.2

Subject	ZCTA5 83803			
	Estimate	Margin of Error	Percent	Percent Margin of Error
Built 1950 to 1959	97	+/-89	11.5%	+/-10.0
Built 1940 to 1949	65	+/-53	7.7%	+/-6.3
Built 1939 or earlier	52	+/-43	6.1%	+/-5.1
ROOMS				
Total housing units	846	+/-189	846	(X)
1 room	10	+/-15	1.2%	+/-1.8
2 rooms	96	+/-80	11.3%	+/-9.2
3 rooms	100	+/-93	11.8%	+/-10.4
4 rooms	250	+/-133	29.6%	+/-13.5
5 rooms	121	+/-74	14.3%	+/-8.9
6 rooms	113	+/-96	13.4%	+/-10.6
7 rooms	51	+/-42	6.0%	+/-5.2
8 rooms	68	+/-55	8.0%	+/-6.6
9 rooms or more	37	+/-60	4.4%	+/-7.2
Median rooms	4.4	+/-0.5	(X)	(X)
BEDROOMS				
Total housing units	846	+/-189	846	(X)
No bedroom	10	+/-15	1.2%	+/-1.8
1 bedroom	258	+/-123	30.5%	+/-12.4
2 bedrooms	275	+/-141	32.5%	+/-14.2
3 bedrooms	266	+/-98	31.4%	+/-12.2
4 bedrooms	37	+/-61	4.4%	+/-7.0
5 or more bedrooms	0	+/-11	0.0%	+/-3.5
HOUSING TENURE				
Occupied housing units	373	+/-146	373	(X)
Owner-occupied	233	+/-103	62.5%	+/-24.0
Renter-occupied	140	+/-117	37.5%	+/-24.0
Average household size of owner-occupied unit	1.39	+/-0.22	(X)	(X)
Average household size of renter-occupied unit	3.68	+/-0.33	(X)	(X)
YEAR HOUSEHOLDER MOVED INTO UNIT				
Occupied housing units	373	+/-146	373	(X)
Moved in 2015 or later	54	+/-71	14.5%	+/-17.5
Moved in 2010 to 2014	53	+/-68	14.2%	+/-16.2
Moved in 2000 to 2009	162	+/-114	43.4%	+/-25.4
Moved in 1990 to 1999	14	+/-22	3.8%	+/-6.4
Moved in 1980 to 1989	14	+/-23	3.8%	+/-6.2
Moved in 1979 and earlier	76	+/-77	20.4%	+/-20.7
VEHICLES AVAILABLE				
Occupied housing units	373	+/-146	373	(X)
No vehicles available	0	+/-11	0.0%	+/-7.7
1 vehicle available	119	+/-86	31.9%	+/-23.4
2 vehicles available	88	+/-88	23.6%	+/-22.2
3 or more vehicles available	166	+/-120	44.5%	+/-23.7
HOUSE HEATING FUEL				
Occupied housing units	373	+/-146	373	(X)
Utility gas	29	+/-31	7.8%	+/-8.4
Bottled, tank, or LP gas	0	+/-11	0.0%	+/-7.7
Electricity	306	+/-132	82.0%	+/-13.4
Fuel oil, kerosene, etc.	0	+/-11	0.0%	+/-7.7
Coal or coke	0	+/-11	0.0%	+/-7.7
Wood	38	+/-42	10.2%	+/-11.0
Solar energy	0	+/-11	0.0%	+/-7.7

Subject	ZCTA5 83803			
	Estimate	Margin of Error	Percent	Percent Margin of Error
Other fuel	0	+/-11	0.0%	+/-7.7
No fuel used	0	+/-11	0.0%	+/-7.7
SELECTED CHARACTERISTICS				
Occupied housing units	373	+/-146	373	(X)
Lacking complete plumbing facilities	0	+/-11	0.0%	+/-7.7
Lacking complete kitchen facilities	0	+/-11	0.0%	+/-7.7
No telephone service available	14	+/-23	3.8%	+/-5.9
OCCUPANTS PER ROOM				
Occupied housing units	373	+/-146	373	(X)
1.00 or less	334	+/-131	89.5%	+/-15.7
1.01 to 1.50	0	+/-11	0.0%	+/-7.7
1.51 or more	39	+/-65	10.5%	+/-15.7
VALUE				
Owner-occupied units	233	+/-103	233	(X)
Less than $50,000	0	+/-11	0.0%	+/-12.1
$50,000 to $99,999	54	+/-68	23.2%	+/-28.7
$100,000 to $149,999	11	+/-17	4.7%	+/-7.7
$150,000 to $199,999	28	+/-32	12.0%	+/-13.5
$200,000 to $299,999	0	+/-11	0.0%	+/-12.1
$300,000 to $499,999	126	+/-92	54.1%	+/-31.1
$500,000 to $999,999	14	+/-22	6.0%	+/-9.4
$1,000,000 or more	0	+/-11	0.0%	+/-12.1
Median (dollars)	326,400	+/-201,428	(X)	(X)
MORTGAGE STATUS				
Owner-occupied units	233	+/-103	233	(X)
Housing units with a mortgage	43	+/-38	18.5%	+/-16.6
Housing units without a mortgage	190	+/-98	81.5%	+/-16.6
SELECTED MONTHLY OWNER COSTS (SMOC)				
Housing units with a mortgage	43	+/-38	43	(X)
Less than $500	29	+/-31	67.4%	+/-45.8
$500 to $999	0	+/-11	0.0%	+/-43.5
$1,000 to $1,499	0	+/-11	0.0%	+/-43.5
$1,500 to $1,999	14	+/-22	32.6%	+/-45.8
$2,000 to $2,499	0	+/-11	0.0%	+/-43.5
$2,500 to $2,999	0	+/-11	0.0%	+/-43.5
$3,000 or more	0	+/-11	0.0%	+/-43.5
Median (dollars)	-	**	(X)	(X)
Housing units without a mortgage	190	+/-98	190	(X)
Less than $250	64	+/-69	33.7%	+/-35.7
$250 to $399	25	+/-29	13.2%	+/-15.8
$400 to $599	87	+/-89	45.8%	+/-38.6
$600 to $799	0	+/-11	0.0%	+/-14.6
$800 to $999	14	+/-22	7.4%	+/-11.7
$1,000 or more	0	+/-11	0.0%	+/-14.6
Median (dollars)	416	+/-241	(X)	(X)
SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME (SMOCAPI)				
Housing units with a mortgage (excluding units where SMOCAPI cannot be computed)	43	+/-38	43	(X)
Less than 20.0 percent	29	+/-31	67.4%	+/-45.8
20.0 to 24.9 percent	0	+/-11	0.0%	+/-43.5
25.0 to 29.9 percent	0	+/-11	0.0%	+/-43.5
30.0 to 34.9 percent	0	+/-11	0.0%	+/-43.5

Subject	ZCTA5 83803			
	Estimate	Margin of Error	Percent	Percent Margin of Error
35.0 percent or more	14	+/-22	32.6%	+/-45.8
Not computed	0	+/-11	(X)	(X)
Housing unit without a mortgage (excluding units where SMOCAPI cannot be computed)	190	+/-98	190	(X)
Less than 10.0 percent	123	+/-94	64.7%	+/-35.8
10.0 to 14.9 percent	14	+/-21	7.4%	+/-11.4
15.0 to 19.9 percent	39	+/-63	20.5%	+/-33.7
20.0 to 24.9 percent	14	+/-22	7.4%	+/-11.7
25.0 to 29.9 percent	0	+/-11	0.0%	+/-14.6
30.0 to 34.9 percent	0	+/-11	0.0%	+/-14.6
35.0 percent or more	0	+/-11	0.0%	+/-14.6
Not computed	0	+/-11	(X)	(X)
GROSS RENT				
Occupied units paying rent	140	+/-117	140	(X)
Less than $500	0	+/-11	0.0%	+/-19.2
$500 to $999	82	+/-95	58.6%	+/-45.4
$1,000 to $1,499	58	+/-74	41.4%	+/-45.4
$1,500 to $1,999	0	+/-11	0.0%	+/-19.2
$2,000 to $2,499	0	+/-11	0.0%	+/-19.2
$2,500 to $2,999	0	+/-11	0.0%	+/-19.2
$3,000 or more	0	+/-11	0.0%	+/-19.2
Median (dollars)	972	+/-319	(X)	(X)
No rent paid	0	+/-11	(X)	(X)
GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME (GRAPI)				
Occupied units paying rent (excluding units where GRAPI cannot be computed)	140	+/-117	140	(X)
Less than 15.0 percent	44	+/-71	31.4%	+/-43.7
15.0 to 19.9 percent	0	+/-11	0.0%	+/-19.2
20.0 to 24.9 percent	0	+/-11	0.0%	+/-19.2
25.0 to 29.9 percent	0	+/-11	0.0%	+/-19.2
30.0 to 34.9 percent	0	+/-11	0.0%	+/-19.2
35.0 percent or more	96	+/-97	68.6%	+/-43.7
Not computed	0	+/-11	(X)	(X)

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

Households not paying cash rent are excluded from the calculation of median gross rent.

Telephone service data are not available for certain geographic areas due to problems with data collection of this question that occurred in 2015 and 2016. Both ACS 1-year and ACS 5-year files were affected. It may take several years in the ACS 5-year files until the estimates are available for the geographic areas affected.

While the 2012-2016 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census

2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Explanation of Symbols:

1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.

DP-1

Profile of General Population and Housing Characteristics: 2010

2010 Demographic Profile Data

NOTE: For more information on confidentiality protection, nonsampling error, and definitions, see http://www.census.gov/prod/cen2010/doc/dpsf.pdf.

Geography: ZCTA5 83803

Subject	Number	Percent
SEX AND AGE		
Total population	744	100.0
Under 5 years	18	2.4
5 to 9 years	13	1.7
10 to 14 years	18	2.4
15 to 19 years	30	4.0
20 to 24 years	15	2.0
25 to 29 years	21	2.8
30 to 34 years	20	2.7
35 to 39 years	26	3.5
40 to 44 years	30	4.0
45 to 49 years	48	6.5
50 to 54 years	69	9.3
55 to 59 years	104	14.0
60 to 64 years	102	13.7
65 to 69 years	89	12.0
70 to 74 years	50	6.7
75 to 79 years	37	5.0
80 to 84 years	33	4.4
85 years and over	21	2.8
Median age (years)	57.9	(X)
16 years and over	690	92.7
18 years and over	678	91.1
21 years and over	660	88.7
62 years and over	292	39.2
65 years and over	230	30.9
Male population	385	51.7
Under 5 years	10	1.3
5 to 9 years	8	1.1
10 to 14 years	11	1.5
15 to 19 years	16	2.2
20 to 24 years	10	1.3
25 to 29 years	8	1.1
30 to 34 years	12	1.6
35 to 39 years	12	1.6
40 to 44 years	17	2.3
45 to 49 years	23	3.1
50 to 54 years	38	5.1
55 to 59 years	47	6.3
60 to 64 years	45	6.0

Subject	Number	Percent
65 to 69 years	53	7.1
70 to 74 years	28	3.8
75 to 79 years	17	2.3
80 to 84 years	20	2.7
85 years and over	10	1.3
Median age (years)	58.1	(X)
16 years and over	355	47.7
18 years and over	349	46.9
21 years and over	335	45.0
62 years and over	154	20.7
65 years and over	128	17.2
Female population	359	48.3
Under 5 years	8	1.1
5 to 9 years	5	0.7
10 to 14 years	7	0.9
15 to 19 years	14	1.9
20 to 24 years	5	0.7
25 to 29 years	13	1.7
30 to 34 years	8	1.1
35 to 39 years	14	1.9
40 to 44 years	13	1.7
45 to 49 years	25	3.4
50 to 54 years	31	4.2
55 to 59 years	57	7.7
60 to 64 years	57	7.7
65 to 69 years	36	4.8
70 to 74 years	22	3.0
75 to 79 years	20	2.7
80 to 84 years	13	1.7
85 years and over	11	1.5
Median age (years)	57.7	(X)
16 years and over	335	45.0
18 years and over	329	44.2
21 years and over	325	43.7
62 years and over	138	18.5
65 years and over	102	13.7
RACE		
Total population	744	100.0
One Race	741	99.6
White	734	98.7
Black or African American	0	0.0
American Indian and Alaska Native	5	0.7
Asian	1	0.1
Asian Indian	0	0.0
Chinese	0	0.0
Filipino	1	0.1
Japanese	0	0.0
Korean	0	0.0
Vietnamese	0	0.0
Other Asian [1]	0	0.0
Native Hawaiian and Other Pacific Islander	0	0.0
Native Hawaiian	0	0.0
Guamanian or Chamorro	0	0.0
Samoan	0	0.0

Subject	Number	Percent
Other Pacific Islander [2]	0	0.0
Some Other Race	1	0.1
Two or More Races	3	0.4
White; American Indian and Alaska Native [3]	2	0.3
White; Asian [3]	1	0.1
White; Black or African American [3]	0	0.0
White; Some Other Race [3]	0	0.0
Race alone or in combination with one or more other races: [4]		
White	737	99.1
Black or African American	0	0.0
American Indian and Alaska Native	7	0.9
Asian	2	0.3
Native Hawaiian and Other Pacific Islander	0	0.0
Some Other Race	1	0.1
HISPANIC OR LATINO		
Total population	744	100.0
Hispanic or Latino (of any race)	13	1.7
Mexican	8	1.1
Puerto Rican	2	0.3
Cuban	0	0.0
Other Hispanic or Latino [5]	3	0.4
Not Hispanic or Latino	731	98.3
HISPANIC OR LATINO AND RACE		
Total population	744	100.0
Hispanic or Latino	13	1.7
White alone	13	1.7
Black or African American alone	0	0.0
American Indian and Alaska Native alone	0	0.0
Asian alone	0	0.0
Native Hawaiian and Other Pacific Islander alone	0	0.0
Some Other Race alone	0	0.0
Two or More Races	0	0.0
Not Hispanic or Latino	731	98.3
White alone	721	96.9
Black or African American alone	0	0.0
American Indian and Alaska Native alone	5	0.7
Asian alone	1	0.1
Native Hawaiian and Other Pacific Islander alone	0	0.0
Some Other Race alone	1	0.1
Two or More Races	3	0.4
RELATIONSHIP		
Total population	744	100.0
In households	744	100.0
Householder	389	52.3
Spouse [6]	208	28.0
Child	88	11.8
Own child under 18 years	54	7.3
Other relatives	28	3.8
Under 18 years	12	1.6
65 years and over	6	0.8
Nonrelatives	31	4.2
Under 18 years	0	0.0
65 years and over	8	1.1
Unmarried partner	16	2.2
In group quarters	0	0.0

Subject	Number	Percent
Institutionalized population	0	0.0
Male	0	0.0
Female	0	0.0
Noninstitutionalized population	0	0.0
Male	0	0.0
Female	0	0.0
HOUSEHOLDS BY TYPE		
Total households	389	100.0
Family households (families) [7]	238	61.2
With own children under 18 years	32	8.2
Husband-wife family	208	53.5
With own children under 18 years	20	5.1
Male householder, no wife present	13	3.3
With own children under 18 years	4	1.0
Female householder, no husband present	17	4.4
With own children under 18 years	8	2.1
Nonfamily households [7]	151	38.8
Householder living alone	134	34.4
Male	68	17.5
65 years and over	26	6.7
Female	66	17.0
65 years and over	27	6.9
Households with individuals under 18 years	41	10.5
Households with individuals 65 years and over	168	43.2
Average household size	1.91	(X)
Average family size [7]	2.36	(X)
HOUSING OCCUPANCY		
Total housing units	860	100.0
Occupied housing units	389	45.2
Vacant housing units	471	54.8
For rent	8	0.9
Rented, not occupied	2	0.2
For sale only	11	1.3
Sold, not occupied	3	0.3
For seasonal, recreational, or occasional use	427	49.7
All other vacants	20	2.3
Homeowner vacancy rate (percent) [8]	3.4	(X)
Rental vacancy rate (percent) [9]	8.8	(X)
HOUSING TENURE		
Occupied housing units	389	100.0
Owner-occupied housing units	308	79.2
Population in owner-occupied housing units	589	(X)
Average household size of owner-occupied units	1.91	(X)
Renter-occupied housing units	81	20.8
Population in renter-occupied housing units	155	(X)
Average household size of renter-occupied units	1.91	(X)

X Not applicable.

[1] Other Asian alone, or two or more Asian categories.

[2] Other Pacific Islander alone, or two or more Native Hawaiian and Other Pacific Islander categories.

[3] One of the four most commonly reported multiple-race combinations nationwide in Census 2000.

[4] In combination with one or more of the other races listed. The six numbers may add to more than the total population, and the six

percentages may add to more than 100 percent because individuals may report more than one race.

[5] This category is composed of people whose origins are from the Dominican Republic, Spain, and Spanish-speaking Central or South American countries. It also includes general origin responses such as "Latino" or "Hispanic."

[6] "Spouse" represents spouse of the householder. It does not reflect all spouses in a household. Responses of "same-sex spouse" were edited during processing to "unmarried partner."

[7] "Family households" consist of a householder and one or more other people related to the householder by birth, marriage, or adoption. They do not include same-sex married couples even if the marriage was performed in a state issuing marriage certificates for same-sex couples. Same-sex couple households are included in the family households category if there is at least one additional person related to the householder by birth or adoption. Same-sex couple households with no relatives of the householder present are tabulated in nonfamily households. "Nonfamily households" consist of people living alone and households which do not have any members related to the householder.

[8] The homeowner vacancy rate is the proportion of the homeowner inventory that is vacant "for sale." It is computed by dividing the total number of vacant units "for sale only" by the sum of owner-occupied units, vacant units that are "for sale only," and vacant units that have been sold but not yet occupied; and then multiplying by 100.

[9] The rental vacancy rate is the proportion of the rental inventory that is vacant "for rent." It is computed by dividing the total number of vacant units "for rent" by the sum of the renter-occupied units, vacant units that are "for rent," and vacant units that have been rented but not yet occupied; and then multiplying by 100.

Source: U.S. Census Bureau, 2010 Census.

DP03

SELECTED ECONOMIC CHARACTERISTICS

2012-2016 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Tell us what you think. Provide feedback to help make American Community Survey data more useful for you.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

Subject	Kootenai County, Idaho			
	Estimate	Margin of Error	Percent	Percent Margin of Error
EMPLOYMENT STATUS				
Population 16 years and over	116,746	+/-333	116,746	(X)
In labor force	71,357	+/-1,027	61.1%	+/-0.9
Civilian labor force	71,217	+/-1,040	61.0%	+/-0.9
Employed	66,141	+/-1,009	56.7%	+/-0.9
Unemployed	5,076	+/-696	4.3%	+/-0.6
Armed Forces	140	+/-143	0.1%	+/-0.1
Not in labor force	45,389	+/-1,057	38.9%	+/-0.9
Civilian labor force	71,217	+/-1,040	71,217	(X)
Unemployment Rate	(X)	(X)	7.1%	+/-0.9
Females 16 years and over	59,670	+/-231	59,670	(X)
In labor force	33,141	+/-816	55.5%	+/-1.4
Civilian labor force	33,132	+/-817	55.5%	+/-1.4
Employed	30,894	+/-803	51.8%	+/-1.3
Own children of the householder under 6 years	10,067	+/-357	10,067	(X)
All parents in family in labor force	5,717	+/-556	56.8%	+/-5.4
Own children of the householder 6 to 17 years	23,431	+/-463	23,431	(X)
All parents in family in labor force	16,191	+/-869	69.1%	+/-3.6
COMMUTING TO WORK				
Workers 16 years and over	65,013	+/-1,043	65,013	(X)
Car, truck, or van -- drove alone	52,952	+/-1,266	81.4%	+/-1.2
Car, truck, or van -- carpooled	5,481	+/-596	8.4%	+/-0.9
Public transportation (excluding taxicab)	212	+/-82	0.3%	+/-0.1
Walked	1,366	+/-294	2.1%	+/-0.5
Other means	1,151	+/-245	1.8%	+/-0.4
Worked at home	3,851	+/-450	5.9%	+/-0.7

Subject	Kootenai County, Idaho			
	Estimate	Margin of Error	Percent	Percent Margin of Error
Mean travel time to work (minutes)	21.2	+/-0.6	(X)	(X)
OCCUPATION				
Civilian employed population 16 years and over	66,141	+/-1,009	66,141	(X)
Management, business, science, and arts occupations	20,612	+/-1,110	31.2%	+/-1.6
Service occupations	12,859	+/-879	19.4%	+/-1.3
Sales and office occupations	17,920	+/-1,117	27.1%	+/-1.6
Natural resources, construction, and maintenance occupations	7,470	+/-698	11.3%	+/-1.0
Production, transportation, and material moving occupations	7,280	+/-711	11.0%	+/-1.1
INDUSTRY				
Civilian employed population 16 years and over	66,141	+/-1,009	66,141	(X)
Agriculture, forestry, fishing and hunting, and mining	1,672	+/-381	2.5%	+/-0.6
Construction	5,703	+/-630	8.6%	+/-1.0
Manufacturing	5,194	+/-637	7.9%	+/-1.0
Wholesale trade	1,720	+/-410	2.6%	+/-0.6
Retail trade	9,287	+/-845	14.0%	+/-1.2
Transportation and warehousing, and utilities	2,688	+/-493	4.1%	+/-0.8
Information	1,434	+/-346	2.2%	+/-0.5
Finance and insurance, and real estate and rental and leasing	3,998	+/-426	6.0%	+/-0.6
Professional, scientific, and management, and administrative and waste management services	7,337	+/-760	11.1%	+/-1.2
Educational services, and health care and social assistance	13,690	+/-850	20.7%	+/-1.2
Arts, entertainment, and recreation, and accommodation and food services	7,513	+/-662	11.4%	+/-1.0
Other services, except public administration	3,303	+/-484	5.0%	+/-0.7
Public administration	2,602	+/-409	3.9%	+/-0.6
CLASS OF WORKER				
Civilian employed population 16 years and over	66,141	+/-1,009	66,141	(X)
Private wage and salary workers	52,623	+/-1,488	79.6%	+/-1.6
Government workers	8,023	+/-784	12.1%	+/-1.2
Self-employed in own not incorporated business workers	5,340	+/-698	8.1%	+/-1.1
Unpaid family workers	155	+/-99	0.2%	+/-0.1
INCOME AND BENEFITS (IN 2016 INFLATION-ADJUSTED DOLLARS)				
Total households	57,213	+/-608	57,213	(X)
Less than $10,000	3,037	+/-446	5.3%	+/-0.8
$10,000 to $14,999	2,891	+/-404	5.1%	+/-0.7
$15,000 to $24,999	6,056	+/-597	10.6%	+/-1.0
$25,000 to $34,999	6,486	+/-576	11.3%	+/-1.0
$35,000 to $49,999	9,501	+/-722	16.6%	+/-1.2
$50,000 to $74,999	12,048	+/-814	21.1%	+/-1.4
$75,000 to $99,999	6,677	+/-636	11.7%	+/-1.1
$100,000 to $149,999	6,849	+/-577	12.0%	+/-1.0
$150,000 to $199,999	1,809	+/-363	3.2%	+/-0.6
$200,000 or more	1,859	+/-312	3.2%	+/-0.5
Median household income (dollars)	50,924	+/-1,311	(X)	(X)
Mean household income (dollars)	66,899	+/-2,159	(X)	(X)
With earnings	42,775	+/-766	74.8%	+/-1.0
Mean earnings (dollars)	63,290	+/-2,128	(X)	(X)
With Social Security	19,877	+/-560	34.7%	+/-1.0
Mean Social Security income (dollars)	19,236	+/-460	(X)	(X)
With retirement income	11,506	+/-671	20.1%	+/-1.2
Mean retirement income (dollars)	27,600	+/-3,251	(X)	(X)

Subject	Kootenai County, Idaho			
	Estimate	Margin of Error	Percent	Percent Margin of Error
With Supplemental Security Income	2,432	+/-357	4.3%	+/-0.6
Mean Supplemental Security Income (dollars)	10,841	+/-1,190	(X)	(X)
With cash public assistance income	1,765	+/-308	3.1%	+/-0.5
Mean cash public assistance income (dollars)	2,300	+/-536	(X)	(X)
With Food Stamp/SNAP benefits in the past 12 months	6,988	+/-716	12.2%	+/-1.2
Families	39,564	+/-887	39,564	(X)
Less than $10,000	1,457	+/-326	3.7%	+/-0.8
$10,000 to $14,999	1,067	+/-271	2.7%	+/-0.7
$15,000 to $24,999	2,770	+/-455	7.0%	+/-1.1
$25,000 to $34,999	3,898	+/-498	9.9%	+/-1.2
$35,000 to $49,999	6,379	+/-560	16.1%	+/-1.3
$50,000 to $74,999	9,146	+/-659	23.1%	+/-1.6
$75,000 to $99,999	5,676	+/-549	14.3%	+/-1.4
$100,000 to $149,999	6,008	+/-572	15.2%	+/-1.4
$150,000 to $199,999	1,600	+/-335	4.0%	+/-0.9
$200,000 or more	1,563	+/-270	4.0%	+/-0.7
Median family income (dollars)	60,913	+/-1,880	(X)	(X)
Mean family income (dollars)	76,939	+/-2,746	(X)	(X)
Per capita income (dollars)	26,514	+/-797	(X)	(X)
Nonfamily households	17,649	+/-959	17,649	(X)
Median nonfamily income (dollars)	30,179	+/-2,145	(X)	(X)
Mean nonfamily income (dollars)	40,437	+/-2,914	(X)	(X)
Median earnings for workers (dollars)	26,603	+/-994	(X)	(X)
Median earnings for male full-time, year-round workers (dollars)	42,740	+/-2,500	(X)	(X)
Median earnings for female full-time, year-round workers (dollars)	35,603	+/-1,410	(X)	(X)
HEALTH INSURANCE COVERAGE				
Civilian noninstitutionalized population	146,447	+/-240	146,447	(X)
With health insurance coverage	126,912	+/-1,473	86.7%	+/-1.0
With private health insurance	100,030	+/-2,774	68.3%	+/-1.9
With public coverage	48,296	+/-1,528	33.0%	+/-1.0
No health insurance coverage	19,535	+/-1,444	13.3%	+/-1.0
Civilian noninstitutionalized population under 18 years	34,822	+/-39	34,822	(X)
No health insurance coverage	2,426	+/-511	7.0%	+/-1.5
Civilian noninstitutionalized population 18 to 64 years	87,124	+/-209	87,124	(X)
In labor force:	66,733	+/-1,005	66,733	(X)
Employed:	62,285	+/-1,044	62,285	(X)
With health insurance coverage	50,823	+/-1,498	81.6%	+/-1.7
With private health insurance	48,266	+/-1,560	77.5%	+/-1.7
With public coverage	4,119	+/-472	6.6%	+/-0.8
No health insurance coverage	11,462	+/-1,004	18.4%	+/-1.7
Unemployed:	4,448	+/-604	4,448	(X)
With health insurance coverage	2,509	+/-502	56.4%	+/-7.0
With private health insurance	2,053	+/-473	46.2%	+/-6.8
With public coverage	470	+/-139	10.6%	+/-3.2
No health insurance coverage	1,939	+/-367	43.6%	+/-7.0
Not in labor force:	20,391	+/-984	20,391	(X)
With health insurance coverage	16,717	+/-886	82.0%	+/-2.4
With private health insurance	11,851	+/-824	58.1%	+/-3.3

Subject	Kootenai County, Idaho			
	Estimate	Margin of Error	Percent	Percent Margin of Error
With public coverage	6,534	+/-592	32.0%	+/-2.6
No health insurance coverage	3,674	+/-541	18.0%	+/-2.4
PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL				
All families	(X)	(X)	9.5%	+/-1.2
With related children of the householder under 18 years	(X)	(X)	16.0%	+/-2.4
With related children of the householder under 5 years only	(X)	(X)	21.7%	+/-5.5
Married couple families	(X)	(X)	4.8%	+/-0.9
With related children of the householder under 18 years	(X)	(X)	6.2%	+/-1.5
With related children of the householder under 5 years only	(X)	(X)	8.8%	+/-5.0
Families with female householder, no husband present	(X)	(X)	29.9%	+/-5.9
With related children of the householder under 18 years	(X)	(X)	37.6%	+/-7.8
With related children of the householder under 5 years only	(X)	(X)	58.4%	+/-13.3
All people	(X)	(X)	12.6%	+/-1.3
Under 18 years	(X)	(X)	17.4%	+/-3.0
Related children of the householder under 18 years	(X)	(X)	17.1%	+/-3.0
Related children of the householder under 5 years	(X)	(X)	20.8%	+/-4.2
Related children of the householder 5 to 17 years	(X)	(X)	15.9%	+/-3.3
18 years and over	(X)	(X)	11.2%	+/-1.0
18 to 64 years	(X)	(X)	12.4%	+/-1.1
65 years and over	(X)	(X)	6.9%	+/-1.6
People in families	(X)	(X)	9.9%	+/-1.4
Unrelated individuals 15 years and over	(X)	(X)	24.6%	+/-2.1

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

Employment and unemployment estimates may vary from the official labor force data released by the Bureau of Labor Statistics because of differences in survey design and data collection. For guidance on differences in employment and unemployment estimates from different sources go to Labor Force Guidance.

Workers include members of the Armed Forces and civilians who were at work last week.

Occupation codes are 4-digit codes and are based on Standard Occupational Classification 2010.

Industry codes are 4-digit codes and are based on the North American Industry Classification System (NAICS). The Census industry codes for 2013 and later years are based on the 2012 revision of the NAICS. To allow for the creation of 2012-2016 tables, industry data in the multiyear files (2012-2016) were recoded to 2013 Census industry codes. We recommend using caution when comparing data coded using 2013 Census industry codes with data coded using Census industry codes prior to 2013. For more information on the Census industry code changes, please visit our website at https://www.census.gov/people/io/methodology/.

Logical coverage edits applying a rules-based assignment of Medicaid, Medicare and military health coverage were added as of 2009 -- please see https://www.census.gov/library/working-papers/2010/demo/coverage_edits_final.html for more details. The 2008 data table in American FactFinder does not incorporate these edits. Therefore, the estimates that appear in these tables are not comparable to the estimates in the 2009 and later tables. Select geographies of 2008 data comparable to the 2009 and later tables are available at https://www.census.gov/data/tables/time-series/acs/1-year-re-run-health-insurance.html. The health insurance coverage category names were modified in 2010. See https://www.census.gov/topics/health/health-insurance/about/glossary.html#par_textimage_18 for a list of the insurance type definitions.

While the 2012-2016 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Explanation of Symbols:

1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.

DP04

SELECTED HOUSING CHARACTERISTICS

2012-2016 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Tell us what you think. Provide feedback to help make American Community Survey data more useful for you.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

A processing error was found in the Year Structure Built estimates since data year 2008. For more information, please see the errata note #110.

Subject	Kootenai County, Idaho			
	Estimate	Margin of Error	Percent	Percent Margin of Error
HOUSING OCCUPANCY				
Total housing units	66,126	+/-132	66,126	(X)
Occupied housing units	57,213	+/-608	86.5%	+/-0.9
Vacant housing units	8,913	+/-585	13.5%	+/-0.9
Homeowner vacancy rate	2.2	+/-0.6	(X)	(X)
Rental vacancy rate	4.9	+/-1.6	(X)	(X)
UNITS IN STRUCTURE				
Total housing units	66,126	+/-132	66,126	(X)
1-unit, detached	49,098	+/-802	74.2%	+/-1.2
1-unit, attached	1,288	+/-235	1.9%	+/-0.4
2 units	1,802	+/-306	2.7%	+/-0.5
3 or 4 units	2,040	+/-356	3.1%	+/-0.5
5 to 9 units	1,889	+/-406	2.9%	+/-0.6
10 to 19 units	1,678	+/-301	2.5%	+/-0.5
20 or more units	2,650	+/-302	4.0%	+/-0.5
Mobile home	5,618	+/-513	8.5%	+/-0.8
Boat, RV, van, etc.	63	+/-42	0.1%	+/-0.1
YEAR STRUCTURE BUILT				
Total housing units	66,126	+/-132	66,126	(X)
Built 2014 or later	668	+/-313	1.0%	+/-0.5
Built 2010 to 2013	2,370	+/-364	3.6%	+/-0.6
Built 2000 to 2009	17,608	+/-819	26.6%	+/-1.2
Built 1990 to 1999	14,667	+/-735	22.2%	+/-1.1
Built 1980 to 1989	6,960	+/-519	10.5%	+/-0.8
Built 1970 to 1979	11,932	+/-698	18.0%	+/-1.1
Built 1960 to 1969	3,815	+/-419	5.8%	+/-0.6

Subject	Kootenai County, Idaho			
	Estimate	Margin of Error	Percent	Percent Margin of Error
Built 1950 to 1959	2,740	+/-350	4.1%	+/-0.5
Built 1940 to 1949	1,495	+/-265	2.3%	+/-0.4
Built 1939 or earlier	3,871	+/-430	5.9%	+/-0.7
ROOMS				
Total housing units	66,126	+/-132	66,126	(X)
1 room	961	+/-264	1.5%	+/-0.4
2 rooms	1,837	+/-406	2.8%	+/-0.6
3 rooms	5,051	+/-541	7.6%	+/-0.8
4 rooms	10,274	+/-791	15.5%	+/-1.2
5 rooms	12,792	+/-859	19.3%	+/-1.3
6 rooms	10,841	+/-745	16.4%	+/-1.1
7 rooms	8,012	+/-615	12.1%	+/-0.9
8 rooms	6,792	+/-632	10.3%	+/-1.0
9 rooms or more	9,566	+/-658	14.5%	+/-1.0
Median rooms	5.7	+/-0.1	(X)	(X)
BEDROOMS				
Total housing units	66,126	+/-132	66,126	(X)
No bedroom	1,007	+/-268	1.5%	+/-0.4
1 bedroom	4,325	+/-492	6.5%	+/-0.7
2 bedrooms	16,559	+/-926	25.0%	+/-1.4
3 bedrooms	28,043	+/-977	42.4%	+/-1.5
4 bedrooms	11,691	+/-797	17.7%	+/-1.2
5 or more bedrooms	4,501	+/-489	6.8%	+/-0.7
HOUSING TENURE				
Occupied housing units	57,213	+/-608	57,213	(X)
Owner-occupied	39,909	+/-1,012	69.8%	+/-1.6
Renter-occupied	17,304	+/-921	30.2%	+/-1.6
Average household size of owner-occupied unit	2.50	+/-0.04	(X)	(X)
Average household size of renter-occupied unit	2.66	+/-0.10	(X)	(X)
YEAR HOUSEHOLDER MOVED INTO UNIT				
Occupied housing units	57,213	+/-608	57,213	(X)
Moved in 2015 or later	4,210	+/-615	7.4%	+/-1.1
Moved in 2010 to 2014	20,059	+/-976	35.1%	+/-1.7
Moved in 2000 to 2009	20,359	+/-1,018	35.6%	+/-1.7
Moved in 1990 to 1999	7,977	+/-594	13.9%	+/-1.0
Moved in 1980 to 1989	2,578	+/-307	4.5%	+/-0.5
Moved in 1979 and earlier	2,030	+/-294	3.5%	+/-0.5
VEHICLES AVAILABLE				
Occupied housing units	57,213	+/-608	57,213	(X)
No vehicles available	2,200	+/-393	3.8%	+/-0.7
1 vehicle available	15,112	+/-911	26.4%	+/-1.5
2 vehicles available	22,981	+/-915	40.2%	+/-1.6
3 or more vehicles available	16,920	+/-811	29.6%	+/-1.4
HOUSE HEATING FUEL				
Occupied housing units	57,213	+/-608	57,213	(X)
Utility gas	28,939	+/-907	50.6%	+/-1.5
Bottled, tank, or LP gas	1,672	+/-293	2.9%	+/-0.5
Electricity	21,455	+/-928	37.5%	+/-1.5
Fuel oil, kerosene, etc.	376	+/-170	0.7%	+/-0.3
Coal or coke	0	+/-27	0.0%	+/-0.1
Wood	4,240	+/-395	7.4%	+/-0.7
Solar energy	30	+/-31	0.1%	+/-0.1

Subject	Kootenai County, Idaho			
	Estimate	Margin of Error	Percent	Percent Margin of Error
Other fuel	385	+/-147	0.7%	+/-0.3
No fuel used	116	+/-59	0.2%	+/-0.1
SELECTED CHARACTERISTICS				
Occupied housing units	57,213	+/-608	57,213	(X)
Lacking complete plumbing facilities	426	+/-174	0.7%	+/-0.3
Lacking complete kitchen facilities	781	+/-221	1.4%	+/-0.4
No telephone service available	1,824	+/-348	3.2%	+/-0.6
OCCUPANTS PER ROOM				
Occupied housing units	57,213	+/-608	57,213	(X)
1.00 or less	55,956	+/-649	97.8%	+/-0.4
1.01 to 1.50	1,013	+/-242	1.8%	+/-0.4
1.51 or more	244	+/-114	0.4%	+/-0.2
VALUE				
Owner-occupied units	39,909	+/-1,012	39,909	(X)
Less than $50,000	3,156	+/-416	7.9%	+/-1.1
$50,000 to $99,999	2,051	+/-304	5.1%	+/-0.8
$100,000 to $149,999	6,205	+/-639	15.5%	+/-1.5
$150,000 to $199,999	9,588	+/-826	24.0%	+/-1.9
$200,000 to $299,999	8,721	+/-622	21.9%	+/-1.5
$300,000 to $499,999	6,874	+/-563	17.2%	+/-1.4
$500,000 to $999,999	2,904	+/-294	7.3%	+/-0.7
$1,000,000 or more	410	+/-116	1.0%	+/-0.3
Median (dollars)	193,300	+/-4,055	(X)	(X)
MORTGAGE STATUS				
Owner-occupied units	39,909	+/-1,012	39,909	(X)
Housing units with a mortgage	27,135	+/-1,061	68.0%	+/-1.7
Housing units without a mortgage	12,774	+/-697	32.0%	+/-1.7
SELECTED MONTHLY OWNER COSTS (SMOC)				
Housing units with a mortgage	27,135	+/-1,061	27,135	(X)
Less than $500	677	+/-193	2.5%	+/-0.7
$500 to $999	7,278	+/-640	26.8%	+/-2.2
$1,000 to $1,499	10,659	+/-752	39.3%	+/-2.0
$1,500 to $1,999	4,736	+/-518	17.5%	+/-1.7
$2,000 to $2,499	2,047	+/-308	7.5%	+/-1.1
$2,500 to $2,999	709	+/-176	2.6%	+/-0.7
$3,000 or more	1,029	+/-223	3.8%	+/-0.8
Median (dollars)	1,227	+/-24	(X)	(X)
Housing units without a mortgage	12,774	+/-697	12,774	(X)
Less than $250	2,823	+/-383	22.1%	+/-2.5
$250 to $399	4,654	+/-466	36.4%	+/-3.3
$400 to $599	3,593	+/-444	28.1%	+/-3.0
$600 to $799	995	+/-180	7.8%	+/-1.4
$800 to $999	360	+/-94	2.8%	+/-0.7
$1,000 or more	349	+/-113	2.7%	+/-0.9
Median (dollars)	363	+/-11	(X)	(X)
SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME (SMOCAPI)				
Housing units with a mortgage (excluding units where SMOCAPI cannot be computed)	26,937	+/-1,057	26,937	(X)
Less than 20.0 percent	10,384	+/-749	38.5%	+/-2.3
20.0 to 24.9 percent	4,891	+/-579	18.2%	+/-2.0
25.0 to 29.9 percent	3,300	+/-476	12.3%	+/-1.6
30.0 to 34.9 percent	2,277	+/-421	8.5%	+/-1.6

Subject	Kootenai County, Idaho			
	Estimate	Margin of Error	Percent	Percent Margin of Error
35.0 percent or more	6,085	+/-555	22.6%	+/-1.9
Not computed	198	+/-125	(X)	(X)
Housing unit without a mortgage (excluding units where SMOCAPI cannot be computed)	12,658	+/-693	12,658	(X)
Less than 10.0 percent	6,336	+/-590	50.1%	+/-3.3
10.0 to 14.9 percent	2,370	+/-331	18.7%	+/-2.6
15.0 to 19.9 percent	1,340	+/-226	10.6%	+/-1.7
20.0 to 24.9 percent	925	+/-230	7.3%	+/-1.7
25.0 to 29.9 percent	339	+/-96	2.7%	+/-0.8
30.0 to 34.9 percent	301	+/-146	2.4%	+/-1.2
35.0 percent or more	1,047	+/-281	8.3%	+/-2.1
Not computed	116	+/-62	(X)	(X)
GROSS RENT				
Occupied units paying rent	16,521	+/-898	16,521	(X)
Less than $500	1,622	+/-292	9.8%	+/-1.8
$500 to $999	8,954	+/-689	54.2%	+/-3.1
$1,000 to $1,499	4,809	+/-634	29.1%	+/-3.2
$1,500 to $1,999	804	+/-207	4.9%	+/-1.3
$2,000 to $2,499	177	+/-107	1.1%	+/-0.6
$2,500 to $2,999	29	+/-34	0.2%	+/-0.2
$3,000 or more	126	+/-113	0.8%	+/-0.7
Median (dollars)	878	+/-22	(X)	(X)
No rent paid	783	+/-254	(X)	(X)
GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME (GRAPI)				
Occupied units paying rent (excluding units where GRAPI cannot be computed)	16,241	+/-854	16,241	(X)
Less than 15.0 percent	1,931	+/-408	11.9%	+/-2.5
15.0 to 19.9 percent	2,022	+/-355	12.4%	+/-2.1
20.0 to 24.9 percent	2,387	+/-515	14.7%	+/-3.0
25.0 to 29.9 percent	2,021	+/-468	12.4%	+/-2.9
30.0 to 34.9 percent	1,311	+/-252	8.1%	+/-1.5
35.0 percent or more	6,569	+/-723	40.4%	+/-3.8
Not computed	1,063	+/-282	(X)	(X)

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

Households not paying cash rent are excluded from the calculation of median gross rent.

Telephone service data are not available for certain geographic areas due to problems with data collection of this question that occurred in 2015 and 2016. Both ACS 1-year and ACS 5-year files were affected. It may take several years in the ACS 5-year files until the estimates are available for the geographic areas affected.

While the 2012-2016 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census

2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Explanation of Symbols:

1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.

DP-1

Profile of General Population and Housing Characteristics: 2010

2010 Demographic Profile Data

NOTE: For more information on confidentiality protection, nonsampling error, and definitions, see http://www.census.gov/prod/cen2010/doc/dpsf.pdf.

Geography: Kootenai County, Idaho

Subject	Number	Percent
SEX AND AGE		
Total population	138,494	100.0
Under 5 years	8,963	6.5
5 to 9 years	9,466	6.8
10 to 14 years	9,743	7.0
15 to 19 years	9,915	7.2
20 to 24 years	8,165	5.9
25 to 29 years	8,501	6.1
30 to 34 years	8,241	6.0
35 to 39 years	8,335	6.0
40 to 44 years	8,913	6.4
45 to 49 years	9,775	7.1
50 to 54 years	10,089	7.3
55 to 59 years	9,579	6.9
60 to 64 years	8,731	6.3
65 to 69 years	6,573	4.7
70 to 74 years	4,891	3.5
75 to 79 years	3,562	2.6
80 to 84 years	2,629	1.9
85 years and over	2,423	1.7
Median age (years)	38.9	(X)
16 years and over	108,277	78.2
18 years and over	104,250	75.3
21 years and over	98,585	71.2
62 years and over	25,215	18.2
65 years and over	20,078	14.5
Male population	68,257	49.3
Under 5 years	4,605	3.3
5 to 9 years	4,839	3.5
10 to 14 years	4,978	3.6
15 to 19 years	5,128	3.7
20 to 24 years	4,121	3.0
25 to 29 years	4,189	3.0
30 to 34 years	4,094	3.0
35 to 39 years	4,234	3.1
40 to 44 years	4,411	3.2
45 to 49 years	4,701	3.4
50 to 54 years	4,851	3.5
55 to 59 years	4,586	3.3
60 to 64 years	4,229	3.1

Subject	Number	Percent
65 to 69 years	3,198	2.3
70 to 74 years	2,440	1.8
75 to 79 years	1,688	1.2
80 to 84 years	1,157	0.8
85 years and over	808	0.6
Median age (years)	37.7	(X)
16 years and over	52,782	38.1
18 years and over	50,688	36.6
21 years and over	47,791	34.5
62 years and over	11,789	8.5
65 years and over	9,291	6.7
Female population	70,237	50.7
Under 5 years	4,358	3.1
5 to 9 years	4,627	3.3
10 to 14 years	4,765	3.4
15 to 19 years	4,787	3.5
20 to 24 years	4,044	2.9
25 to 29 years	4,312	3.1
30 to 34 years	4,147	3.0
35 to 39 years	4,101	3.0
40 to 44 years	4,502	3.3
45 to 49 years	5,074	3.7
50 to 54 years	5,238	3.8
55 to 59 years	4,993	3.6
60 to 64 years	4,502	3.3
65 to 69 years	3,375	2.4
70 to 74 years	2,451	1.8
75 to 79 years	1,874	1.4
80 to 84 years	1,472	1.1
85 years and over	1,615	1.2
Median age (years)	40.0	(X)
16 years and over	55,495	40.1
18 years and over	53,562	38.7
21 years and over	50,794	36.7
62 years and over	13,426	9.7
65 years and over	10,787	7.8
RACE		
Total population	138,494	100.0
One Race	135,172	97.6
White	130,844	94.5
Black or African American	416	0.3
American Indian and Alaska Native	1,781	1.3
Asian	961	0.7
Asian Indian	114	0.1
Chinese	173	0.1
Filipino	262	0.2
Japanese	130	0.1
Korean	106	0.1
Vietnamese	73	0.1
Other Asian [1]	103	0.1
Native Hawaiian and Other Pacific Islander	129	0.1
Native Hawaiian	61	0.0
Guamanian or Chamorro	19	0.0
Samoan	25	0.0

Subject	Number	Percent
Other Pacific Islander [2]	24	0.0
Some Other Race	1,041	0.8
Two or More Races	3,322	2.4
White; American Indian and Alaska Native [3]	1,456	1.1
White; Asian [3]	636	0.5
White; Black or African American [3]	401	0.3
White; Some Other Race [3]	324	0.2
Race alone or in combination with one or more other races: [4]		
White	134,013	96.8
Black or African American	950	0.7
American Indian and Alaska Native	3,449	2.5
Asian	1,796	1.3
Native Hawaiian and Other Pacific Islander	371	0.3
Some Other Race	1,492	1.1
HISPANIC OR LATINO		
Total population	138,494	100.0
Hispanic or Latino (of any race)	5,268	3.8
Mexican	3,529	2.5
Puerto Rican	319	0.2
Cuban	69	0.0
Other Hispanic or Latino [5]	1,351	1.0
Not Hispanic or Latino	133,226	96.2
HISPANIC OR LATINO AND RACE		
Total population	138,494	100.0
Hispanic or Latino	5,268	3.8
White alone	3,390	2.4
Black or African American alone	35	0.0
American Indian and Alaska Native alone	211	0.2
Asian alone	36	0.0
Native Hawaiian and Other Pacific Islander alone	12	0.0
Some Other Race alone	924	0.7
Two or More Races	660	0.5
Not Hispanic or Latino	133,226	96.2
White alone	127,454	92.0
Black or African American alone	381	0.3
American Indian and Alaska Native alone	1,570	1.1
Asian alone	925	0.7
Native Hawaiian and Other Pacific Islander alone	117	0.1
Some Other Race alone	117	0.1
Two or More Races	2,662	1.9
RELATIONSHIP		
Total population	138,494	100.0
In households	137,006	98.9
Householder	54,200	39.1
Spouse [6]	29,233	21.1
Child	39,152	28.3
Own child under 18 years	31,098	22.5
Other relatives	5,812	4.2
Under 18 years	2,329	1.7
65 years and over	891	0.6
Nonrelatives	8,609	6.2
Under 18 years	723	0.5
65 years and over	400	0.3
Unmarried partner	3,829	2.8
In group quarters	1,488	1.1

Subject	Number	Percent
Institutionalized population	917	0.7
Male	475	0.3
Female	442	0.3
Noninstitutionalized population	571	0.4
Male	294	0.2
Female	277	0.2
HOUSEHOLDS BY TYPE		
Total households	54,200	100.0
Family households (families) [7]	37,316	68.8
With own children under 18 years	16,258	30.0
Husband-wife family	29,233	53.9
With own children under 18 years	11,312	20.9
Male householder, no wife present	2,676	4.9
With own children under 18 years	1,627	3.0
Female householder, no husband present	5,407	10.0
With own children under 18 years	3,319	6.1
Nonfamily households [7]	16,884	31.2
Householder living alone	13,170	24.3
Male	5,755	10.6
65 years and over	1,526	2.8
Female	7,415	13.7
65 years and over	3,633	6.7
Households with individuals under 18 years	17,797	32.8
Households with individuals 65 years and over	14,256	26.3
Average household size	2.53	(X)
Average family size [7]	2.99	(X)
HOUSING OCCUPANCY		
Total housing units	63,177	100.0
Occupied housing units	54,200	85.8
Vacant housing units	8,977	14.2
For rent	1,326	2.1
Rented, not occupied	66	0.1
For sale only	1,283	2.0
Sold, not occupied	169	0.3
For seasonal, recreational, or occasional use	5,181	8.2
All other vacants	952	1.5
Homeowner vacancy rate (percent) [8]	3.2	(X)
Rental vacancy rate (percent) [9]	7.7	(X)
HOUSING TENURE		
Occupied housing units	54,200	100.0
Owner-occupied housing units	38,353	70.8
Population in owner-occupied housing units	98,338	(X)
Average household size of owner-occupied units	2.56	(X)
Renter-occupied housing units	15,847	29.2
Population in renter-occupied housing units	38,668	(X)
Average household size of renter-occupied units	2.44	(X)

X Not applicable.

[1] Other Asian alone, or two or more Asian categories.

[2] Other Pacific Islander alone, or two or more Native Hawaiian and Other Pacific Islander categories.

[3] One of the four most commonly reported multiple-race combinations nationwide in Census 2000.

[4] In combination with one or more of the other races listed. The six numbers may add to more than the total population, and the six

percentages may add to more than 100 percent because individuals may report more than one race.

[5] This category is composed of people whose origins are from the Dominican Republic, Spain, and Spanish-speaking Central or South American countries. It also includes general origin responses such as "Latino" or "Hispanic."

[6] "Spouse" represents spouse of the householder. It does not reflect all spouses in a household. Responses of "same-sex spouse" were edited during processing to "unmarried partner."

[7] "Family households" consist of a householder and one or more other people related to the householder by birth, marriage, or adoption. They do not include same-sex married couples even if the marriage was performed in a state issuing marriage certificates for same-sex couples. Same-sex couple households are included in the family households category if there is at least one additional person related to the householder by birth or adoption. Same-sex couple households with no relatives of the householder present are tabulated in nonfamily households. "Nonfamily households" consist of people living alone and households which do not have any members related to the householder.

[8] The homeowner vacancy rate is the proportion of the homeowner inventory that is vacant "for sale." It is computed by dividing the total number of vacant units "for sale only" by the sum of owner-occupied units, vacant units that are "for sale only," and vacant units that have been sold but not yet occupied; and then multiplying by 100.

[9] The rental vacancy rate is the proportion of the rental inventory that is vacant "for rent." It is computed by dividing the total number of vacant units "for rent" by the sum of the renter-occupied units, vacant units that are "for rent," and vacant units that have been rented but not yet occupied; and then multiplying by 100.

Source: U.S. Census Bureau, 2010 Census.

Appendix 5-K

Agency Consultation

THIS PAGE WAS INTENTIONALLY LEFT BLANK

March 22, 2019

Shane Slate
U.S. Army Corps of Engineers (USACE) Regulatory Division – Coeur d'Alene Field Office
1910 Northwest Blvd. Suite 210
Coeur d'Alene, ID 83814

RE: Bayview Water and Sewer District Drinking Water Improvement Project – Request for Comments for Preparation of an Environmental Information Document

Dear Shane:

The Bayview Water and Sewer District (the District) is preparing a facility planning document to identify and make necessary improvements to their drinking water system that are cost effective and environmentally sound. The facility plan for this project is being funded 50 percent by an Idaho Department of Environmental Quality (DEQ) planning grant which requires compliance with the Rules for Administration of Planning Grants for Drinking Water Facilities, IDAPA 58.01.22.

The purpose of this letter is to request your review and response regarding any environmental impacts that your agency may identify for this proposed project pursuant to the DEQ's State Environmental Review Process, which originates from the National Environmental Policy Act.

The proposed project consists of:

- Constructing a new 300,000-gallon water storage tank.
- Constructing a new 12-inch distribution main along the west side of the District's existing system to connect with the new storage tank.
- Constructing a new 12-inch transmission main to the District's distribution network.
- General improvements to the water supply system, including:
    - Addition of an automatic transfer switch for the existing generator at Well 7
    - Upgrading the existing supervisory control and data acquisition (SCADA) system
    - Aggregating water rights and water supply diversion points with a municipal designation.

The project is being proposed to address leaks and deficiencies in the storage and transmission systems that are resulting in a 50 percent loss of annual water production. **Enclosed** are maps of the Area of Potential Effects (APE) and the Proposed Project Planning Area (PPPA) that depict the proposed project improvements and area of potential effect for all construction activities.

a 7825 Meadowlark Way, Coeur d'Alene, ID 83815 *p* 208 762 8787 *f* 208 762 9797 *w* www.jub.com

Wetland sites located in the District are generally associated with Bayview Creek and Lake Pend Oreille. Portions of Bayview Creek within the District have riverine and freshwater emergent wetland designations. Additionally, an approximately one-third acre freshwater pond connected to the Bayview Creek exists to the northwest of the District. **Enclosed** are wetlands maps showing the APE and PPPA. These maps are provided for general reference and do not constitute a wetlands determination.

The proposed improvements are not expected to impact wetlands. Pipeline replacement work in the vicinity of Bayview Creek will occur in pre-existing crossings of the creek and the new storage tank location is not expected to impact the creek or the freshwater pond identified on the wetlands maps. USACE will be consulted if work near a wetland is determined to be unavoidable and appropriate measures will be implemented to mitigate impacts to wetland areas.

We request that you advise us of any comments that you may have regarding this project within 30 days so the District can proceed with the completion of the environmental review portion of their planning process. Please send the response via e-mail or by hard copy to:

J-U-B ENGINEERS, Inc.
Attn: Paul Klatt
7825 Meadowlark Way
Coeur d'Alene, ID 83815
pklatt@jub.com

It will be assumed no comments are forthcoming if comments are not received within 30 days. If you have any questions concerning this proposed project or if you need any further information, please feel free to contact Paul Klatt at (208) 762-8787 or pklatt@jub.com at your convenience.

Sincerely,

J-U-B ENGINEERS, Inc.

Paul C Klatt

Paul Klatt, P.E.
Project Manager

PAK/cmt

cc (via e-mail): Sharon Meyer, Board Chair (bwsdsharonk@hotmail.com)
Adam Oliver, Idaho Department of Environmental Quality (adam.oliver@deq.idaho.gov)
Chris Horgan, J-U-B Engineers, Inc. (chorgan@jub.com)

Enclosures
Area of Potential Effect (APE) Map
Wetlands Map for Area of Potential Effect
Proposed Project Planning Area (PPPA) Map
Wetlands Map for Bayview Creek Area of Proposed Project Planning Area

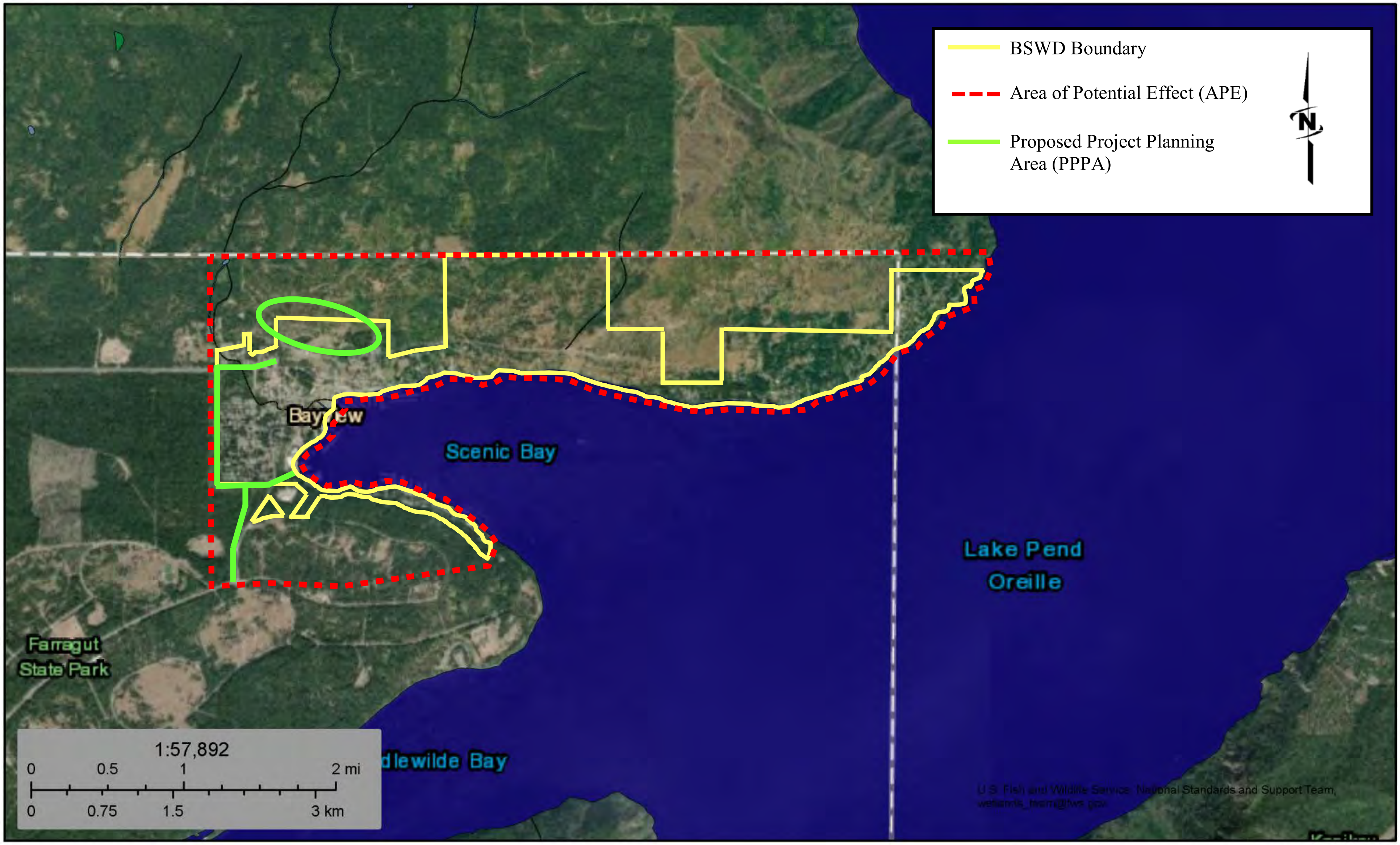
\\CDAFILES\Public\Projects\JUB\20-17-070 BWSD Facility Plan\Documents\Environmental\Agency Consultation\L_USACE_ShaneSlate_BWSD Water System Improvements.docx

Area of Potential Effect (APE) for Proposed BWSD Improvements

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands Map for Area of Proposed Effect (APE) for Proposed BWSD Improvements



September 28, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Proposed Project Planning Area (PPPA) for Proposed BWSD Improvements

BSWD Boundary

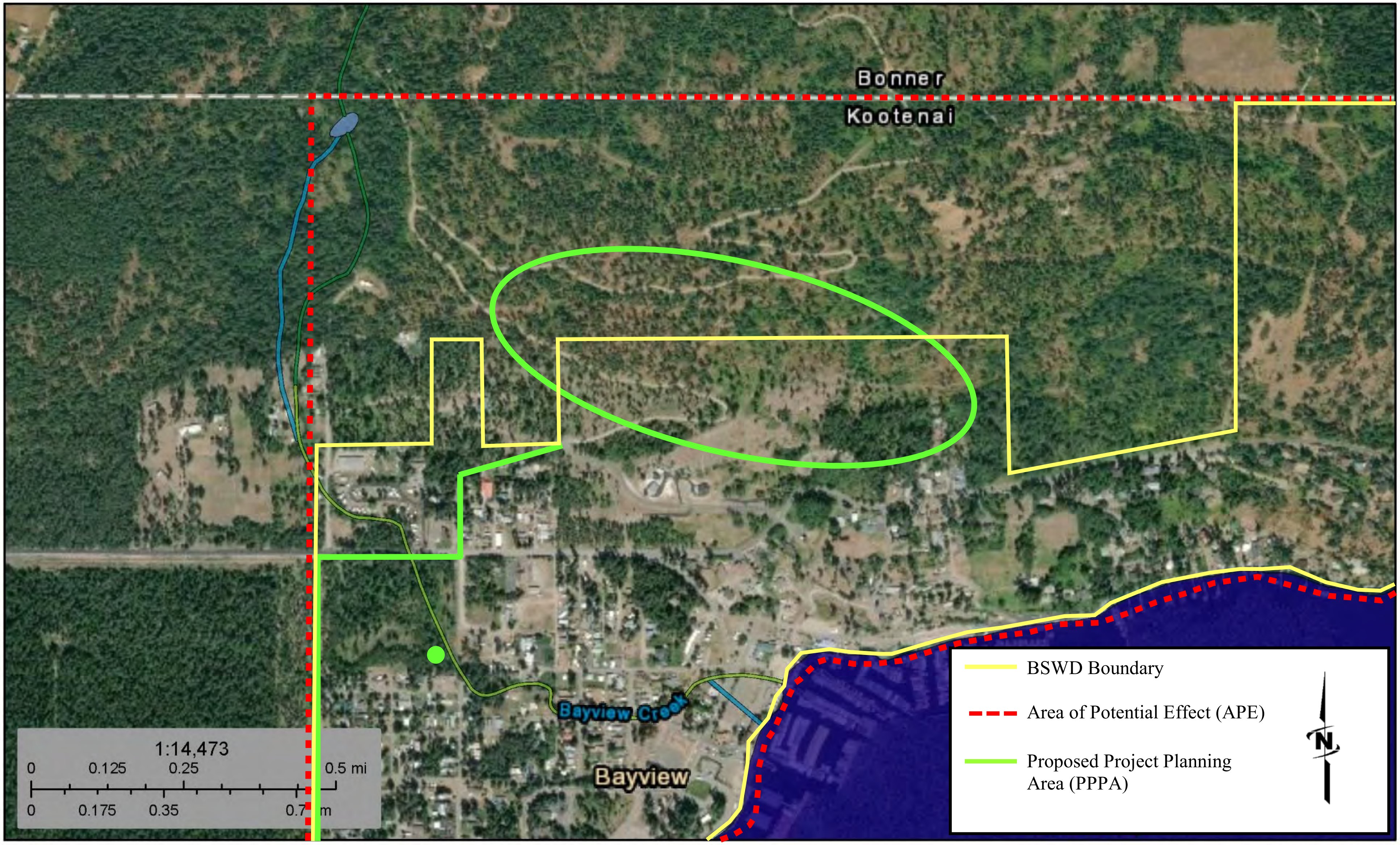
Area of Potential Effect (APE)

Proposed Project Panning Area (PPPA)

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands Map for Bayview Creek Area of Proposed Project Planning Area (PPPA) for Proposed BWSD Improvements



September 28, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Phone Log Notes – Chris Horgan – BWSD Water System Facility Plan – USACE Consultation

April 22, 2019 - 10:48 a.m. - Shane Slate, U.S. Army Corps of Engineers - 208-433-4474 - CSCWD Pinehurst Riverbank Reinforcement & BWSD Water System Improvements/Facility Plan I left Shane a message checking in on: • March 22, 2019 letter requesting environmental review comments on BWSD Water Improvements Project • March 18, 2019 Joint Application for Permit for CSCWD Pinehurst Riverbank Reinforcement

March 22, 2019

Ashley Brown
Idaho State Historic Preservation Office
210 Main Street
Boise, ID 83702

RE: Bayview Water and Sewer District Drinking Water Improvement Project – Request for Comments for Preparation of an Environmental Information Document

Dear Ashley:

The Bayview Water and Sewer District (District) is preparing a facility planning document to identify and make necessary improvements to their drinking water system that are cost effective and environmentally sound. The facility plan for this project is being funded 50 percent by an Idaho Department of Environmental Quality (DEQ) planning grant which requires compliance with the Rules for Administration of Planning Grants for Drinking Water Facilities, IDAPA 58.01.22.

The purpose of this letter is to request your review and response regarding any environmental impacts that your agency may identify for this proposed project pursuant to the DEQ's State Environmental Review Process, which originates from the National Environmental Policy Act.

The proposed project consists of:

- Constructing a new 300,000-gallon water storage tank.
- Constructing a new 12-inch distribution main along the west side of the District's existing system to connect with the new storage tank.
- Constructing a new 12-inch transmission main to the District's distribution network.
- General improvements to the water supply system, including:
    - Addition of an automatic transfer switch for the existing generator at Well 7
    - Upgrading the existing supervisory control and data acquisition (SCADA) system
    - Aggregating water rights and water supply diversion points with a municipal designation

The project is being proposed to address leaks and deficiencies in the storage and transmission systems that are resulting in a 50 percent loss of annual water production. **Enclosed** are maps of the Area of Potential Effect (APE) and the Proposed Project Planning Area (PPPA) that depict the proposed project improvements and area of potential effect for all construction activities.

There are two sites on the National Register of Historic Places in Idaho located near Bayview; the Bayview School and the Lake Pend Oreille Lime and Cement Historic District. The Bayview School is anticipated to be outside the APE and PPPA. The Lime and Cement Historic District is located within the PPPA but impacts from the proposed improvements are not anticipated. An excerpt from the National Register of Historic Places in Idaho is **enclosed** for reference.

We request that you advise us of any comments that you may have regarding this project within 30 days so the District can proceed with the completion of the environmental review portion of their planning process. Please send the response via e-mail or by hard copy to:

J-U-B ENGINEERS, Inc.
Attn: Paul Klatt
7825 Meadowlark Way
Coeur d'Alene, ID 83815
pklatt@jub.com

It will be assumed no comments are forthcoming if comments are not received within 30 days. If you have any questions concerning this proposed project or if you need any further information, please feel free to contact Paul Klatt at (208) 762-8787 or pklatt@jub.com at your convenience.

Sincerely,

J-U-B ENGINEERS, Inc.

Paul C. Klatt

Paul Klatt, P.E.
Project Manager

PAK/cmt

C (via e-mail) Sharon Meyer, Board Chair (bwsdsharonk@hotmail.com)
Adam Oliver, Idaho Department of Environmental Quality (adam.oliver@deq.idaho.gov)
Chris Horgan, J-U-B Engineers, Inc. (chorgan@jub.com)

Enclosures Area of Potential Effect (APE) Map
Proposed Project Planning Area (PPPA) Map
Excerpt from National Register of Historic Places in Idaho

Area of Potential Effect (APE) for Proposed BWSD Improvements

Proposed Project Planning Area (PPPA) for Proposed BWSD Improvements

	BSWD Boundary
	Area of Potential Effect (APE)
	Proposed Project Panning Area (PPPA)

Van Wagener, Jacob B., Barn
5581 US 93, 4.0 mi. E and 3.0 mi. S of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002310 (C)

Van Wagener, Jacob B., Caretaker's House
4.0 mi. E and 3.0 mi. S of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002311 (C)

Veazie, William T. and Clara H., House
SW of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002312 (C)

Vipham, Thomas, House
313 E. Ave. D, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002314 (C)

Webster, Archie, House
Corner of West Avenue B, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002316 (C)

Weigle, William, House and Water Tank
NW of Jerome, Jerome vicinity
9/8/1983
Lava Rock Structures in South Central Idaho TR
83002315 (C)

KOOTENAI COUNTY

ATHOL

Cedar Mountain School
Parks & Lewellwen Creek rds., Athol vicinity
9/12/1985
Kootenai County Rural Schools TR
85002093 (A, C)

BAYVIEW

Bayview School II
Careywood Rd., 0.5 mi. W. of scenic Bay, Bayview
9/12/1985
Kootenai County Rural Schools TR
85002090 (A, C)

Lake Pend Oreille Lime and Cement Industry Historic District
Roughly, discontiguous sites around Bayview and Lakeview, Bayview vicinity
3/27/1997
94001450 (A, D)

CAMP MIVODEN

East Hayden Lake School II
Hayden Lake Rd., Camp Mivoden vicinity
9/12/1985
Kootenai County Rural Schools TR
85002095 (A, C)

CATALDO

Cataldo Mission
Off U.S. 10, Cataldo
10/15/1966
National Historic Landmark
66000312 (A, C, D)

CLARKSVILLE

Clark House
Hayden Lake, Clarksville
12/12/1978
78001070 (C)

COEUR D'ALENE

Coeur d'Alene City Hall
424 Sherman Ave., Coeur d'Alene
8/3/1979
79000792 (C)

Coeur d'Alene Federal Building
SW corner of 4th and Lakeside Ave. (205 4th), Coeur d'Alene
12/16/1977
77000461 (C)

Coeur d'Alene Masonic Temple
524 Sherman Ave., Coeur d'Alene
5/22/1978
78001071 (C)

Davey, Harvey M., House
315 Wallace Ave., Coeur d'Alene
5/23/1985
85001126 (C)

First United Methodist Church
618 Wallace Ave., Coeur d'Alene
6/18/1979
79000793 (C)

Fort Sherman Buildings
North Idaho College campus, Coeur d'Alene
11/25/1979
79000794 (A)

Gray, John P. and Stella, House
521 S. 13th St., Coeur d'Alene
3/3/1988
88000272 (B, C)

Inland Empire Electric Railway Substation
Mullan Rd. and Northwest Blvd., Coeur d'Alene
6/27/1975
75000633 (A)

Kootenai County Courthouse
501 Government Way, Coeur d'Alene
12/23/1977
77000462 (C)

IDAHO STATE
HISTORICAL
SOCIETY

April 4, 2019

Paul Klatt
J-U-B Engineers, Inc.
7825 Meadowlark Way
Coeur d'Alene, ID 83815

Re: Bayview Water and Sewer District Drinking Water Improvement Project, Bayview, Kootenai County, Idaho / SHPO Review No.: 2019-517

Dear Mr. Klatt,

Thank you for consulting with our office on the above referenced project. We understand the scope of the work includes necessary improvements to drinking water system of Bayview, Kootenai County, Idaho. Work will consist of constructing a new 300,000-gallon water storage tank, new 12-inch distribution main, automatic transfer switch, upgrading supervisory control and data acquisition (SCADA) system, and aggregating water rights.

Based on the information received 25 March 2019, our office is concerned the proposed project actions may have the potential to affect historic properties. The Area of Potential Effect (APE) has been utilized historically and is in close proximity to water (Lake Pend Oreille). Our office recommends a cultural resources inventory be conducted of the APE to identify any cultural resources within the APE. This survey should be conducted by an individual or firm meeting the Secretary of the Interior's Professional Qualifications for archaeology and architectural history. The report should indicate the height of the new water storage tank and any potential direct or indirect visual effects to local historic properties.

A list of qualified professionals can be found on the State Historic Preservation Office's (SHPO) website. You can find the list of qualified professionals on SHPO's website at https://history.idaho.gov/section-106/hiring-a-consultant. This list is provided as a courtesy by SHPO to those interested in hiring cultural resource consultants. Inclusion on this list should not be viewed as an endorsement or recommendation by the SHPO; ultimately it is up to the hirer to confirm that the consultant meets the Secretary of the Interior's Professional Qualification Standards.

+

Brad Little
Governor of Idaho

Janet Gallimore
Executive Director
State Historic
Preservation Officer

Administration:
2205 Old Penitentiary Rd.
Boise, Idaho 83712
208.334.2682
Fax: 208.334.2774

Idaho State Museum:
610 Julia Davis Dr.
Boise, Idaho 83702
208.334.2120

Idaho State Archives and State Records Center:
2205 Old Penitentiary Rd.
Boise, Idaho 83712
208.334.2620

State Historic Preservation Office:
210 Main St.
Boise, Idaho 83702
208.334.3861

Old Idaho Penitentiary and Historic Sites:
2445 Old Penitentiary Rd.
Boise, Idaho 83712
208.334.2844

HISTORY.IDAHO.GOV

More information and guidance about conducting historical property inventories within Idaho can be found at our website at https://history.idaho.gov/site-inventories. We appreciate your consulting with our office and look forward to receiving a report which documents the survey and provides an overall recommendation regarding project effect. If you have any questions, don't hesitate to contact me at elizabeth.witkowski@ishs.idaho.gov or (208) 488-7467.

Sincerely,

Elizabeth Witkowski

Elizabeth C. Witkowski, M.A.
Compliance Archaeologist
Idaho State Historic Preservation Office

Phone Log Notes – Chris Horgan – BWSD Water System Facility Plan – SHPO Consultation

April 22, 2019 - 9:29 a.m. - Elizabeth Witkowski, Idaho SHPO - (208) 488-7467 - Bayview WSD Water Facility Plan

I called Elizabeth regarding her April 4, 2019 letter which responded to our request from March 22, 2019 for comments on the BWSD proposed water system improvements as part of the IDEQ Facility Plan and environmental review process.

I asked about the comment regarding visual effects. Elizabeth said I should talk with Ashley Brown at 208-488-7463. I said I would.

Basically, SHPO is saying they don't have all the information for potential historic properties in the area, so they need a cultural resources and historic architecture survey before they can issue a "no effect" determination. This needs to be performed by someone on the list of qualified consultants on their website, also referenced in the letter. We need someone with cultural resources experience and historical architecture experience. The report needs to follow the guidelines and checklists, also on SHPO's website. The report gets submitted to SHPO and they review and provide a determination or ask for additional information.

With respect to timing, SHPO prefers to get the cultural resources survey completed and their determination issued prior to a NEPA document (e.g., FONSI) being issued. However, that is not a hard and fast rule.

Next Steps

- Chris to call Ashley Brown to get more info on visual impacts comment in review letter.
- Chris to follow-up with IDEQ to determine how they want us to approach SHPO's comments.
    - Do we need the cultural resources survey prior to finalizing the Facility Plan?
- If/when the cultural resources survey is required
    - BWSD hires a consultant off SHPO's list
    - Consultant to check-in with IDEQ and SHPO to verify scope

NOTE: Elizabeth will no longer be working at SHPO after this week. Ashley Brown will be the main point of contact.

April 22, 2019 - 10:45 a.m. - Ashley Brown, Idaho SHPO - (208) 488-7463 - Bayview WSD Water Facility Plan

I left a message for Ashley about the BWSD agency consultation letter.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502
www.deq.idaho.gov

Governor Brad Little
Director John H. Tippets

March 28, 2019

CERTIFIED MAIL NO: 7012 3050 0001 2127 4373
RETURN RECEIPT REQUESTED

Dr. Jill Wagner, THPO
Coeur d'Alene Tribe of Idaho
P.O. Box 408
Plummer, ID 83851

RE: Bayview Water & Sewer District Drinking Water Project – Request for Comments for Preparation of an Environmental Information Document

Dear Dr. Wagner:

The Bayview Water & Sewer District (District) is preparing a facility planning document to identify and make necessary improvements to their drinking water that are cost effective and environmentally sound. The facility plan for this project is being funded 50% by a Department of Environmental Quality (DEQ) planning grant which requires compliance with the Rules for Administration of Planning Grants for Drinking Water Facilities, IDAPA 58.01.22. The purpose of this letter is to request your review and response regarding any historic and cultural resource impacts that the Coeur d'Alene Tribe may identify for this proposed project pursuant to the DEQ State Environmental Review Process, which originates from the National Environmental Policy Act.

The proposed project consists of:

- Construct a new 300,000-gallon water storage tank
- Construct a new 12-inch distribution main along the west side of the District's existing system to connect with the new storage tank
- Construct a new 12-inch transmission main to the District's distribution network
- General improvements to the water supply system, including:
    - Addition of an automatic transfer switch for the existing generator at Well 7
    - Upgrade the existing supervisory control and data acquisition (SCADA) system
    - Aggregate water rights and water supply diversion points with a municipal designation

The project is being proposed to address leaks and deficiencies in the storage and transmission systems that are resulting in a 50 percent loss of annual water production. Enclosed are maps of the proposed project planning area that depict the proposed project improvements and area of potential effect for all construction activities.

We request that you advise us of any comments that you may have regarding this project within 30 days, so the District can proceed with the completion of the Environmental Information Document.

If you have any questions concerning this proposed project or if you need any further information, please feel free to contact Adam Oliver at adam.oliver@deq.idaho.gov or (208) 373-0406 at your convenience.

Sincerely,

Adam Oliver
Environmental Analyst

AO:tg

Enclosed: Map(s)

c: Paul Klatt, JUB Engineers, pklatt@jub.com
Chris Horgan, JUB Engineers, chorgan@jub.com

Proposed Project Planning Area (PPPA) for Proposed BWSD Improvements

BSWD Boundary

Area of Potential Effect (APE)

Proposed Project Panning Area (PPPA)

Area of Potential Effect (APE) for Proposed BWSD Improvements

Christopher Horgan

From: Adam.Oliver@deq.idaho.gov
Sent: Monday, May 6, 2019 10:00 AM
To: Christopher Horgan
Subject: RE: BWSD Water System Improvements - THPO Consultations

[External Email]

Hi Chris,

I did not receive any comments from the tribes that were consulted.

Let me know when you'd like to have a call about this with Katy as well. I am available most of this week, besides Thursday morning and early afternoon.

Adam Oliver | Environmental Analyst
Idaho Department of Environmental Quality
1410 North Hilton, Boise, ID 83706
Office: (208) 373-0406
http://www.deq.idaho.gov/

From: Christopher Horgan [mailto:chorgan@jub.com]
Sent: Monday, May 6, 2019 10:32 AM
To: Adam Oliver
Subject: BWSD Water System Improvements - THPO Consultations

Adam-

Good Morning and Happy Monday! I had a reminder pop up this morning to check-in with you on the THPO consultations for the BWSD water system improvements. Can you give me a quick update on where things stand with those consultations?

Also, I talked last week with Katy Baker-Casile up here in the Cd'A Regional IDEQ office about how we proceed with the Facility Plan and agency comments, specifically SHPO's notes on the cultural resources survey. Once we have all the THPO comments, I think it would be worth getting the three of us on the phone for a quick check-in and to make a plan moving forward.

-Chris

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502
www.deq.idaho.gov

Governor Brad Little
Director John H. Tippets

March 28, 2019

CERTIFIED MAIL NO: 7016 1370 0000 2336 7404
RETURN RECEIPT REQUESTED

Ms. Marcia Pablo, THPO
Confederate Salish & Kootenai Tribes
P.O. Box 278
Pablo, MT 59855

RE: Bayview Water & Sewer District Drinking Water Project – Request for Comments for Preparation of an Environmental Information Document

Dear Ms. Pablo:

The Bayview Water & Sewer District (District) is preparing a facility planning document to identify and make necessary improvements to their drinking water that are cost effective and environmentally sound. The facility plan for this project is being funded 50% by a Department of Environmental Quality (DEQ) planning grant which requires compliance with the Rules for Administration of Planning Grants for Drinking Water Facilities, IDAPA 58.01.22. The purpose of this letter is to request your review and response regarding any historic and cultural resource impacts that the Confederate Salish & Kootenai Tribes may identify for this proposed project pursuant to the DEQ State Environmental Review Process, which originates from the National Environmental Policy Act.

The proposed project consists of:

- Construct a new 300,000-gallon water storage tank
- Construct a new 12-inch distribution main along the west side of the District's existing system to connect with the new storage tank
- Construct a new 12-inch transmission main to the District's distribution network
- General improvements to the water supply system, including:
    - Addition of an automatic transfer switch for the existing generator at Well 7
    - Upgrade the existing supervisory control and data acquisition (SCADA) system
    - Aggregate water rights and water supply diversion points with a municipal designation

The project is being proposed to address leaks and deficiencies in the storage and transmission systems that are resulting in a 50 percent loss of annual water production. Enclosed are maps of the proposed project planning area that depict the proposed project improvements and area of potential effect for all construction activities.

We request that you advise us of any comments that you may have regarding this project within 30 days, so the District can proceed with the completion of the Environmental Information Document.

If you have any questions concerning this proposed project or if you need any further information, please feel free to contact Adam Oliver at adam.oliver@deq.idaho.gov or (208)373-0406 at your convenience.

Sincerely,

Adam Oliver
Environmental Analyst

AO:tg

Enclosed: Map(s)

c: Paul Klatt, JUB Engineers, pklatt@jub.com
Chris Horgan, JUB Engineers, chorgan@jub.com

Proposed Project Planning Area (PPPA) for Proposed BWSD Improvements

(yellow line)	BSWD Boundary
(red dashed line)	Area of Potential Effect (APE)
(green line)	Proposed Project Panning Area (PPPA)

Area of Potential Effect (APE) for Proposed BWSD Improvements

Christopher Horgan

From: Adam.Oliver@deq.idaho.gov
Sent: Monday, May 6, 2019 10:00 AM
To: Christopher Horgan
Subject: RE: BWSD Water System Improvements - THPO Consultations

[External Email]

Hi Chris,

I did not receive any comments from the tribes that were consulted.

Let me know when you'd like to have a call about this with Katy as well. I am available most of this week, besides Thursday morning and early afternoon.

Adam Oliver | Environmental Analyst
Idaho Department of Environmental Quality
1410 North Hilton, Boise, ID 83706
Office: (208) 373-0406
http://www.deq.idaho.gov/

From: Christopher Horgan [mailto:chorgan@jub.com]
Sent: Monday, May 6, 2019 10:32 AM
To: Adam Oliver
Subject: BWSD Water System Improvements - THPO Consultations

Adam-

Good Morning and Happy Monday! I had a reminder pop up this morning to check-in with you on the THPO consultations for the BWSD water system improvements. Can you give me a quick update on where things stand with those consultations?

Also, I talked last week with Katy Baker-Casile up here in the Cd'A Regional IDEQ office about how we proceed with the Facility Plan and agency comments, specifically SHPO's notes on the cultural resources survey. Once we have all the THPO comments, I think it would be worth getting the three of us on the phone for a quick check-in and to make a plan moving forward.

-Chris

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502
www.deq.idaho.gov

Governor Brad Little
Director John H. Tippets

March 28, 2019

CERTIFIED MAIL NO: 7016 1370 0000 2336 7398
RETURN RECEIPT REQUESTED

Mr. Kevin Lyons
Cultural Resource Program Manager
Kalispel Tribe
P.O. Box 39
Usk, WA 99180

RE: Bayview Water & Sewer District Drinking Water Project – Request for Comments for Preparation of an Environmental Information Document

Dear Mr. Lyons:

The Bayview Water & Sewer District (District) is preparing a facility planning document to identify and make necessary improvements to their drinking water that are cost effective and environmentally sound. The facility plan for this project is being funded 50% by a Department of Environmental Quality (DEQ) planning grant which requires compliance with the Rules for Administration of Planning Grants for Drinking Water Facilities, IDAPA 58.01.22. The purpose of this letter is to request your review and response regarding any historic and cultural resource impacts that the Kalispel Tribe may identify for this proposed project pursuant to the DEQ State Environmental Review Process, which originates from the National Environmental Policy Act.

The proposed project consists of:

- Construct a new 300,000-gallon water storage tank
- Construct a new 12-inch distribution main along the west side of the District's existing system to connect with the new storage tank
- Construct a new 12-inch transmission main to the District's distribution network
- General improvements to the water supply system, including:
    - Addition of an automatic transfer switch for the existing generator at Well 7
    - Upgrade the existing supervisory control and data acquisition (SCADA) system
    - Aggregate water rights and water supply diversion points with a municipal designation

The project is being proposed to address leaks and deficiencies in the storage and transmission systems that are resulting in a 50 percent loss of annual water production. Enclosed are maps of the proposed project planning area that depict the proposed project improvements and area of potential effect for all construction activities.

We request that you advise us of any comments that you may have regarding this project within 30 days, so the District can proceed with the completion of the Environmental Information Document.

If you have any questions concerning this proposed project or if you need any further information, please feel free to contact Adam Oliver at adam.oliver@deq.idaho.gov or (208) 373-0406 at your convenience.

Sincerely,

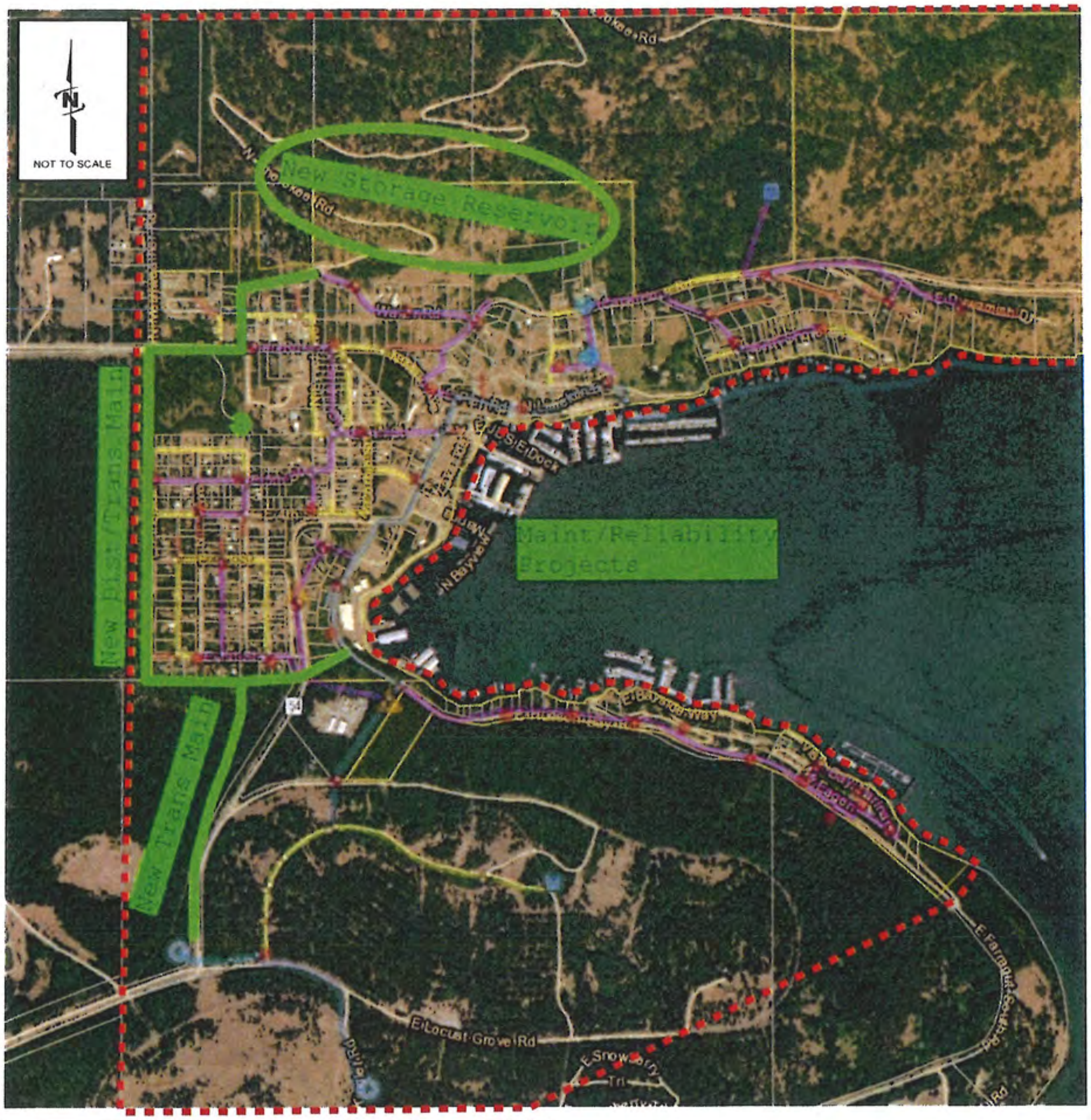
Adam Oliver
Environmental Analyst

AO:tg

Enclosure: Map(s)

c: Paul Klatt, JUB Engineers, pklatt@jub.com
Chris Horgan, JUB Engineers, chorgan@jub.com

Proposed Project Planning Area (PPPA) for Proposed BWSD Improvements



BSWD Boundary

Area of Potential Effect (APE)

Proposed Project Panning Area (PPPA)

Area of Potential Effect (APE) for Proposed BWSD Improvements

Christopher Horgan

From: Adam.Oliver@deq.idaho.gov
Sent: Monday, May 6, 2019 10:00 AM
To: Christopher Horgan
Subject: RE: BWSD Water System Improvements - THPO Consultations

[External Email]

Hi Chris,

I did not receive any comments from the tribes that were consulted.

Let me know when you'd like to have a call about this with Katy as well. I am available most of this week, besides Thursday morning and early afternoon.

Adam Oliver | Environmental Analyst
Idaho Department of Environmental Quality
1410 North Hilton, Boise, ID 83706
Office: (208) 373-0406
http://www.deq.idaho.gov/

From: Christopher Horgan [mailto:chorgan@jub.com]
Sent: Monday, May 6, 2019 10:32 AM
To: Adam Oliver
Subject: BWSD Water System Improvements - THPO Consultations

Adam-

Good Morning and Happy Monday! I had a reminder pop up this morning to check-in with you on the THPO consultations for the BWSD water system improvements. Can you give me a quick update on where things stand with those consultations?

Also, I talked last week with Katy Baker-Casile up here in the Cd'A Regional IDEQ office about how we proceed with the Facility Plan and agency comments, specifically SHPO's notes on the cultural resources survey. Once we have all the THPO comments, I think it would be worth getting the three of us on the phone for a quick check-in and to make a plan moving forward.

-Chris

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502
www.deq.idaho.gov

Governor Brad Little
Director John H. Tippets

March 28, 2019

CERTIFIED MAIL NO.: 7016 0000 2336 7381
RETURN RECEIPT REQUESTED

Ms. Josie Shottanana
Cultural Resource Program
Kootenai Tribal Council
P.O. Box 1269
Bonners Ferry, ID 83805

RE: Bayview Water & Sewer District Drinking Water Project – Request for Comments for Preparation of an Environmental Information Document

Dear Ms. Shottanana:

The Bayview Water & Sewer District (District) is preparing a facility planning document to identify and make necessary improvements to their drinking water that are cost effective and environmentally sound. The facility plan for this project is being funded 50% by a Department of Environmental Quality (DEQ) planning grant which requires compliance with the Rules for Administration of Planning Grants for Drinking Water Facilities, IDAPA 58.01.22. The purpose of this letter is to request your review and response regarding any historic and cultural resource impacts that the Kootenai Tribal Council may identify for this proposed project pursuant to the DEQ State Environmental Review Process, which originates from the National Environmental Policy Act.

The proposed project consists of:

- Construct a new 300,000-gallon water storage tank
- Construct a new 12-inch distribution main along the west side of the District's existing system to connect with the new storage tank
- Construct a new 12-inch transmission main to the District's distribution network
- General improvements to the water supply system, including:
  - Addition of an automatic transfer switch for the existing generator at Well 7
  - Upgrade the existing supervisory control and data acquisition (SCADA) system
  - Aggregate water rights and water supply diversion points with a municipal designation

The project is being proposed to address leaks and deficiencies in the storage and transmission systems that are resulting in a 50 percent loss of annual water production. Enclosed are maps of the proposed project planning area that depict the proposed project improvements and area of potential effect for all construction activities.

We request that you advise us of any comments that you may have regarding this project within 30 days, so the District can proceed with the completion of the Environmental Information Document.

If you have any questions concerning this proposed project or if you need any further information, please feel free to contact Adam Oliver at adam.oliver@deq.idaho.gov or (208) 373-0406 at your convenience.

Sincerely,

Adam Oliver
Environmental Analyst

AO:tg

Enclosure: Map(s)

c: Paul Klatt, JUB Engineers, pklatt@jub.com
Chris Horgan, JUB Engineers, chorgan@jub.com

Proposed Project Planning Area (PPPA) for Proposed BWSD Improvements

	BSWD Boundary
	Area of Potential Effect (APE)
	Proposed Project Panning Area (PPPA)

Area of Potential Effect (APE) for Proposed BWSD Improvements

Christopher Horgan

From: Adam.Oliver@deq.idaho.gov
Sent: Monday, May 6, 2019 10:00 AM
To: Christopher Horgan
Subject: RE: BWSD Water System Improvements - THPO Consultations

[External Email]

Hi Chris,

I did not receive any comments from the tribes that were consulted.

Let me know when you'd like to have a call about this with Katy as well. I am available most of this week, besides Thursday morning and early afternoon.

Adam Oliver | Environmental Analyst
Idaho Department of Environmental Quality
1410 North Hilton, Boise, ID 83706
Office: (208) 373-0406
http://www.deq.idaho.gov/

From: Christopher Horgan [mailto:chorgan@jub.com]
Sent: Monday, May 6, 2019 10:32 AM
To: Adam Oliver
Subject: BWSD Water System Improvements - THPO Consultations

Adam-

Good Morning and Happy Monday! I had a reminder pop up this morning to check-in with you on the THPO consultations for the BWSD water system improvements. Can you give me a quick update on where things stand with those consultations?

Also, I talked last week with Katy Baker-Casile up here in the Cd'A Regional IDEQ office about how we proceed with the Facility Plan and agency comments, specifically SHPO's notes on the cultural resources survey. Once we have all the THPO comments, I think it would be worth getting the three of us on the phone for a quick check-in and to make a plan moving forward.

-Chris

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Appendix 5-L

IDEQ Environmental Review Correspondence

THIS PAGE WAS INTENTIONALLY LEFT BLANK

March 13, 2020

Adam Oliver, Environmental Analyst
Idaho Department of Environmental Quality
1410 North Hilton
Boise, ID 83706

RE: BAYVIEW WATER AND SEWER DISTRICT - WATER SYSTEM FACILITY PLAN – RESPONSE TO IDAHO DEPARTMENT OF ENVIRONMENT QUALITY (IDEQ) ENVIRONMENTAL REVIEW COMMENTS

Dear Adam:

Thank you for your environmental review comments on the Water System Facility Plan (Plan) for the Bayview Water and Sewer District. This letter provides responses to your comments, received via letter dated March 29, 2019. Your comments have been included below and are followed by our response.

1. Purpose and Need. The purpose and need section should be clear and concise, identifying what the public health and/or water quality concerns are for the system and how they will be properly addressed.

   ***Response**: The purpose of the Facility Plan is included in Technical Memorandum 1. A new paragraph (5.1.1) has been added to Technical Memorandum No. 5 to summarize the purpose and need for the proposed improvements.*

2. Proposed Project Planning Area. Provide a map that clearly identifies the proposed project planning area including the specific locations of the proposed project. Also, identify the area of potential effect if different than the proposed project planning area.

   Response: *Figure 5-1 represents the Proposed Project Planning Area (PPPA) and the Area of Potential Effect (APE). The text in Section 5.1.2 of Technical Memorandum No. 5 has been updated to this effect.*

3. Wetlands/Clean Water Act Section 404. Revise the wetland map in the EID to reflect the proposed project planning boundary and the specific project improvements to determine if any of the proposed project lies within the wetland areas. Please update these details in Section 5.2.7.

   ***Response:** The text in Section 5.2.7 of Technical Memorandum No. 5 has been updated to reflect potential impacts to wetland areas. As the District's implementation plan for potential projects is unknown at this point, no change was made to the wetland map in Appendix 5-D.*

a 7825 Meadowlark Way, Coeur d'Alene, ID 83815 p 208 762 8787 f 208 762 9797 w www.jub.com

4. Cultural and Historic Resources. We have already had communication about consultation requirements for Cultural and Historical Resources. Please continue with your consultation to the State Historical Preservation Office (SHPO). DEQ will consult with the Coeur d'Alene Tribe, Confederate Salish & Kootenai Tribe, Kootenai Tribal Council, and Kalispel Tribe. Please include all consultation correspondence.

    ***Response**: Information regarding agency consultation in included in Section 5.3 of Technical Memorandum No. 5, Appendix 5-K, and Appendix 5-L.*

5. Environmental Impacts. Upon providing clarification on the above items, update the environmental impacts section to reflect the most recent information. Please also update Table 4-8 – Summary of Environmental Concerns for Considered Alternatives.

    ***Response**: Table 4-11 (previously Table 4-8) has been updated to reflect potential impacts to wetland areas and agency consultation efforts.*

6. Wetlands/Clean Water Act Section 404. Please consult with Shane Slate (Shane.P.Slate@usace.army.mil) at the U.S. Army Corp of Engineers (ACOE) Coeur d'Alene office. Please include potential mitigation measures.

    Response: *Information regarding agency consultation is included in Section 5.3 of Technical Memorandum No. 5, Appendix 5-K, and Appendix 5-L. The U.S. Army Corps did not respond to our request for consultation.*

7. Cultural and Historic Resources. Include any mitigation measures (if any) received from SHPO and the Tribes.

    Response: *Information regarding agency consultation in included in Section 5.3 of Technical Memorandum No. 5, Appendix 5-K, and Appendix 5-L. The Tribes did not respond to our request for consultation. A discussion of SHPO's response is included in Section 5.3.2 of Technical Memorandum No. 5.*

8. Surface Water. Looking at the maps provided, it appears there may be a stream crossing of Bayview Creek. Please include mitigation measures for any stream crossings.

    Response: *The text in Section 5.2.7 of Technical Memorandum No. 5 has been updated to reflect potential impacts to wetland areas, including Bayview Creek.*

9. Public Participation. Please provide documentation of the public participation requirements. Also include documentation of the formally selected alternative.

    ***Response**: Public participation information and a discussion of the formally selected alternative/project is included in Technical Memorandum No. 4.*

10. Agency Follow-up. Include any agency follow-up documentation in the final Facility Plan such as a copy of a letter, an e-mail, or if making follow-up telephone calls to consulting agencies that have not responded to the initial letter, verification of the telephone conversations with follow-up e-mails.

    Response: *Information regarding agency consultation is included in Section 5.3 of Technical Memorandum No. 5, Appendix 5-K, and Appendix 5-L. Any additional correspondence will be included in the final Facility Plan.*

We will include the responses noted above in our technical review re-submittal to IDEQ. Please review our responses and the modifications to the Facility Plan and let me or Chris Horgan know if you have any questions or require additional information. Please feel free to call at (208) 762-8787 if you have any questions on our proposed responses or if you would like to talk about any of these items in additional detail. Once the Plan has technical approval, the District will solicit public comments on the preferred alternative, finalize the Plan, and close out their planning grant.

Sincerely,
J-U-B ENGINEERS, Inc.

Stephen P. James

Stephen P. James, P.E.
Area Manager

c. Calvin Nolan, Board Chair, Bayview Water and Sewer District (bwsd637@gmail.com)
Katy Baker-Casile, Idaho Department of Environmental Quality (katy.baker-casile@deq.idaho.gov)