WASTEWATER FACILITIES PLAN UPDATE

FOR

CITY OF JOHN DAY, OREGON

2019

Preparation of this study was funded in part with grant funds from the Infrastructure Finance Authority Financing Program administered by the Business Oregon.

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Acknowledgments

We wish to thank the members of the John Day City Council; Mayor Ron Lundborn; Nick Green, City Manager; Monte Legg, Public Works Director; Oryn Wyss, Wastewater Treatment Plant Operator; the Oregon Department of Environmental Quality; and the many others for their interest, guidance, and assistance during the course of preparation and completion of this Wastewater Facilities Plan Update.

Funding

This project was funded with a financial award from the Business Oregon - Infrastructure Finance Authority Technical Assistance Grant program.

Executive Summary

Overview

This section briefly summarizes the results of the Wastewater Facilities Plan (WWFP) Update prepared by Anderson Perry & Associates, Inc., for the City of John Day. The recommendations outlined hereafter have been developed in cooperation with the John Day City Council, City staff, Public Works Committee, and the Oregon Department of Environmental Quality (DEQ). The primary focus of this WWFP Update is on the treatment system. This WWFP Update includes an analysis of the existing system and its performance, an analysis of historical wastewater data and design criteria development, an evaluation of system deficiencies and needs, an evaluation of improvement alternatives, and development of a financial plan and project implementation plan. Included in this Executive Summary is a brief discussion of the existing wastewater system, the wastewater system improvements project selected by the City of John Day, the current financial status and loan capacity of the City, a discussion of potentially available funding sources, action items, and the implementation plan. The reader is encouraged to refer to the chapters of this WWFP Update for a more detailed discussion of the topics briefly outlined hereafter.

The City of John Day is in the process of developing an area plan for a portion of the City to be known as the Innovation Gateway. Formerly the site of the Oregon Pine Mill and the City's existing wastewater treatment facility (WWTF), the Innovation Gateway area would potentially house the City's new WWTF that would support commercial-scale hydroponic greenhouses through water reuse. Construction of the first greenhouses is underway with plans to add additional greenhouse in the future. A portion of the development will be dedicated commercial property for a farmers' market, restaurant/microbrewery, and the City's Public Works Department.

Existing Wastewater Collection and Treatment

Wastewater Collection System

Construction of the original wastewater collection system began in 1949. Major additions were completed in 1970 and 1978. Since 1978, the collection system has been expanded several times to support the City's growth.

The collection system consists of a single 18-inch interceptor and 6-, 8-, and 12-inch trunk and lateral lines that transport wastewater via gravity from the residential and commercial developments of the City of John Day and Canyon City to the WWTF. Three wastewater lift stations aid in the transportation of wastewater from low lying areas to the gravity collection system. One station, located west of the City near the Grant County Road Department Shops, collects wastewater from the Grant County facilities and pumps it via a 4-inch forcemain to the Patterson Road Lift Station. The Patterson Road Lift Station is located next to the John Day River on the intersection of Patterson Road and U.S. Highway 395. This lift station collects wastewater from developments in that area and pumps it to another lift station, referred to as the Bowling Alley Lift Station. The Bowling Alley Lift Station is located in front of the bowling alley along U.S. Highway 395, east of Northwest Lyons Street. The Bowling Alley Lift Station collects the wastewater pumped from the Patterson Road Lift Station and a small gravity line. Wastewater from the Bowling Alley Lift Station is pumped into the gravity system at a manhole located near the intersection of West Main Street and N.W. 3rd.

The system consists of approximately 84,145 lineal feet (LF) of 4-, 6-, 8-, 10-, 12-, and 18-inch gravity sewer pipe. In addition, there is approximately 10,528 LF of 4-, 6-, and 8-inch forcemain. The collection system has 357 manholes and 34 cleanouts, based on review of the collection system map.

In 2010, the City made improvements to the collection system to reduce infiltration and inflow identified in the 2010 WWFP. The improvements have proved to be effective, as indicated by the reduction in wastewater flows seen at the WWTF. In 2016, the per capita average annual flow, per capita wet weather flow, and per capita maximum monthly flow reflected a reduction when compared to the 2010 design criteria. The largest reduction is reflected in the maximum monthly flow, which decreased from 177 gallons per capita per day (gpcd) in 2010 to 116 gallons gpcd. That equates to a reduction of approximately 163,000 gallons per day.

Wastewater Treatment

The existing WWTF is located on the northwestern end of the City at the end of 7th Street. The City of John Day's existing mechanical WWTF provides secondary treatment of the City's domestic wastewater. Construction of the original WWTF was completed in 1949. However, due to continued expansion of the system, the original trickling filter facility became overloaded, resulting in the need for an upgraded treatment facility. In 1978, the facility was upgraded and incorporated several of the original plant structures from the 1949 treatment plant. The current facility consists of an influent lift station, a headworks structure, two primary clarifiers, two trickling filters, one secondary clarifier, gas chlorination and chlorine contact basin, four percolation ponds for effluent disposal, two-stage high rate anaerobic sludge digester, and four sludge drying beds

Minor modifications have been made to the WWTF since its construction in 1978. The secondary clarifier has been retrofitted to include a chlorination line around the launder to reduce algae growth. In addition, a floating cover was installed on the secondary anaerobic digester. Other modifications include changes to telemetry, electrical, controls, flowmeters, and the distribution piping to the percolation ponds.

Existing Wastewater System Evaluation Summary

Wastewater Treatment Facility Evaluation

Based upon the process evaluation, the City's WWTF is in need of major improvements, regardless of whether any growth occurs in the John Day and Canyon City service areas. The following factors indicate an upgrade is needed:

Age and Insufficient Capacity

A portion of the existing components and treatment units were constructed during the original 1949 plant construction. Due to these units being approximately 70 years old, they are showing severe degradation and will not serve the long-term treatment needs of the City and need replacement. Additionally, most of the existing facilities were constructed as part of the 1978 construction project and have been in service for approximately 40 years. These 40-year-old components are at the end or have surpassed their expected service life and need rehabilitation and/or replacement. Other units do not have adequate capacity or the ability to meet the

treatment needs of the City now or in the future. Refer to Chapter 3 for a more comprehensive discussion of the evaluation of the existing plant and the identified deficiencies.

Wastewater System Improvements Project

Four conceptual wastewater treatment alternatives and four conceptual effluent reuse and disposal options were evaluated during preparation of this WWFP Update. The conceptual treatment alternatives include no action, construct a new wastewater treatment lagoon system, construct a new mechanical WWTF, and construct a new wastewater treatment lagoon system and mechanical WWTF. The existing WWTF has many important components that have deteriorated beyond repair, surpassed their design life, lack the capacity to meet current and/or future demands, or lack the capability of meeting potential future permit requirements. Therefore, upgrading the existing WWTF is not considered in the discussion of WWTF alternatives.

The conceptual effluent reuse and disposal options include land application and beneficial reuse of Class A, B, and D effluent and an aquifer storage and recovery well. Based on work sessions and a review this WWFP Update, the John Day City Council selected the following to constitute its wastewater system improvements project. The selected improvements package is outlined in detail in Chapters 4 and 5. The year 2018 total estimated project cost for the selected wastewater system improvements project described hereafter is approximately $11.9 million as outlined below.

Mechanical Wastewater Treatment with Aerobic Digestion (Alternative B) Construction	$ 7,942,000
Purple Pipe Network Construction	$ 1,662,000
Administration, Legal, Engineering, and Contingencies (30 percent)	$ 2,880,000
Other Project Costs (Environmental, Equipment, etc.)	$ 265,000
Total Estimated Project Cost (Year 2018 Dollars)	$12,749,000

The DEQ has yet to identify a viable permit pathway. Therefore, no costs have been included in the estimated project costs for effluent reuse/disposal. When a viable permit pathway is selected, this WWFP Update will be amended to include the selected permit regulations and costs for constructing the identified reuse/disposal facility.

Selected Improvements

The selected alternative for treatment of wastewater and constructing a new mechanical WWTF involves the design and construction of a new membrane bioreactor (MBR) mechanical treatment facility with aerobic digestion and a purple pipe network as described and evaluated in Chapter 4. The selected WWTF improvements are shown on Figure 5-1 in Chapter 5.

One of the City's goals for the new WWTF and the Innovation Gateway is to educate the public on the importance of wastewater treatment. Generally, public perception of WWTFs is negative due to the odor and visual impacts associated with wastewater treatment. To counter the negative perception, the new WWTF will include a visitor's center that houses a tertiary treatment process consisting of hydroponic reactors. The hydroponic reactors are aerated wastewater tanks with suspended plant racks that receive secondary treated wastewater from the MBR. The visitor's center will provide an environment where the public can view wastewater treatment processes and learn about the benefits of reclaimed water.

Wastewater Treatment, Biosolids Treatment, and Effluent Disposal/Reuse

The City's existing WWTF has many components that have surpassed their service life and need to be replaced. Therefore, the City has decided to construct a new WWTF at a new location. The existing WWTF is anticipated to be demolished, and the area would be incorporated for use into the Innovation Gateway. The existing percolation ponds will be the only component of the existing WWTF that would remain. However, use of the percolation ponds as a method of disposal is expected to be temporary until the DEQ identifies a viable permit pathway. The City will pursue the purple pipe network as its primary method of effluent disposal, as the demand for reuse water exists. As effluent flows exceed reuse demands during the winter months, the City will dispose of effluent in the percolation ponds until another method of reuse/disposal is permitted. The City has selected aerobic digestion for biosolids treatment. A compost facility was considered; however, there are concerns regarding where to locate the compost facility to minimize the odor nuisance to the public. Further evaluation during the design phase indicates that a compost facility is still a viable option to reduce capital costs and maximize reuse capabilities.

Current Financial Status and Loan Capacity

The annual cost of operating and maintaining the wastewater system is summarized on Figure 6-1 in Chapter 6. This includes all costs for the wastewater system such as operation, maintenance, and replacement, staff payroll, and existing debt service. A graphical plot of the City of John Day's sewer system budget, both revenue and expenditures, is shown on Figure 6-2 in Chapter 6. By plotting a "trend" line for the expenditures, the expenditures in a future year can be estimated, assuming no changes to the wastewater system occur. The trend line for the City of John Day's operation and maintenance expenditures suggests expenditures will likely be in the range of $616,864 in the budget year 2019-20.

To determine the City's ability to fund a wastewater system improvements project, Figure 6-3 (in Chapter 6) was prepared. The data shown on Figure 6-3 provides a general idea of the amount of debt the City could service at various monthly wastewater costs. The total project cost of the selected wastewater improvements is estimated to be $12,749,000 (see Chapter 5). Assuming Canyon City pays 10 percent of the capital cost, John Day's portion of the project would be approximately $11,474,000. As shown on Figure 6-3, a wastewater rate of $70 per month would fund only a portion of the project with a loan. Given the current sewer rate is $46 per month, a $24 per month rate hike is not feasible. Therefore, it is important for the City to pursue potential grant funds or loan forgiveness to assist with project financing.

A major financial commitment will be required on the part of the City to implement the selected wastewater system improvements project outlined in this WWFP Update. Based on the estimated cost of the project, the City will need to obtain low interest loans coupled with grants to fund the project. The most likely sources of loan and grant funding are Business Oregon's Community Development Block Grant and Water/Wastewater program, the DEQ's Clean Water State Revolving Loan Fund program, the Oregon Water Resources Department, the New Market Tax Credit, and the U.S. Department of Agriculture's Rural Development programs. See Chapter 6 for a more detailed discussion of the potential project funding sources.

Project Implementation

The following action items and implementation steps need to be made by the City of John Day to implement the proposed wastewater system improvements project. The steps outlined are general in nature and include the major steps that would need to be undertaken.

Action Items

1. Formally adopt this WWFP Update.

2. Consult with funding agencies to ensure the best funding package is obtained for the project.

3. Prepare funding applications for the wastewater system improvements project.

4. Determine how to obtain the authorization to incur debt for the wastewater system improvements project. Once decided (revenue bond or general obligation bond), a bond attorney should be consulted, and the appropriate resolution paperwork should be prepared and considered for implementation.

5. Hold public information meetings to inform its citizens of the needs and scope of the project, to answer questions, and to generate support for a potential sewer rate increase.

Implementation Steps

Should the City wish to proceed with a wastewater system improvements project, the following Implementation Plan outlines the key steps the City would need to undertake to proceed with project implementation.

Item No.	ITEM	COMPLETION DATE
1.	Initiate funding discussions with funding agencies.	June 2018
2.	Adopt the WWFP Update.	Spring 2019
3.	Initiate design.	Spring 2019
4.	Consult with funding agencies as necessary and complete and submit the applications as necessary.	Fall 2019
5.	Finalize project funding.	Winter 2019
6.	Complete project design.	Winter 2019
7.	Bid and award construction contract.	Spring 2020
8.	Start project construction.	Spring 2020
9.	Complete project construction.	Fall 2021
10.	Close out project.	Winter 2021

The key to implementing part or all of the John Day wastewater system improvements project, as outlined in this Executive Summary, is the ability of the City to acquire a low-interest loan coupled with grant funding. The City will need to work closely with its citizens to inform them of the system needs and the necessity for increased sewer user costs. Depending on the scope of improvements, the City will need to plan on average user costs being increased to at least $50 to $70 per month, or annual property taxes increasing by approximately $6 to $8 per $1,000 of tax assessed value (or some

combination of the two), to obtain the loan and grant funds required to complete the project. Rates may be higher than this depending on the amount of grant funds available. Participation from Canyon City is vital for the City of John Day to be able to fund the selected alternative discussed in Chapter 5.

Chapter 1 - Background Information

Introduction

The City of John Day, Oregon, owns and operates a trickling filter wastewater treatment facility (WWTF). Currently, the City's wastewater system serves a population of 2,440 residents and several small commercial establishments in the Cities of John Day and Canyon City. The wastewater collection and treatment system operates under the authority of a Water Pollution Control Facilities (WPCF) Permit issued by the Oregon Department of Environmental Quality (DEQ). The WPCF Permit authorizes the City to discharge disinfected secondary treated effluent on-site utilizing percolation ponds.

In recent years, the City has become aware that the WWTF's percolation ponds may be degrading groundwater quality by raising the nitrate concentration, and the ponds may also be indirectly discharging treated wastewater into the John Day River. In addition to concerns of groundwater contamination, the WWTF is nearly 50 years old, with some components nearly 80 years old, all of which have exceeded their design life.

Authorization

Funding assistance for this Wastewater Facilities Plan (WWFP) Update was received from Business Oregon and other sources. The City of John Day, through an Agreement for Engineering Services signed on July 11, 2017, authorized Anderson Perry & Associates, Inc., to prepare this WWFP Update. This WWFP Update was generally completed in accordance with the DEQ's guidance document "Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities," dated August 2018.

Project Purpose

This WWFP Update has been prepared for the purposes of determining the existing wastewater treatment and disposal system's ability to handle anticipated growth, meet current and future anticipated regulatory requirements, and provide the City with a comprehensive planning document that outlines recommended wastewater system improvements. This WWFP Update outlines existing system deficiencies and provides the City with two improvement alternatives for the treatment system. The alternatives were developed with consideration of the current groundwater issues the City is facing due to the discharge of treated effluent into the percolation ponds, the associated groundwater quality impacts, and the possible permit requirements for indirect discharge. Alternatives were also developed to support the City's vision for the "Innovation Gateway," which will be discussed in further detail hereafter. This WWFP Update presents the wastewater system improvements needed for the City based on an evaluation of the system to efficiently and effectively treat projected wastewater flows and loadings to current and anticipated future water quality and permit requirements. Also, a key component of the planning project is the development of a financial plan for implementing the recommended improvements.

Scope

To meet the intentions and goals of this WWFP Update, the following scope was identified in the Agreement for Engineering Services:

- A statement of purpose, background, and need for wastewater facilities planning.
- A review and update of current wastewater flows and loads, as well as the 20-year projection of future population, wastewater flows, and waste loads. Updated design criteria will be developed.
- A review of the evaluation of the existing wastewater treatment system and an update of identified deficiencies based on the review.
- A review and update of the feasibility evaluation of the improvement alternatives presented in the 2010 WWFP and the addition of two new alternatives. These alternatives include year-round wastewater reuse through a hydroponic or similar consumptive use system and a lagoon treatment storage and agricultural irrigation system. Treatment standards and associated operational requirements for each alternative will be identified. Cost estimates will be developed and a cost effectiveness analysis of the alternatives over a 20-year period will be prepared. AP will work with Sustainable Water, which is developing the hydroponic reuse option to grow crops for human consumption. Sustainable Water will prepare the hydroponic reuse system conceptual design, construction cost estimates, and an operation and maintenance cost estimate, including estimated annual revenue from crop sales.
- An evaluation and detailed description of the City's preferred improvements alternative.
- An updated analysis of financing options and a review of the financing plan for viability for both construction and long-term operation, including projected sewer use charges.
- A preliminary environmental analysis, as required by the DEQ, to be included in a WWFP Update. Preparation of environmental reports for design and construction, funding applications, biological assessments, wetland delineations, cultural resource evaluations, mitigation plans, environmental permits, or other related environmental documents are not included.
- A written draft summary of the results of the updated planning effort. The draft summary will be presented to the City and applicable funding and regulatory agencies for review and comment.
- A final WWFP Update shall be presented to the City, Business Oregon, and the DEQ based on their review comments and input. Ten copies of the final WWFP Update shall be provided to the City, and one each to Business Oregon and the DEQ.
- A detailed collection system evaluation or an infiltration and inflow (I/I) study was excluded from the scope of this WWFP Update because the collection system is in good condition as a result of the collection system improvements made in 2009 and 2010, as identified in the 2010 WWFP. Refer to Chapter 3 for a description of the improvements and the general condition of the collection system.

Description of Community

The City of John Day is located approximately 1 mile north of Canyon City in Grant County at the intersection of U.S. Highways 26 and 395. The general location of the community is shown on Figure 1-1.

John Day was settled and founded in approximately 1862, when gold was discovered in Canyon Creek. The City was incorporated in 1901 and was named for John Day, a member of the Astor Expedition.

Initially, mining primarily drove the City's economy, with agriculture providing secondary community support. After mining subsided, agriculture and forest products became the primary community support. Currently, agriculture continues to be the primary economic driver for the area, with alfalfa being the principal crop. Cattle ranching is also prominent in the surrounding areas. One of Grant County's three remaining lumber mills (Malheur Lumber) is located just west of the city limits.

The population of John Day has fluctuated over time. During the period from 1960 through the present, the City's population fluctuated from a low of 1,520 in 1960 to a high of 2,012 in 1980. The July 2016 estimated population for the City was 1,735.

The City of Canyon City's population was also analyzed, because it shares the wastewater system with John Day. The July 2016 estimated population for Canyon City was 705. During the period from 1960 through the present, the City's population fluctuated from a low of 600 in 1970 to a high of 705 in 2016.

Study Area

The study area for this WWFP Update encompasses the entire area within the city limits and urban growth boundaries (UGB) of John Day and Canyon City. As mentioned, Canyon City is included because it shares the wastewater system with John Day. An illustration of the study area is shown on Figure 1-1.

Land Use

The City of John Day has adopted a Comprehensive Land Use Plan. The current zoning in the City is shown on Figure 1-2. According to the Comprehensive Land Use Plan, the current John Day city limits (and UGB) encompass an area of approximately 3,463 acres. Commercial areas are primarily located in the southeastern section of the City, in the downtown area along U.S. Highway 26 (John Day Highway). A large residential area is located exclusively on the south side of U.S. Highway 26 and in the northeastern section of the City. The City has two separate classifications for the industrial area: one is general industrial and the other is county industrial general. Both classifications are commingled and located on the north side of U.S. Highway 26, between the end of the downtown area and the west edge of the UGB. A large open space area is located south of U.S. Highway 26 that extends almost the entire length of the City, beyond the city limits but within the UGB.

Large undeveloped areas are present within the current city limits and UGB. These areas are mainly held for residential growth and open space with a minor amount designated for industrial growth.

Existing Wastewater System

The City of John Day's WWTF was first constructed in 1949. Major additions were completed in 1970 and 1978. Since 1978, the collection system has been expanded several times to support new growth. A general description of the wastewater system is provided hereafter.

The collection system is composed of approximately 84,145 lineal feet (LF) of gravity sewer pipe ranging from 4- to 18-inch diameter, approximately 10,528 LF of pressure sewer pipe ranging from 4- to 8-inch diameter, three lift stations, and manholes and cleanouts. In 2010, the City completed a collection system improvements project to address I/I sources identified in the 2010 WWFP. The WWTF generally consists of a wetwell, headworks, two primary clarifiers, two trickling filters, a secondary clarifier, a primary and secondary anaerobic digester, four sludge drying beds, a chlorine contact basin, and four percolation ponds. The WWTF and collection system are discussed in greater detail in Chapter 3.

WASTEWATER TREATMENT FACILITIES

T.13-14 S, R.31-32 E., W.M.

SCALE IN FEET

2400 0 2400

JOHN DAY

CITY LIMITS

CITY OF JOHN DAY URBAN GROWTH BOUNDARY

STUDY AREA

CANYON CITY

CITY LIMITS

CITY OF CANYON CITY URBAN GROWTH BOUNDARY

To Mt. Vernon

U.S. HWY. 395/26

U.S. HWY. 26

To Prairie City

To Burns

U.S. HWY. 395

PROJECT LOCATION

VICINITY MAP

Job# 592-25-020 Aug. 1, 2018 lbauer

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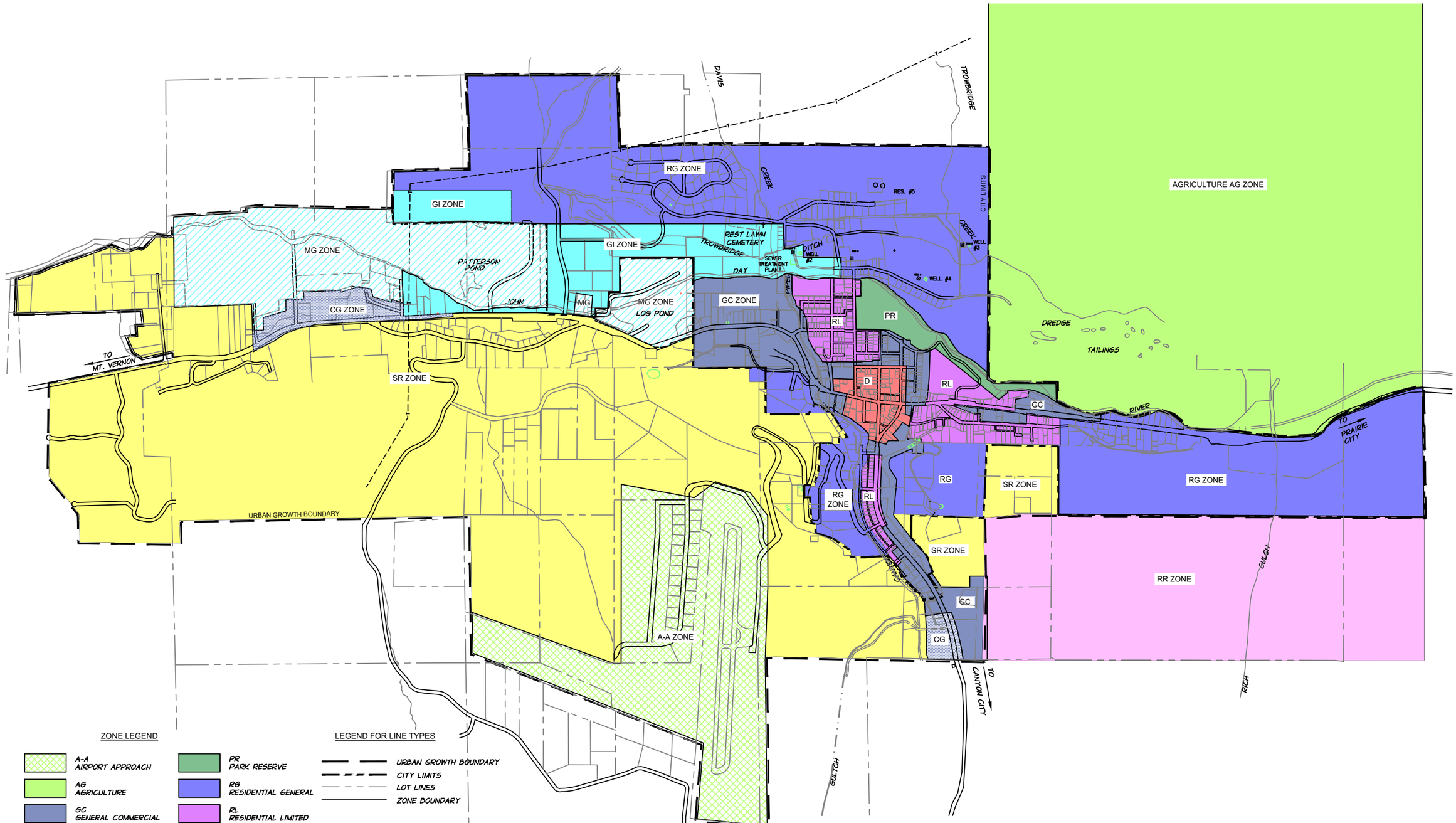
CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE

LOCATION AND VICINITY MAPS

FIGURE
1-1



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ZONING MAP

FIGURE
1-2

Chapter 2 - Basic Planning and Design Data

General

This chapter of the Wastewater Facilities Plan (WWFP) Update presents the basic planning and design data necessary to evaluate the City of John Day's existing wastewater collection, treatment, and disposal facilities. These data were used to determine the facilities' ability to serve the wastewater system needs of John Day (including Canyon City) for the selected planning period and to form the basis for evaluating alternatives for required improvements. First, population information and year 2038 population projections for the Cities of John Day and Canyon City are presented. This is followed by a summary of the historical wastewater data and the year 2038 design criteria used for this WWFP Update. Also, a discussion on treatment and regulatory agency requirements is provided.

Population

To estimate future wastewater system demands, population projections must be made. Projections are usually made on the basis of an annual percentage change estimated from past growth rates tempered by future expectations. Significant population fluctuations are typical in small communities as demonstrated by the population history of John Day. The addition of a major business, industry, or recreational facility in the community can dramatically affect the population. This being the case, it is difficult to accurately predict the population of a small community.

The population of the City of John Day was estimated to be 1,735 in 2018. Past population trends for the City of John Day, comparing data from 1960 through the present, show the population increased from 1,520 in 1960 to 1,735 in 2016, resulting in an average annual growth rate (AAGR) of 0.24 percent per year. Historical populations for the City of John Day are discussed hereafter and are shown on Table 2-1.

TABLE 2-1
HISTORICAL POPULATION - JOHN DAY

Year	Population	Average Annual Growth/Decline Rate (Percent)[1]	Population Change
1960	1,520	--	--
1970	1,566	0.3	46
1980	2,012	2.5	446
1990	1,857	-0.8	-155
2000	1,821	-0.2	-36
2010	1,750	-0.4	-71
2011	1,755	0.3	5
2012	1,745	-0.6	-10
2013	1,745	0.0	--
2014	1,745	0.0	--
2015	1,735	-0.6	-10
2018	1,735	0.0	--

[1]The time period between successive rows is variable. The AAGR is calculated based on the time span between each successive population shown.

The population of the City of Canyon City was estimated to be 705 in 2018. Past population trends for Canyon City, comparing data from 1960 through the present, show the population increased from 654 in 1960 to 705 in 2016, resulting in an AAGR of 0.13 percent per year. Historical populations for Canyon City are discussed hereafter and are shown on Table 2-2.

TABLE 2-2
HISTORICAL POPULATION - CANYON CITY

Year	Population	Average Annual Growth/Decline Rate (Percent)[1]	Population Change
1960	654	--	--
1970	600	-0.9	-54
1980	639	0.6	39
1990	648	0.1	-9
2000	669	0.3	21
2010	705	0.5	36
2011	710	0.7	5
2012	715	0.7	5
2013	705	-1.4	-10
2014	705	--	--
2015	705	--	--
2018	705	--	--

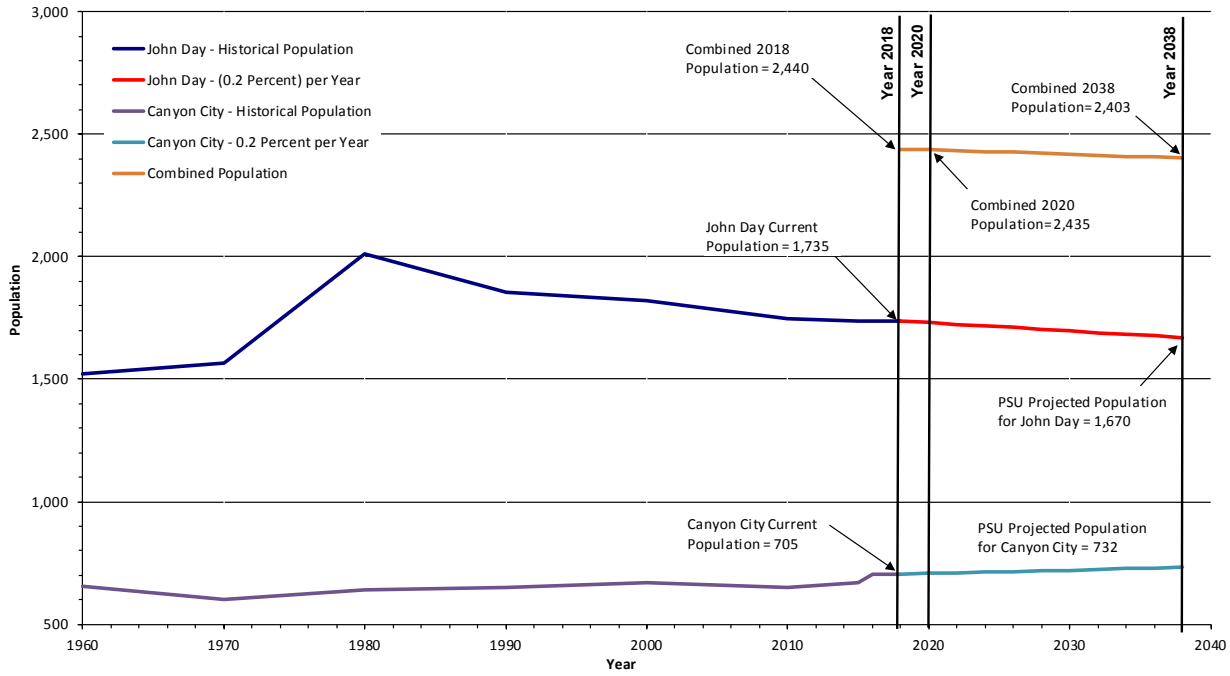
[1]The time period between successive rows is variable. The AAGR is calculated based on the time span between each successive population shown.

Projecting future population is difficult based on the erratic nature of the City's population history. Historically, the large fluctuation in population for the City of John Day has been due to the instability of the timber industry.

Population data for John Day and Canyon City were provided by the Population Research Center (PRC) at Portland State University (PSU). In accordance with the Oregon Department of Environmental Quality's guidance document "Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities," PSU is responsible for establishing and maintaining population forecasts for cities in Oregon. The PRC published the Coordinated Population Forecast for Grant County for years 2016 through 2066 and assigned an AAGR to the Cities of John Day's and Canyon City's urban growth boundaries between years 2016 and 2035 of -0.2 and 0.2 percent per year, respectively.

The City is anticipated to complete a wastewater system improvements project as early as 2020. Therefore, this WWFP Update will utilize John Day's 2018 estimated population projected to 2020 with a -0.2 percent per year as its design population. Canyon City's anticipated population in 2020 at a 0.2 percent per year growth rate will be added to John Day's estimated 2020 population to determine the overall design population. The population projections for John Day and Canyon City in 2020 and at the end of the planning period are shown on Chart 2-1.

CHART 2-1
HISTORICAL AND PROJECTED POPULATION - JOHN DAY AND CANYON CITY



For the purposes of this WWFP Update, the populations for both the Cities of John Day and Canyon City were added to determine the 2020 design population, as both communities utilize the wastewater treatment facility (WWTF). Therefore, the resulting design population for the City of John Day projected at -0.2 percent to 2020 is 1,728. Given the current population for Canyon City of 705 and a 0.2 percent AAGR, the projected population in 2020 would be approximately 707. Therefore, adding the populations of the communities results in a design population in 2020 of 2,435. It should be noted that the design population is less than the current population due to the required use of the PRC's population forecasts. The design population is carried through the WWFP Update and is used for sizing and developing cost estimates for future facilities. In the event the communities stay the same size or grow within the 20-year planning period, future facilities may be undersized to handle potential growth. Therefore, the City should plan accordingly, as this WWFP Update has no considerations for residential growth within the communities.

In addition, a new commercial/industrial allowance of 20,000 gallons per day (gpd) was added to the design criteria to account for possible future needs of the Innovation Gateway area, which is discussed in the Wastewater Flow Projections - Future Industrial and Commercial section below. It should be recognized, however, that over the planning period of this WWFP Update, the actual growth of John Day or Canyon City could either exceed or fall below the projected design population.

Historical Wastewater Data

This section provides a summary of the historical wastewater quality data for the City of John Day's WWTF. Information provided in this section was obtained from the City's discharge monitoring reports (DMRs), which include wastewater contributions from the City of John Day and the City of Canyon City. It should be noted that the City only records effluent flows from the WWTF. For this WWFP Update, it

has been assumed the effluent flows are equivalent to influent flows. Currently, wastewater flows originating from Canyon City are not monitored.

A summary of the historical flows including maximum daily flow, minimum daily flow, and the average monthly flow as recorded on the DMRs is shown on Figure 2-1. The recorded maximum daily flow, minimum daily flow, and average monthly flow were plotted for the period between January 2012 and December 2016. According to the data, the maximum daily flow occurred on April 28, 2012, and was 0.640 million gallons per day (MGD). The minimum daily flow occurred on October 13, 2015, and was 0.090 MGD. The average annual flow was 0.213 MGD during the same period or approximately 87 gallons per capita per day (gpcd). The maximum monthly wet weather flow was recorded in April 2012 and was 0.282 MGD.

Figure 2-2 summarizes historical influent and effluent five-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) concentrations as recorded on the DMRs during the period discussed above.

The maximum, minimum, and average influent BOD_5 concentrations were 325 milligrams per liter (mg/L), 172 mg/L, and 242 mg/L, respectively. The maximum, minimum, and average effluent BOD_5 concentrations were 26 mg/L, 6 mg/L, and 13 mg/L, respectively. According to the DMR data, the WWTF average BOD_5 mass loading was 429 pounds per day (lbs/day) and the WWTF removed an average of 94 percent of the BOD_5.

The maximum, minimum, and average influent TSS concentrations were 881 mg/L, 164 mg/L, and 303 mg/L, respectively. The maximum, minimum, and average effluent TSS concentrations were 29 mg/L, 6 mg/L, and 16 mg/L, respectively. The WWTF's average TSS mass loading was approximately 537 lbs/day. According to the data, the City's WWTF achieved an average TSS removal of 94 percent.

Figure 2-3 provides a summary of the historical flow and loading data shown on the DMRs. These data have been analyzed for establishing the future design criteria used in the evaluation of the wastewater treatment alternatives and the existing facilities.

Figure 2-4 shows a summary of the domestic effluent flow analysis for specific flow components of interest. The flow components have been separated into dry weather flow and wet weather flow categories.

Figure 2-5 is a summary of the City's historic wastewater data. Included in the summary are total, maximum, and average monthly influent and effluent flows. Additionally, Figure 2-5 presents the historical influent and effluent BOD_5, TSS concentration, and mass loading data.

The historical wastewater flows for the City of John Day are within the range that normally would be expected. Data collected from many domestic wastewater systems similar to John Day's indicate average annual flows (AAFs) usually range from 80 to 120 gpcd with small cities in eastern Oregon being on the lower end of this range. John Day's flow is approximately 87 gpcd (AAF). The infiltration and inflow (I/I) was evaluated by determining an average base flow and subtracting that from the AAF, which determined how much flow contribution may be attributed I/I.

Historical BOD_5 and TSS mass loadings are within the range that normally would be expected when compared with other domestic wastewater systems like John Day's. Typical BOD_5 and TSS per capita contributions range from 0.15 to 0.25 pounds per capita per day (lbs/capita/day) with a normal

contribution of approximately 0.2 lbs/capita/day. John Day's BOD_5 and TSS per capita loadings are in the range of 0.18 lbs/capita/day and 0.22 lbs/capita/day, respectively (see Figure 2-6). For design and evaluation purposes, these conditions for BOD_5 and TSS mass loadings will be used.

Design Criteria

Figure 2-6 summarizes basic wastewater design criteria developed for this WWFP Update. Figure 2-6 shows the year 2038 design population, design flows, and expected future influent wastewater strength characteristics. Figure 2-6 should be referred to during the review of subsequent chapters of this WWFP Update as it provides key information on which wastewater system alternatives were developed and evaluated.

Wastewater Flow Projections

Domestic

The total future anticipated domestic wastewater flows (AAF, average dry weather, average wet weather, maximum monthly, and maximum daily) were projected by adding the projected average base flow to the respective estimated I/I components for each flow. The average base flow is defined as the average of the minimum average monthly flows during the five years of available data (August 2012 - 0.184 MGD, October 2013 - 0.194 MGD, October 2014 - 0.185 MGD, October 2015 - 0.194 MGD, and November 2016 - 0.187 MGD). Based on the data, the average base flow is 0.189 MGD or approximately 77 gpcd. The 2020 average base flow is estimated using the current per capita base flow of 77 gpcd applied to the projected design population of 2,435. The average contribution from I/I for each flow component was estimated by taking the difference of each of the current total flow values and the current base flow (examples: AAF I/I contribution = current AAF flow - base flow = 0.213 MGD - 0.189 MGD = 0.024 MGD; average dry weather I/I contribution = current average dry weather flow - base flow = 0.201 MGD - 0.189 MGD = 0.012 MGD; etc.).

For projection purposes, it was assumed the current I/I flows experienced in the system would remain constant throughout the design period. Year 2020 I/I flows were not decreased for the following reasons:

- The nature of I/I corrective work in general is such that it is difficult to accurately predict future success.
- The magnitude of the City's I/I is such that results may not be seen for an extended period of time.

The U.S. Environmental Protection Agency (EPA) “Guide for Estimating Infiltration and Inflow,” dated June 2014, provides methods for analyzing WWTF influent data to estimate the I/I impact from the collection system. However, the data needed to follow the EPA methods for estimating base flow and I/I were not available nor does the City have the resources or equipment to collect the data needed. Therefore, the EPA requirements for estimating I/I cannot be met.

The EPA guidelines for I/I evaluations state that "no further infiltration/inflow analysis will be required if domestic wastewater plus non-excessive infiltration does not exceed 120 gallons per capita day (gpcd) during periods of high groundwater, and if the total daily flow during a storm does not exceed 275 gpcd, and there are no operational problems such as surcharges, bypasses, or poor

treatment performance resulting from hydraulic overloading of the treatment works during storm events."

The maximum daily flow of 640,000 gpd recorded on April 28, 2012, resulted in a per capita flow of 260 gpcd, which is lower than the 275 gpcd allowed by the EPA for total daily flow during a storm. The maximum average monthly flow was 282,000 gallons in April 2012, which equates to approximately 115 gpcd. It should be noted that the maximum daily flow recorded on April 28, 2012, is approximately 250,000 gallons more than the next highest maximum daily flow recorded in August 2014, as seen on Figure 2-1. This large fluctuation in maximum daily flow could be the result of an I/I point source repaired or removed from the collection system.

It does not appear that I/I is excessive in John Day's collection system and City operators do not suspect that I/I is a significant contributor to daily flows. However, an I/I evaluation could be of great benefit to the City. The identification of I/I sources and their removal from the system through manhole and pipeline repair could reduce the total volume of water the City must treat and dispose of. This reduction would provide a cost savings to the City.

Future Industrial and Commercial

The City of John Day is in the process of developing an area plan for a portion of the City to be known as the Innovation Gateway. Formerly the site of the Oregon Pine Mill and the City's existing WWTF, the Innovation Gateway area would potentially house the City's new WWTF that would support commercial-scale hydroponic greenhouses through water reuse. Construction of the first greenhouse is underway with plans to add additional greenhouses in the future. A portion of the development will be dedicated commercial property for a farmers' market, restaurant/microbrewery, and the City's Public Works Department.

To account for potential future commercial wastewater contributions from the Innovation Gateway, 20,000 gpd has been added to the future base flow and AAF I/I contribution to produce the anticipated future flows (example: AAF = base flow + I/I contribution + future industrial/commercial = 0.172 MGD + 0.043 MGD + 0.020 MGD = 0.235 MGD).

Mass Loadings

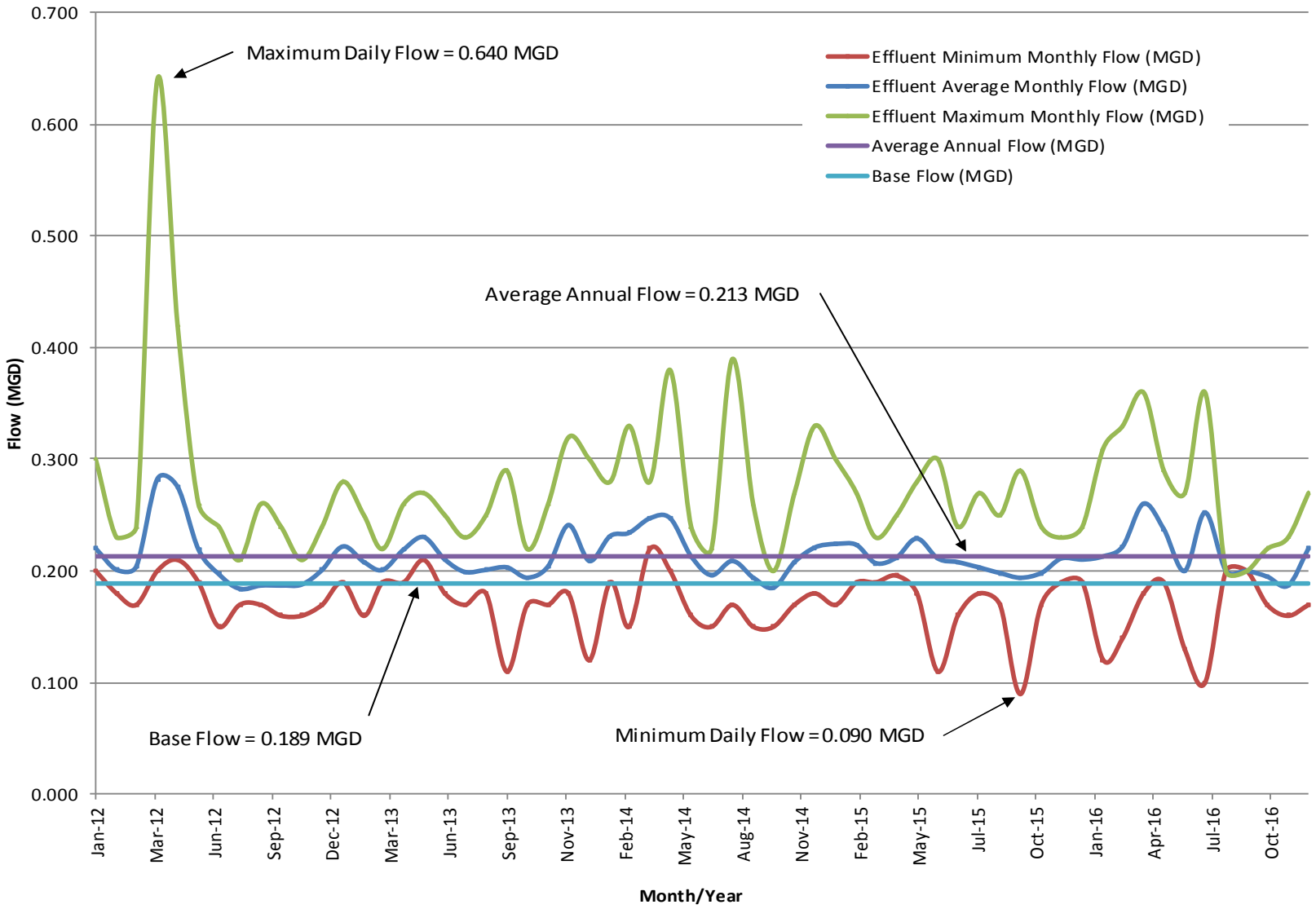
Domestic

The domestic design mass loadings (BOD_5, TSS, and total Kjeldahl nitrogen [TKN]) to the WWTF were estimated using the design AAF per capita BOD_5, TSS, and TKN contributions (refer to the Historical Wastewater Data section above) projected to the end of the 20-year planning period using the year 2038 design population of 2,467 (i.e., mass loading [BOD_5, TSS, or TKN] = contribution [BOD_5, TSS, or TKN], lbs/capita/day x 2,467). Using the design mass loading of 0.18 lbs/capita/day for BOD_5, 0.22 lbs/capita/day for TSS, and 0.01 lbs/capita/day for TKN yields a year 2038 domestic mass loading of 434 lbs/day of BOD_5, 543 lbs/day of TSS, and 32 lbs/day of TKN.

Future Industrial and Commercial

The future industrial and commercial mass loadings were assumed to be included in the domestic mass loadings rates. Since mass loadings are projected using the City's current mass loading rates

and the anticipated population during the design year 2020, mass loading rates were from domestic projections only.



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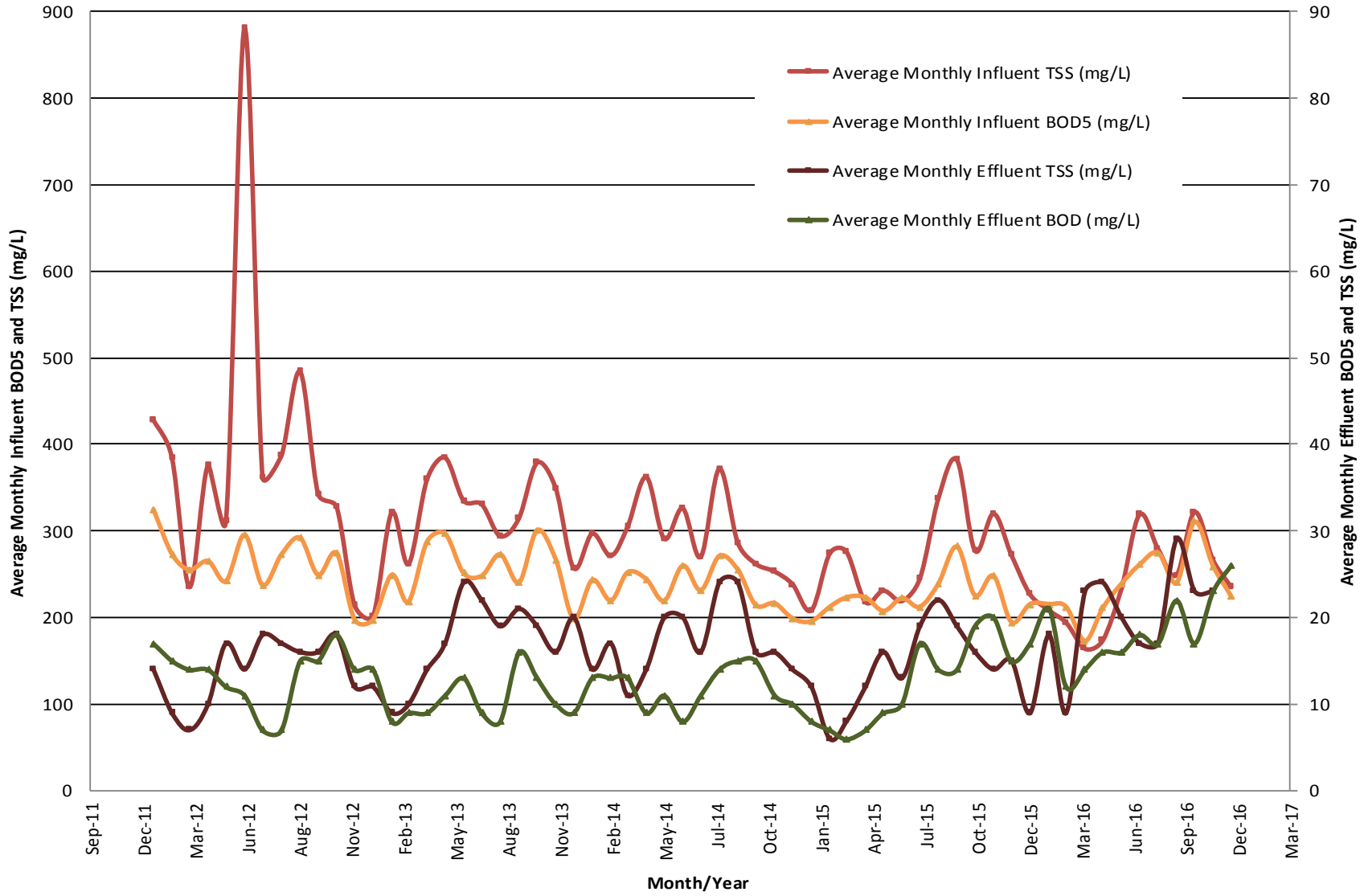
WASTEWATER FACILITIES PLAN UPDATE

HISTORICAL WASTEWATER FLOWS

FIGURE
2-1



BOD_5 = five-day biochemical oxygen demand
mg/L - milligrams per liter
TSS = total suspended solids

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WASTEWATER FACILITIES PLAN UPDATE
HISTORICAL BOD_5 AND TSS CONCENTRATIONS

FIGURE
2-2

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
SUMMARY OF DMR DATA

	Plant Effluent Flows				Influent Parameters				Effluent Parameters									Contact Basin
Date	Effluent Minimum Monthly Flow (MGD)	Effluent Maximum Monthly Flow (MGD)	Effluent Average Monthly Flow (MGD)	Total Effluent Monthly Flow (MG)	Average Monthly Influent BOD_5 (mg/L)	Average Monthly Influent BOD_5 Loading (lbs/day)	Average Monthly Influent TSS (mg/L)	Average Monthly Influent TSS Loading (lbs/day)	Average Total Kjeidahl Nitrogen (mg/L)	Average Nitrate/ Nitrate as N (mg/L)	Average Monthly Effluent BOD (mg/L)	Average Monthly BOD_5 % Removal	Average Monthly Effluent BOD_5 Loading (lbs/day)	Average Monthly Effluent TSS (mg/L)	Average Monthly TSS % Removal	Average Monthly Effluent TSS Loading (lbs/day)	Maximum Monthly pH	Maximum Daily Chlorine Residual (mg/L)
Jan-12	0.200	0.300	0.220	6.830	325	596	428	785	155.00	5.0	17	95%	31	14	97%	26	7.42	1.7
Feb-12	0.180	0.230	0.201	5.820	273	458	384	644			15	95%	25	9	98%	15	7.42	1.6
Mar-12	0.170	0.240	0.204	6.320	255	434	235	400			14	95%	24	7	97%	12	7.41	1.4
Apr-12	0.200	0.640	0.282	8.460	265	623	376	884	9.75	5.7	14	95%	33	10	97%	24	7.41	1.3
May-12	0.210	0.420	0.275	8.520	242	555	312	716			12	95%	28	17	95%	39	7.44	1.3
Jun-12	0.190	0.260	0.219	6.560	296	541	881	1,609			11	96%	20	14	98%	26	7.44	1.3
Jul-12	0.150	0.240	0.197	6.120	237	389	362	595	5.75	19.9	7	97%	12	18	95%	30	7.42	1.2
Aug-12	0.170	0.210	0.184	5.710	273	419	387	594			7	97%	11	17	96%	26	7.40	1.2
Sep-12	0.170	0.260	0.187	5.610	292	455	484	755			15	95%	23	16	97%	25	7.39	1.4
Oct-12	0.160	0.240	0.187	5.790	249	388	343	535	9.85	10.6	15	94%	23	16	95%	25	7.41	1.2
Nov-12	0.160	0.210	0.188	5.630	274	430	328	514			18	93%	28	18	95%	28	7.42	1.4
Dec-12	0.170	0.240	0.201	6.230	197	330	214	359			14	93%	23	12	94%	20	7.43	1.4
Jan-13	0.190	0.280	0.222	6.870	197	365	202	374	15.50	5.8	14	93%	26	12	94%	22	7.42	1.6
Feb-13	0.160	0.250	0.208	5.820	249	432	321	557			8	97%	14	9	97%	16	7.42	1.6
Mar-13	0.190	0.220	0.201	6.220	218	365	262	439			9	96%	15	10	96%	17	7.41	1.3
Apr-13	0.190	0.260	0.219	6.570	288	526	360	658	11.60	7.0	9	97%	16	14	96%	26	7.38	1.3
May-13	0.210	0.270	0.230	7.130	297	570	385	739			11	96%	21	17	96%	33	7.41	1.2
Jun-13	0.180	0.250	0.210	6.310	251	440	335	587			13	95%	23	24	93%	42	7.42	1.2
Jul-13	0.170	0.230	0.199	6.180	248	412	331	549			9	96%	15	22	93%	37	7.48	1.2
Aug-13	0.180	0.250	0.201	6.230	273	458	294	493			8	97%	13	19	94%	32	7.60	1.2
Sep-13	0.110	0.290	0.203	6.080	240	406	315	533	6.40	7.0	16	93%	27	21	93%	36	7.62	1.2
Oct-13	0.170	0.220	0.194	6.020	301	487	379	613			13	96%	21	19	95%	31	7.60	1.2
Nov-13	0.170	0.260	0.204	6.120	267	454	349	594	6.99	13.7	10	96%	17	16	95%	27	7.68	1.2
Dec-13	0.180	0.320	0.241	7.470	198	398	257	517			9	95%	18	20	92%	40	7.89	1.2
Jan-14	0.120	0.300	0.209	6.490	243	424	297	518	16.60	4.0	13	95%	23	14	95%	24	7.90	1.2
Feb-14	0.190	0.280	0.231	6.480	219	422	271	522			13	94%	25	17	94%	33	7.93	1.2
Mar-14	0.150	0.330	0.234	7.260	252	492	305	595			13	95%	25	11	96%	21	7.87	1.2
Apr-14	0.220	0.280	0.247	7.410	244	503	362	746	9.90	7.8	9	96%	19	14	96%	29	7.94	1.2
May-14	0.200	0.380	0.247	7.670	219	451	291	599			11	95%	23	20	93%	41	7.56	1.2
Jun-14	0.160	0.240	0.213	6.380	260	462	326	579			8	97%	14	20	94%	36	7.51	1.2
Jul-14	0.150	0.220	0.196	6.090	231	378	270	441	7.98	18.3	11	95%	18	16	94%	26	7.48	1.2
Aug-14	0.170	0.390	0.209	6.490	271	472	372	648			14	95%	24	24	94%	42	7.36	1.2
Sep-14	0.150	0.260	0.194	5.820	255	413	286	463			15	94%	24	24	92%	39	7.19	1.2
Oct-14	0.150	0.200	0.185	5.750	214	330	262	404	5.56	16.5	15	93%	23	16	94%	25	7.50	1.2
Nov-14	0.170	0.270	0.208	6.240	216	375	253	439			11	95%	19	16	94%	28	7.51	1.3
Dec-14	0.180	0.330	0.221	6.860	198	365	238	439			10	95%	18	14	94%	26	7.48	1.4
Jan-15	0.170	0.300	0.224	6.940	195	364	208	389	8.41	9.4	8	96%	15	12	94%	22	7.41	1.5
Feb-15	0.190	0.270	0.223	6.250	212	394	274	510			7	97%	13	6	98%	11	7.29	1.4
Mar-15	0.190	0.230	0.207	6.410	223	385	276	476			6	97%	10	8	97%	14	7.27	1.5
Apr-15	0.196	0.250	0.212	6.350	223	394	218	385	5.33	13.2	7	97%	12	12	94%	21	7.22	1.3
May-15	0.180	0.280	0.229	7.110	207	395	231	441			9	96%	17	16	93%	31	7.06	1.2
Jun-15	0.110	0.300	0.211	6.330	222	391	219	385			10	95%	18	13	94%	23	7.24	1.1
Jul-15	0.160	0.240	0.208	6.450	212	368	245	425	7.37	15.9	17	92%	29	19	92%	33	7.17	1.2
Aug-15	0.180	0.270	0.203	6.290	239	405	338	572			14	94%	24	22	93%	37	7.07	1.3
Sep-15	0.170	0.250	0.198	5.940	282	466	382	631			14	95%	23	19	95%	31	7.09	1.3
Oct-15	0.090	0.290	0.194	6.020	225	364	277	448	5.85	17.7	19	92%	31	16	94%	26	7.06	1.3
Nov-15	0.170	0.240	0.198	5.950	248	410	320	528			20	92%	33	14	96%	23	7.30	1.5
Dec-15	0.190	0.230	0.211	6.550	194	341	272	479			15	92%	26	15	94%	26	7.21	1.6
Jan-16	0.190	0.240	0.210	6.520	215	377	227	398			17	92%	30	9	96%	16	7.15	1.4
Feb-16	0.120	0.310	0.213	6.170	215	382	208	369			21	90%	37	18	91%	32	7.12	1.4
Mar-16	0.140	0.330	0.222	6.880	212	393	194	359			12	94%	22	9	95%	17	7.32	1.2
Apr-16	0.180	0.360	0.260	7.790	172	373	164	356			14	92%	30	23	86%	50	6.83	1.1
May-16	0.190	0.290	0.237	7.350	211	417	174	344			16	92%	32	24	86%	47	7.04	1.1
Jun-16	0.130	0.270	0.200	6.010	239	399	234	390			16	93%	27	20	91%	33		1.1
Jul-16	0.100	0.360	0.252	7.800	261	549	319	670			18	93%	38	17	95%	36	6.90	1.1
Aug-16	0.200	0.200	0.200	6.200	275	459	279	465			17	94%	28	17	94%	28	6.98	1.1
Sep-16	0.200	0.200	0.200	6.000	240	400	249	415			22	91%	37	29	88%	48	7.02	1.2
Oct-16	0.170	0.220	0.195	6.040	311	506	322	524			17	95%	28	23	93%	37	7.00	1.2
Nov-16	0.160	0.230	0.187	5.610	259	404	266	415			23	91%	36	23	91%	36	6.90	1.3
Dec-16	0.170	0.270	0.220	6.830	224	411	235	431	11.10	10.5	26	88%	48	19	92%	35	7.18	1.3
Maximum	0.220	0.640	0.282	8.52	325	623	881	1,609	155.00	19.9	26	97%	48	29	98%	50	7.94	1.7
Minimum	0.090	0.200	0.184	5.61	172	330	164	344	5.33	4.0	6	88%	10	6	86%	11	6.83	1.1
Average	0.170	0.275	0.213	6.49	242	429	303	537	17.58	11.06	13	94%	23	16	94%	29	7.36	1.3
Permit			0.600									85%						1.00

BOD_5 = five-day biochemical oxygen demand
lbs/day = pounds per day
MG = million gallons
mg/L = milligrams per liter
MGD = million gallons per day
TSS = total suspended solids

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WASTEWATER FACILITIES PLAN UPDATE

SUMMARY OF DMR DATA

FIGURE
2-3

EFFLUENT FLOW ANALYSIS SUMMARY[1]

	2012	2013	2014	2015	2016	Average
Dry Weather Flows (MGD)[2]						
Average Dry Weather Flow	0.194	0.202	0.201	0.202	0.206	0.201
Maximum Daily Dry Weather Flow	0.260	0.290	0.390	0.300	0.360	0.320
Minimum Daily Dry Weather Flow	0.150	0.110	0.150	0.090	0.100	0.120
Maximum Month Dry Weather Average Flow	0.219	0.210	0.213	0.211	0.252	0.221
Wet Weather Flows (MGD)[3]						
Average Wet Weather Flow	0.236	0.214	0.235	0.219	0.226	0.226
Maximum Daily Wet Weather Flow	0.640	0.280	0.380	0.277	0.293	0.374
Minimum Daily Wet Weather Flow	0.170	0.160	0.120	0.184	0.168	0.161
Maximum Month Wet Weather Average Flow	0.282	0.230	0.247	0.229	0.260	0.250

Notes:

[1] Effluent flows are measured and reported as influent flows on the City's DMRs. For the purposes of this analysis, it has been assumed that the two flows are equal and all minor losses are negligible.

[2] Dry weather flow data obtained from the months of June through November.

[3] Wet weather flow data obtained from the months of December through May.

DMRs = discharge monitoring reports
MGD = million gallons per day

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WASTEWATER FACILITIES PLAN UPDATE
EFFLUENT FLOW
ANALYSIS SUMMARY

FIGURE
2-4

SUMMARY OF HISTORICAL WASTEWATER DATA

	Influent	Effluent	
Flow Component			
Maximum Daily Flow (MGD)[1]		0.640	April 28, 2012
Minimum Daily Flow (MGD)[2]		0.090	October 13, 2015
Average Annual Flow (MGD)[3]		0.213	
Base Flow (MGD)		0.189	
Infiltration/Inflow (MGD)		0.024	
Loading Component			
Maximum Average BOD_5 (mg/L)[4]	325	26	
Minimum Average BOD_5 (mg/L)[5]	172	6	
Average BOD_5 (mg/L)[6]	242	13	
Average BOD_5 (lbs/day)[6, 7]	429	23	
Maximum Average TSS (mg/L)[8]	881	29	
Minimum Average TSS (mg/L)[9]	164	6	
Average TSS (mg/L)[9]	303	16	
Average TSS (lbs/day)[7, 10]	537	28	

Note: Flow components are based on the DMRs for the period of January 2012 to December 2016. Effluent flows are recorded as influent flows on the City's DMRs. It has been assumed the two flows are equal and all minor losses are negligible.

[1] Maximum daily flow is the maximum flow rate that occurred over a 24-hour period.

[2] Minimum daily flow is the minimum flow rate that occurred over a 24-hour period.

[3] AAF is the average flow rate occurring over a 24-hour period based on the total annual flow (i.e., total annual flow divided by 365 days). The design AAF is the average of all of the average annual flows for each year analyzed.

[4] Monthly maximum average BOD_5 concentration.

[5] Monthly minimum average BOD_5 concentration.

[6] Monthly average BOD_5 concentration.

[7] Mass loadings estimates based upon using AAF. Mass loading (lbs/day) = concentration, (mg/L) x AAF (MGD) x 8.34.

[8] Monthly maximum average TSS concentration.

[9] Monthly minimum average TSS concentration.

[10] Monthly average TSS concentration.

AAF = average annual flow
BOD_5 = five-day biochemical oxygen demand
DMRs = discharge monitoring reports
lbs/day = pounds per day
MGD = million gallons per day
mg/L = milligrams per liter
TSS = total suspended solids

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CITY OF
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WASTEWATER FACILITIES PLAN UPDATE
SUMMARY OF HISTORICAL WASTEWATER DATA

FIGURE 2-5

DESIGN CRITERIA

	EXISTING 2018[1]		DESIGN 2020[4]	
	I/I[2]	Total[3]	I/I[5]	Total[6]
Population		2,440[7]		2,435
Average Base Flow (ABF), MGD[8]	----	0.189	----	0.189
Per Capita Flow, gpcd	----	77	----	77
Industrial/Commercial Growth Allowance	----	----	----	0.020
Average Annual Flow (AAF), MGD	0.024	0.213	0.024	0.233
Per Capita Flow, gpcd	10	87	10	96
Average Dry Weather Flow (ADWF), MGD[9]	0.009	0.198	0.009	0.218
Per Capita Flow, gpcd	4	81	4	89
Average Wet Weather Flow (AWWF), MGD[9]	0.039	0.228	0.039	0.248
Per Capita, gpcd	16	93	16	102
Maximum Month Flow (MMF), MGD	0.093	0.282	0.093	0.302
Per Capita, gpcd	38	116	38	124
Maximum Daily Flow (MDF), MGD	0.451	0.640	0.451	0.660
Per Capita, gpcd	185	262	185	271
Peak Hour Flow (PHF), MGD[10]	----	0.959	----	1.047
Per Capita, gpcd	----	393	----	430
Average Influent BOD_5, mg/L[11]	----	242	----	221
lbs/day[11]	----	429	----	428
lbs/capita/day	----	0.18	----	0.18
Average Influent TSS, mg/L[11]	----	303	----	276
lbs/day[11]	----	537	----	536
lbs/capita/day	----	0.22	----	0.22
Average TKN, mg/L[11]	----	18	----	16
lbs/day[11]	----	32	----	32
lbs/capita/day	----	0.01	----	0.01

[1] Existing 2018 column based on a review of 2012 through 2016 data.
[2] The average contribution from I/I for each flow component (AAF, ADWF, AWWF, MMF, and MDF) was estimated by taking the difference of each of the current total flow values and the current base flow (example: average annual I/I contribution = current AAF - ABF = 0.213 MGD - 0.170 MGD = 0.043 MGD).
[3] Existing total flows and mass loadings are based on January 2012 through December 2016 DMR data.
[4] Population projected using a -0.2 percent growth rate for John Day and a 0.2 percent growth rate for Canyon City.
[5] For projection purposes, it was assumed the current I/I flows experienced in the system will remain constant throughout the planning period.
[6] Future total flow is estimated by taking the sum of the future ABF, I/I, and Industrial/Commercial Growth Analysis (example: AAF = 0.189 MGD + 0.024 MGD + 0.020 MGD = 0.233 MGD).
[7] Source: Population Research Center at Portland State University, July 1, 2018, Certified Estimate. Combined population for the City of John Day (1,735) and Canyon City (705).
[8] ABF is defined as the average of the minimum months between January 2012 and December 2016.
[9] ADWF and AWWF from Figure 2-4.
[10] Based on an assumed factor of 4.5 times the AAF.
[11] Existing data based on January 2012 through December 2016 DMR data.

BOD_5 = five-day biochemical oxygen demand
DMR = discharge monitoring report
gpcd = gallons per capita per day
I/I = infiltration and inflow
lbs/capita/day = pounds per capita per day
lbs/day = pounds per day
MGD = million gallons per day
mg/L = milligrams per liter
TKN = total Kjeldahl nitrogen
TSS = total suspended solids

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE

DESIGN CRITERIA

FIGURE 2-6

Chapter 3 - Existing Wastewater System Description and Evaluation

Introduction

This chapter of the Wastewater Facilities Plan (WWFP) Update provides an overview of the existing wastewater collection system and the wastewater treatment facility (WWTF). An evaluation of the WWTF was completed for purposes of determining its adequacy for meeting current and anticipated future permit requirements and the City's wastewater treatment needs for the 20-year planning period. Based on the evaluation, system deficiencies are identified.

Collection System Description and Evaluation

Construction of the original collection system began in 1949. Major additions were completed in 1970 and 1978. Since 1978, the collection system has been expanded several times to support the growing community.

The collection system consists of a single 18-inch interceptor and 6-, 8-, and 12-inch trunk and lateral lines that transport wastewater via gravity from residential and commercial developments of the Cities of John Day and Canyon City to the WWTF. The system consists of approximately 84,145 lineal feet (LF) of 4-, 6-, 8-, 10-, 12-, and 18-inch gravity sewer pipe. In addition, there are approximately 10,528 LF of 4-, 6-, and 8-inch forcemain. The collection system has 357 manholes and 34 cleanouts.

Three lift stations aid in the transportation of wastewater from low lying areas to the gravity collection system. One station located west of John Day, near the Grant County Road Department shops (County Lift Station), collects wastewater from the Grant County facilities and pumps it via a 4-inch forcemain to the Patterson Road Lift Station. The Patterson Road Lift Station is located next to the John Day River at the intersection of Patterson Road and U.S. Highway 395. This lift station collects wastewater from developments in the area and pumps it to the Bowling Alley Lift Station. The Bowling Alley Lift Station is located in front of the former bowling alley along U.S. Highway 395, east of N.W. Lyons Street. The Bowling Alley Lift Station collects the wastewater pumped from the Patterson Road Lift Station and a small gravity line. Wastewater from the Bowling Alley Lift Station is pumped into the gravity system at a manhole located near the intersection of W. Main Street and N.W. 3rd Avenue.

Through discussion with the City staff, the lift stations have been functioning well with no reported problems, and there were no foreseeable improvements needed. There are two submersible pumps located in wetwells at each lift station, each having the capacity to meet system demands. The pumps in the County Lift Station and the Bowling Alley Lift Station were replaced in 2004 with 7.5 horsepower, 460 volts. There was no information available on the Patterson Road Lift Station pumps, and obtaining pump and motor information would be difficult since the pumps are submersed in the wetwell. However, City staff indicated the pumps are working well with no issues to report.

The average daily flows for the Bowling Alley Lift Station, Patterson Road Lift Station, and County Lift Station are approximately 12,000 gallons per day (gpd), 5,000 gpd, and 1,500 gpd, respectively. Pump Run times for the Bowling Alley Lift Station, Patterson Road Lift Station, and the County Lift Station are

approximately 2 hours per day, 1 hour per day, and 0.5 hour per day, respectively. Typically, lift stations are designed with a peaking factor of approximately 3 to 4, depending on their location in the collection system. This means that, over the course of a normal day, pumps should operate for a total of no more than 6 to 8 hours. By using the estimated daily flows, the lift station run hours, and a maximum run time of 8 hours per day, the current and future capacity of the lift stations can be estimated. Theoretically, the Bowling Alley Lift Station, Patterson Road Lift Station, and County Lift Station are operating at 25 percent capacity, 12.5 percent capacity, and 7 percent capacity, respectively.

No overflows have been reported at any of the lift stations in the recent past, and each wetwell is equipped with transducers and float systems as backup. Each lift station is adequately sized to meet current demands and future system demands.

In 2009 and 2010, the City made improvements to the collection system to reduce infiltration and inflow identified in a video inspection completed as a part of the 2010 WWFP. The identified deficiencies repaired included infiltration point sources at pipe joints, service connections, and abandoned service connections; broken and cracked pipes; and root intrusions. The improvements have proved to be effective as indicated by the reduction in wastewater flows seen at the WWTF. The 2016 per capita average annual flow, per capita wet weather flow, and per capita maximum monthly flow were all reduced when compared to the 2010 design criteria. The biggest reduction can be seen in the maximum monthly flow, which went from 177 gallons per capita per day (gpcd) in 2010 to 116 gallons gpcd. That equates to a reduction of approximately 163,000 gpd. To view the entire collection system report, including identified deficiencies, video inspection reports, and collection system maps, refer to the City's 2010 WWFP. The collection system is reportedly in good condition based on the improvements made in 2009 and 2010. Therefore, a detailed collection system evaluation was not included in this WWFP.

Existing Wastewater Treatment Facility

Background

The existing WWTF is located on the northwestern end of John Day at the end of 7th Street. The City of John Day's existing WWTF provides secondary treatment of the City's domestic wastewater with a trickling filter. However, due to continued expansion of the system, the original trickling filter facility became overloaded, resulting in the need for an upgraded WWTF. In 1978, the WWTF was upgraded and incorporated several of the original structures from the 1949 WWTF. The current WWTF consists of a wetwell, an influent lift station, a headworks structure, two primary clarifiers, two trickling filters, one secondary clarifier, gas chlorination and chlorine contact basin, four percolation ponds for effluent disposal, primary and secondary anaerobic digesters, and four sludge drying beds. A site schematic of the existing WWTF is shown on Figure 3-1.

Site modifications have been made to the WWTF since 1978. The secondary clarifier has been retrofitted to include a chlorination line around the launder to reduce algae growth. In addition, a floating cover was installed on the secondary anaerobic digester. Other modifications include changes to telemetry, controls, flowmeters, and the distribution piping to the percolation ponds.

Existing Wastewater Treatment Facility Overview

The City of John Day's existing WWTF provides secondary treatment of the City's domestic wastewater. The WWTF generally consists of a wetwell, a preliminary treatment system

(headworks), a primary treatment system, a trickling filter secondary treatment system, secondary clarification, an anaerobic sludge digestion system, sludge drying beds, gas chlorine disinfection, a chlorine contact basin, and percolation ponds. Refer to Figure 3-2 for a process schematic of the existing WWTF.

Preliminary Treatment (Headworks)

Influent from the collection system enters into a wetwell where it is pumped to the headworks. The City of John Day's preliminary treatment consists of a grit removal, comminution, and a manually cleaned bar screen. The grit channel functions to remove incoming particles such as sand, gravel, eggshells, bone chips, coffee, and seeds. The comminutor functions to cut up (comminute) coarse solids to theoretically improve the downstream operations and processes and to help eliminate problems caused by the varied sizes of solids present in wastewater. The bar screen acts as an alternative method to prevent large debris from entering the WWTF in case the comminutor malfunctions. Large debris is suspended on the bar screen and manually removed. After passing through the headworks, the wastewater flows, via gravity, to the primary clarifier.

Primary Clarifiers

The objective of treatment by primary sedimentation (clarification) is to remove readily settleable solids and floating materials (scum) and, thus, reduce the biochemical oxygen demand and the suspended solids content of the wastewater. The incoming wastewater is directed to a center-feed well where the wastewater is distributed equally in all directions of the tank. The center-feed well provides an environment of limited agitation that helps create settleable flocculated solids and directs the flow equally toward the bottom center of the clarifier. Suspended solids settle and accumulate in the bottom of the tank. The clarifier is equipped with a slow-moving rotating sludge scraper located on the bottom of the tank that transports the settled sludge to a center hopper for withdrawal. Scum rises to the water surface in the clarifier and is prevented from flowing over the effluent weirs by a baffle ring installed on the periphery of the tank. A skimmer collects scum from the surface and directs the floating material to a scum trough where it is collected and periodically wasted to the anaerobic digester. The clarified effluent leaves the clarifier by flowing under the scum baffle and over a steel ring containing V-notch weirs, and into an effluent launder that runs along the entire periphery of the tank. Primary effluent flows by gravity to one of two 66-foot diameter trickling filters.

Trickling Filters

The wastewater flow enters a rotating distributor arm of the trickling filter and is distributed evenly over a 6-foot deep bed of rock media via nozzles strategically located on the arms. The organic material present in the wastewater is degraded by a population of micro-organisms attached to the filter rock media. Organic material from the liquid is adsorbed by the biological film or slime layer. In the outer portions of the biological slime layer, the organic material is degraded by aerobic micro-organisms. As the micro-organisms grow, the thickness of the slime layer increases, and the diffused oxygen is consumed before it can penetrate the full depth of the slime layer, resulting in an anaerobic environment near the surface of the media. As the slime layer increases in thickness, the adsorbed organic matter is metabolized before it can reach the micro-organisms near the media face. As a result of having no source of food available, the micro-organisms near the media face begin to consume their own protoplasm (endogenous growth phase) and eventually starve and lose

their ability to cling to the media. The liquid then washes the slime off the media, and a new slime layer starts to grow. This phenomenon of losing the slime layer is called "sloughing" and is primarily a function of organic and hydraulic loading on the filter. The hydraulic loading accounts for the scouring effect and the organic loading accounts for the rate of metabolism in the slime layer.

The treated wastewater containing the metabolic end products such as carbon dioxide, water, nitrates, sulfates, sloughed off material (humus), and other solids flows into the trickling filter underdrain system, which supports the media and permits air circulation. The trickling filter effluent flows via gravity to a second wetwell and is then pumped from the wetwell to either the secondary clarifier, back to one of the primary clarifiers, or back to a trickling filter, where it is further treated.

Secondary Clarifier

The secondary clarifier functions to remove floating scum, trickling filter humus, and other solids through gravity separation. The secondary clarifier is identical in design to the primary clarifier. The secondary sludge is periodically removed by gravity back to the first wetwell where it is combined with the raw influent. The combined raw influent and secondary sludge collected in the primary clarifier is periodically wasted to the primary anaerobic digester. As effluent flows out of the secondary clarifier, it is injected with chlorine just outside the effluent box. The chlorinated effluent then travels to a 28,000-gallon chlorine contact basin.

Chlorine Contact Basin and Percolation Ponds

The chlorine contact basin functions to allow adequate time for the chlorine disinfectant to contact bacteria in the wastewater and provide effective kill rates. The disinfected wastewater flows via gravity through the chlorine contact basin to a meter basin, then to one of four percolation ponds. The ponds allow the disinfected treated wastewater to be exposed to ultraviolet rays from the sun, which naturally provides dechlorination prior to percolating through the soil and into groundwater.

Sludge Pumping and Processing

Combined primary and secondary sludge and scum collected in the primary clarifier is periodically withdrawn. The combined sludge in the clarifier is pumped by a sludge pump, located in the operations building, to the primary anaerobic digester. The sludge is then pumped into a secondary digester.

The anaerobic digester functions to treat the primary and secondary sludge to provide a stable end product that can be safely and beneficially utilized as a soil amendment on the City's land application sites. The purpose of the digestion process is to reduce the volatile solids content in the waste sludge, thereby reducing the overall volume needing to be disposed of and minimizing the likelihood of vector (flies, rodents, etc.) attraction. Additionally, although not as easily achieved as vector attraction reduction, the digestion process functions to reduce the overall number of pathogens present in the biosolids. Significant reductions in the sludge volume occur as a result of biological breakdown of the volatile solids and through sludge thickening that takes place within the digester. Approximately 50 percent volatile solids destruction can be achieved in a well-designed and operated anaerobic digester.

Anaerobic digestion is a natural biological process that occurs in the absence of oxygen. Anaerobic digesters are typically designed as either "standard-rate" or "high-rate" single-stage or two-stage systems. The high-rate system differs from the standard-rate system primarily in that the solids loading rate is much greater, the sludge is intimately mixed, and it is heated to higher temperatures (95° to 100°F as compared to approximately 85°F in a standard-rate system) to achieve optimum digestion rates.

The most significant characteristics of the City's system are that two vessels are employed, and the contents in the digesters are heated to optimal digestion conditions and the primary digester is mixed. As such, the digestion process employed at the WWTF is a two-stage high-rate system.

The City of John Day has a functional sludge drying bed dewatering facility. The sludge drying beds consist of coarse sand and an underdrain system that discharges the water removed from the sludge back to the first wetwell of the WWTF. Currently, the City uses the beds during periods of the year when it is not possible to haul liquid sludge to the land application sites. Weather permitting, treated liquid sludge is directly withdrawn from the anaerobic digester and hauled by the City's liquid sludge hauling truck and land-applied.

Existing Wastewater Treatment Facility Evaluation

General

The unit process evaluation was undertaken to determine the adequacy of the existing WWTF to meet the current and future wastewater processing needs of the City of John Day. The evaluation used published and commonly accepted design criteria related to each unit. The design criteria shown on Figure 2-6 in Chapter 2 were also used extensively in the evaluation.

Preliminary Treatment (Headworks)

The City of John Day's headworks consists of an influent lift station, gravity grit removal, and comminution. The influent lift station collects all incoming wastewater and pumps it to the grit removal channels. The grit channels provide the means to remove a portion of the incoming small inert solids and the comminutor functions to cut up coarse solids to theoretically improve downstream operations and processes and to help eliminate problems caused by the varied sizes of solids present in wastewater.

The concrete on the wetwell needs to be rehabilitated to extend the service life of the concrete. The pumps located before the screen and comminutor regularly plug with wipes and other debris, resulting in continual maintenance. The City needs to replace the pumps with non-clog-type pumps to resolve the issue.

Currently, the comminutor is not functional, and a manually cleaned bar screen is the only method of preventing large debris from entering the WWTF.

The grit removal system being utilized by the City is outdated and the components have reached their design life. Updating or replacing the components is recommended.

The condition of the concrete of the existing headworks structure is very poor. The concrete walls of the structure are badly weathered and falling apart.

Due to the overall poor condition of the structure and the inadequacy of the preliminary treatment unit to provide efficient treatment, it is recommended a new headworks be constructed if the City decides to upgrade the existing WWTF. A number of configurations utilizing different treatment components (screening, grit removal, etc.) could be utilized in the upgraded headworks depending on the type of downstream treatment processes being employed. New headworks improvement options and recommendations are outlined in Chapter 4.

Primary Clarification

Primary clarifiers are designed mainly on the basis of surface overflow rate and detention time. The overflow rate is defined as the flow rate entering the clarifier divided by the surface area. Suitable overflow rates are dependent on the type of processes that are employed downstream. Typical design criteria for primary clarifiers followed by secondary treatment units such as trickling filters are shown on Table 3-1.

TABLE 3-1
TYPICAL DESIGN CRITERIA FOR CIRCULAR PRIMARY CLARIFIERS[1]

Design Parameter	Unit	Value	
		Range	Typical
Depth	feet	10 to 15	12
Average Overflow Rate	gal/ft^2/day	800 to 1,200	1,000
Peak Hour Overflow Rate	gal/ft^2/day	2,000 to 3,000	2,500
Weir Loading	gal/ft/day	10,000 to 40,000	20,000
Detention Time	hours	1.5 to 2.5	2.0

[1]Taken from Wastewater Engineering: Treatment and Reuse, Metcalf and Eddy, Inc., 4th Edition.
gal/ft/day = gallons per foot per day
gal/ft^2/day = gallons per square foot per day

The primary clarifiers are 34 feet in diameter and have an effective overflow area of approximately 800 square feet. The unit has an approximate side water depth of 10 feet. With a 10-foot depth, the clarifier has a volume of approximately 60,000 gallons. Referring to Figure 2-6 in Chapter 2, the existing average wet weather flow (AWWF) and estimated peak hour flow are 0.228 million gallons per day (MGD) and 0.959 MGD, respectively. Therefore, the current average overflow rate for one clarifier is 285 gal/ft^2/day and the existing peak hour overflow rate is approximately 1,199 gal/ft^2/day. Considering the design AWWF (year 2038) of 0.280 MGD and the peak hour design flow (2038 flow) of 1.192 MGD, the year 2038 average and peak hour overflow rates would be approximately 350 and 1,490 gal/ft^2/day, respectively. At the design AWWF, the detention time for one clarifier is approximately 5.1 hours.

Based on typical design criteria listed on Table 3-1, it appears that each clarifier has adequate capacity to handle current and anticipated design flows. Although the units appear to have sufficient capacity, the existing clarifier structures and equipment are almost 50 years old and in poor condition. Fifty years is beyond the expected design life of the structure and equipment. Severe cracks in the concrete and worn out equipment suggest the clarifiers are in need of

rehabilitation. Recommendations for upgrading or rehabilitating the primary clarifiers are discussed in further detail in Chapter 4.

Trickling Filters

Trickling filters are classified according to applied hydraulic and organic loadings. The hydraulic loading is the total volume of liquid, including recirculation, per unit time per square unit of filter surface area. Organic loading is the five-day biochemical oxygen demand (BOD_5), not including BOD_5 contained in recirculation, per unit time per cubic units of filter volume. Table 3-2 lists typical design criteria used for sizing rock media for trickling filters.

TABLE 3-2
TYPICAL DESIGN CRITERIA FOR TRICKLING FILTERS UTILIZING ROCK MEDIA[1]

Design Parameter	Unit	Trickling Filter Classification		
		Low-Rate	Intermediate Rate	High-Rate
Organic Loading	lb BOD_5/ 1,000 ft^3/day	4 to 14	15 to 30	25 to 150
Hydraulic Loading[2]	gal/ft^2/day	25 to 90	85 to 230	230 to 920
Media (Rock) Depth	feet	6 to 8	6 to 8	6 to 8

[1] Taken from Criteria for Sewage Works Design, Washington State Department of Ecology, revised October 1985, reprinted 1992.

[2] Includes recycled flow.

lbs = pounds
ft^3/day = cubic feet per day

The existing tricking filters are 65 feet in diameter and have an average media depth of approximately 6 feet. This is equivalent to a media volume of approximately 19,900 cubic feet per filter. A four-arm hydraulically driven distributor applies wastewater to the filter media surface through use of properly sized and spaced nozzles.

A number of models are available for use in estimating trickling filter performance. The model that is used in this WWFP Update to evaluate the performance of the trickling filter is the National Research Council (NRC) design equation.

The performance of the trickling filter using the NRC approach is dependent on the organic BOD_5 loading to the filter without regard to the BOD_5 in the recirculated flow, the volume of the media, the amount of recirculation, and the temperature of the wastewater. Recirculation is an important factor in the overall performance of the filter. Based on assessment (from several different published studies) of trickling filter installations, it appears the benefits of recirculation are due primarily to improved wetting and flushing of the filter media. By properly managing the hydraulic loading rate, it has been possible to maintain a thinner biomass layer consistently, with associated improvement in performance, and to avoid the periodic sloughing phenomenon often observed in most rock-type trickling filters. Table 3-3 is a summary of the trickling filter evaluation, including efficiency of the filter as related to hydraulic and organic loading and recirculation.

The process summary shown on Table 3-3 indicates the City's trickling filters appear to be adequately sized to handle the year 2038 design organic and hydraulic loadings. To obtain an overall BOD_5 removal of 85 percent by the WWTF (the minimum percent removal that would likely

be stipulated by the Oregon Department of Environmental Quality [DEQ] in the next permit cycle) the trickling filters must be capable of removing at least 79 percent of the incoming BOD_5, assuming 25 percent removal in the primary clarifier. Based on the process evaluation, it appears the filters would be able to consistently achieve the required 79 percent removal efficiency.

TABLE 3-3
TRICKLING FILTER EVALUATION SUMMARY[1]

Parameter	Without Recirculation		Theoretical Efficiency (Percent Removal)[2]		With Recirculation[3]		Theoretical Efficiency (Percent Removal)[2]	
	2018	2038	2018	2038	2018	2038	2018	2038
Organic Loading (lbs BOD_5/1,000 ft^3/day)[4]	16	16	81.6	81.5	16	16	85.1	85.0
Hydraulic Loading (gal/ft^2/day)	64	80	-------	-------	128	160	------	-------

[1] Based on the NRC equation.

[2] Efficiency at a wastewater temperature of 20°C. Percent Removal = percent BOD_5 removal

[3] Assumes a recirculation ratio, R = 1 (R = Recirculation Flow/Average Annual Flow)

[4] Assumes 25 percent removal of the BOD_5 in the primary clarifier.

As noted, each trickling filter has the organic and hydraulic capacity to handle current and projected wastewater flows. The west trickling filter was installed in approximately 1978 and appears to be in good condition. As the equipment, rock media, concrete, etc., are approximately 40 years old, it is recommended that key components be replaced or rehabilitated to decrease the potential for a major breakdown. It is recommended the City of John Day replace components such as spray nozzles, bearings, rock media, etc., if the WWTF is to be upgraded.

The east trickling filter is in worse condition than the west trickling filter. The east trickling filter was constructed in 1949 and contains many of the original components. Spalling concrete, corroded metal, and broken-down rock media are among issues. With the east trickling filter being approximately 70 years old and with noticeable degradation, it does not appear that it will be a reliable unit for the next 20 years. It is recommended that the east trickling filter be demolished and rebuilt if upgrades to the WWTF are pursued. Recommendations for the trickling filters are discussed further in Chapter 4.

Secondary Clarifier

As mentioned previously, the WWTF has one circular 34-foot diameter secondary clarifier. The clarifier has an approximate side water depth of 10 feet. The clarifier is a center-feed design with mechanical sludge scraper assemblies. The secondary sludge is withdrawn and recirculated to the influent lift station wetwell where it is pumped back into the headworks, is settled and combined with the primary sludge in the primary clarifier, then withdrawn and pumped to the anaerobic digester for processing.

A secondary clarifier design is commonly based on surface overflow rate and solids loading rates. Hydraulic loading criteria depend on the secondary treatment process used. The design criteria shown on Table 3-4 should be used for secondary clarifiers following trickling filtration.

TABLE 3-4
DESIGN CRITERIA FOR SECONDARY CLARIFIERS FOLLOWING TRICKLING FILTRATION[1]

Overflow Rate (gal/ft^2/day)		Solids Loading (lb/hour/ft^2)		Depth (feet)
Average	Peak	Average	Peak	
400 to 600	1,000 to 1,200	0.6 to 1.0	1.6	10 to 15

[1] Taken from Wastewater Engineering: Treatment and Reuse, Metcalf and Eddy, Inc., 4th Edition.
lb/hour/ft^2 = pounds per hour per square foot

At 600 gal/ ft^2/day average overflow rate, the hydraulic capacity of the secondary clarifier is approximately 480,000 gpd. Based on this calculation, it appears that the secondary clarifier is adequately sized to meet the current system demands and also the projected 2038 system demands. Even at the year 2038 AWWF of 280,000 gpd, the secondary clarifier has adequate capacity.

Although the capacity appears to be adequate to meet future needs, the clarifier is approximately 40 years old and has many noticeable cracks in the concrete and would need rehabilitation if the WWTF is going to be upgraded. Recommendations for the secondary clarifier are discussed further in Chapter 4.

Other important aspects that should be considered in evaluating the adequacy of the secondary clarifier facilities are redundancy and reliability. It is desirable to have at least two units, each with the capacity necessary to continue to provide the required treatment should one clarifier be off-line for repairs. Two clarifiers provide the necessary redundancy and reliability that would ensure consistent and ongoing compliance with the conditions of the Water Pollution Control Facilities (WPCF) Permit. John Day may use one of the primary clarifiers as a backup in an emergency situation; however, this is not a true form of redundancy and reliability for the secondary clarifier.

Chlorine Contact Basin

The secondary effluent is injected with chlorine and then flows into a chlorine contact basin. The chlorine contact basin is approximately 30 feet in diameter and has a 5-foot static water depth, giving a total volume of approximately 28,000 gallons and an effective volume of approximately 22,400 gallons, assuming 80 percent contact efficiency. At the existing AWWF of 228,000 gpd, the outfall provides approximately 2.4 hours detention. At the existing average dry weather flow of 198,000 gpd, the outfall provides approximately 2.7 hours detention. At the year 2038 design AWWF of 280,000 gpd, approximately 1.9 hours detention is provided by the chlorine contact basin. To achieve the required disinfection levels, at least 1 hour of detention needs to be provided.

The chlorine contact basin appears to have adequate capacity to meet the City's needs now and throughout the design period. Although the chlorine contact basin has the capacity, it is important to point out the chlorine contact basin was originally a clarifier and was later converted to be used as a contact basin. Because of the configuration and design of the contact basin, short-circuiting of the wastewater through the basin is likely happening. The chlorine contact basin is not effective,

and consequently requires high chlorine usage to get proper disinfection and meet the WPCF Permit limits. Due to the configuration of the basin and the apparent short-circuiting that may be occurring, it is recommended that the City of John Day replace the existing basin with a more effective unit. Recommendation for a chlorine contact basin is further discussed in Chapter 4.

Percolation Ponds

The City completed a wastewater system improvements project in 1978. As part of the 1978 improvements, four percolation ponds were constructed for the purposes of polishing the effluent from the WWTF and providing natural dechlorination via stripping and ultraviolet rays from the sun. The ponds have water surface areas of approximately 1.5 acres, a maximum water depth of approximately 2 feet, and a useable treatment volume of 970,000 gallons each. The design percolation rate is approximately 5 inches per day (actual percolation rates for each pond are not available). With a percolation rate of 5 inches per day and an approximate area of 1.5 acres, each pond is capable of discharging approximately 200,000 gpd into groundwater. Given the 2038 AWWF of 280,000 gpd, two of the four ponds have the capability to handle the flows. Based on this calculation, it appears the percolation ponds are adequately sized to meet current and future flows up to the end of the design period.

Although the percolation ponds are adequately sized for flows through the design period, the amount of nitrate being introduced to the groundwater as a result of seepage from the ponds has been excessive at times. To remedy this situation, in spring 2007 the City of John Day installed a discharge piping system that allows for more even distribution of wastewater in percolation ponds and eliminated the point discharge system that was being used. Also, the City stopped sending water to Pond 4 and began discharging effluent into Ponds 1, 2, and 3 simultaneously. Since these changes have been incorporated, the highest nitrate reading has been 4.0 milligrams per liter. Based on recent readings taken at the monitoring wells, it appears the new method of discharging to the ponds has helped reduce the nitrate levels in the monitoring wells by distributing the effluent over a larger infiltration area. Although it appears the nitrate levels have decreased values, it is not considered a long-term solution to the nitrate issue and it would be premature to say that the nitrate level issue has been resolved. Refer to Chapter 4 for more discussion on the nitrate concerns and recommendations for addressing the concerns.

Sludge Processing

Currently, the City processes the sludge in a two-stage high-rate anaerobic digester to a Class B level. The digested sludge is land-applied on DEQ-approved land application sites. Depending on the season and weather conditions, the digested sludge is either hauled in a liquid form directly from the digester via a tanker truck to the land application sites or wasted to drying beds for storage and dewatering.

The existing primary anaerobic digester is 20 feet in diameter and has a maximum side water depth of 15.5 feet. The total available treatment volume is approximately 36,400 gallons. The digester is equipped with a fixed cover, methane-fired boiler, an internal heat exchanger, and a fixed mixer mounted to the fixed cover.

The existing secondary anaerobic digester is approximately 20 feet in diameter and has a maximum side water depth of approximately 20 feet. The total available treatment volume is approximately

47,000 gallons. The digester is equipped with a floating gas cover and an external heat exchanger. The secondary digester is unmixed.

Anaerobic digester design is commonly based on a loading factor (pounds of volatile solids [VS] added per day per cubic foot of digester capacity), and detention time. Digestion tanks are also designed on a volumetric basis by providing a given amount of volume per capita (i.e., population basis of design). The design criteria shown on Table 3-5 should be used for high-rate digesters processing primary sludge and trickling filter humus.

TABLE 3-5
DESIGN CRITERIA FOR HIGH-RATE ANAEROBIC DIGESTERS
PROCESSING PRIMARY SLUDGE AND TRICKLING FILTER HUMUS[1]

Design Parameter	Unit	Range
Volume	ft^3 per capita	2.6 to 3.3
Solids Loading Rate	lbs VS per 1,000 ft^3 per day	100 to 200
Solids Retention Time	days	15 to 20

[1] Taken from Wastewater Engineering: Treatment and Reuse, Metcalf and Eddy, Inc., 4th Edition.
ft^3= cubic foot

The City's estimated 2018 sludge production is anticipated to be similar to what was reported in the 2010 WWFP. The reported sludge production is approximately 728 pounds of VS per day or a loading rate of 150 pounds of VS per 1,000 ft^3/day for the primary digester. Assuming the combined sludge can be thickened to a concentration of 4.0 percent solids, the combined thickened sludge wasting rate to the digester is approximately 2,776 gpd, which equates to a combined solids retention time in the primary digester of approximately 13 days. Based on the digester analysis, the anaerobic digester facilities do not have enough capacity to meet the current loading or the design loading.

The City of John Day has four drying beds. Each drying bed is 50 feet by 25 feet, for a total of 5,000 square feet for all four beds. Each drying bed has an available sludge storage depth of 1-foot. This equates to an available sludge storage volume of 9,350 gallons per bed or a total volume of 37,400 gallons. The sludge drying beds provide approximately 6 weeks of time to dry 1 foot of sludge, which is adequate during the summer and fall months. The drying beds have historically performed well primarily due to the geographic location of John Day. Typically, the City uses the two lower beds and the two upper beds are not normally used.

Wastewater Treatment Facility Process Summary

Based on the process evaluation, the City's WWTF is in need of improvements, regardless of whether any growth occurs in the John Day and Canyon City service areas. Several factors indicate improvements are needed.

Headworks

The influent pumps are old and need to be replaced as the City has been experiencing problems, and they are a continual high-maintenance item. Also, the pumps regularly plug with wipes and other debris. The wetwell concrete has deteriorated and needs to be rehabilitated to extend its life.

The comminutor is not functional and many of the components of the grit removal system are worn out and need to be replaced. Additionally, the concrete is cracking and is structurally in poor condition.

Primary Clarifiers

The structures are nearly 50 years old and cracking concrete is occurring, suggesting structural degradation of the units. Equipment is in need of replacement.

Trickling Filters

The east trickling filter is in poor condition. Concrete is spalling from the walls, steel components are corroding, there are cracks in the concrete, filter media is failing, etc. The unit is approximately 70 years old, and it does not appear that it will meet the long-term needs of the City. The west trickling filter is 40 years old and is in need of rehabilitation to meet long-term treatment needs.

Secondary Clarifier

The clarifier is structurally degrading based on observed cracks in the concrete. Equipment is in need of replacement. Redundancy and reliability issues exist in this aspect of the facility.

Chlorine Contact Basin

This system uses a high amount of chlorine due to it being a converted clarifier. The basin is functioning inefficiently.

Digesters

The anaerobic digester facilities are undersized and do not allow adequate detention time at existing loadings to achieve desired treatment levels.

Percolation Ponds

The City has experienced high nitrogen readings in its percolation ponds' monitoring wells in past years. It appears that continued discharge into the percolation ponds (apparent indirect discharge to the John Day River) will require a National Pollutant Discharge Elimination System (NPDES) Permit with more stringent discharge limits in the future.

Treatment and Regulatory Requirements

Presented hereafter is an evaluation of the regulatory requirements that may need to be met as part of implementation of the feasible alternatives presented in Chapter 4. These include regulations concerning groundwater quality protection, liquid treatment, wetland and waterway impacts, effluent reuse regulations, solids treatment, and sludge management. The City is currently compliant with WPCF Permit requirements.

The City of John Day's existing WWTF provides secondary treatment through the trickling filters with effluent disinfection and disposal through the percolation ponds. Discharge of treated effluent from the WWTF is regulated under a WPCF Permit (refer to Appendix A for a copy of the existing WPCF Permit

No. 102481). The WPCF Permit, issued in 2002, was authorized and is administered by the DEQ. The Permit expired on February 28, 2007. An application for renewal was made by the City to the DEQ on December 20, 2006. Although the WPCF Permit has expired, pursuant to Oregon Administrative Rule (OAR) 340-045-0040, the conditions outlined in the existing WPCF Permit still apply until a new permit is established.

No discharge to Waters of the State is permitted with the City's current WPCF Permit. However, the apparent hydraulic connection between the shallow groundwater of the John Day River and disposal through the percolation ponds could pose a permitting problem in the near future. If the City continues to discharge via the percolation ponds, it is assumed the DEQ will recognize the apparent hydraulic connection and regulate the City under NPDES Permit requirements or require the City to discontinue disposing wastewater through the percolation ponds. If an NPDES Permit is required, the City's existing WWTF is not capable of meeting the anticipated water quality requirements imposed by an NPDES Permit.

According to the Clean Water Act (CWA), switching from a WPCF Permit to an NPDES Permit would categorize the City as a new discharger. The Title 40 Code of Federal Regulations (40 CFR) 122.4 prohibits new dischargers if they may cause or contribute to the exceedance of water quality standards of the receiving stream. This means that issuing the City of John Day an NPDES Permit would trigger the renewal of the City of Mt. Vernon's and the City of Dayville's NPDES Permit limits and assign compliance schedules to meet total maximum daily loads and standards for the John Day River. For the City of John Day to be permitted as a new discharger, new waste load allocations for pollutants discharged would need to be established by the DEQ.

Groundwater Quality Protection

Current effluent limitations for the City of John Day's WWTF are given in the City's WPCF Permit. These limitations are based on groundwater quality protection rules for permitted operations as established in OAR 340-040 and the average dry weather design flow of 0.60 MGD.

Effluent Reuse Regulations

This section provides a general discussion of the effluent reuse regulations currently in place in Oregon. The criteria and guidelines for effluent irrigation and beneficial reuse summarized below are found in OAR, Chapter 340, Division 55 (OAR 340-055). OAR 340-055 does not specifically identify or exclude hydroponic reuse for crops grown for human consumption, which will need to be addressed while permitting the new WWTF.

- To assume groundwater protection, treated wastewater must be applied at agronomic rates. This refers to the practice of applying the treated wastewater at rates that are not in excess of what the crop being grown can use. This limitation applies to the hydraulic loading as well as the nutrient loading. For a typical municipal wastewater and a crop such as alfalfa, hydraulic loading will be the controlling factor.
- Typically pasture grasses, turf grasses, alfalfa crops, or other high water use crops are preferred as these crops have a relatively long growing season, a high consumptive use of water, and also consume fair amounts of nitrogen.

- Beneficial reuse applications vary significantly, depending on the treatment classification, and are discussed in more detail in Chapter 4.
- OAR 340-055 states that for irrigated land not under the direct control of a City, a contract is required between the City and the landowner.
- Depending on the wastewater classification, buffer zones surrounding the irrigation area will be required. Buffer zones for each wastewater classification are defined in OAR 340-055.
- A spray irrigation system that requires a minimal amount of physical handling is desirable. In this way, operators of the irrigation system will have limited contact with equipment that has been saturated with treated wastewater.
- Access to irrigation areas should contain signage informing people that treated wastewater is used on site and that it is not safe for human consumption. Access to irrigation areas utilizing Class D and Class C wastewater should be fenced to control public access.

Deep Well Injection Disposal Regulations

One wastewater disposal option available to the City is through a disposal well or underground injection control into a subsurface aquifer. The City would be required to perform testing on the proposed aquifer to establish existing water characteristics of the aquifer. According to OAR 340-044-0015, disposal of municipal wastewater into an underground source of drinking water is prohibited. Therefore, the disposal well would need to tap an aquifer not currently being used as a drinking source. The City would need to prove that the injection process does not introduce contaminants into groundwater that violate any primary drinking water regulation under the Safe Drinking Water Act or fails to comply with the groundwater protection requirements specified in OAR 340-040.

Sludge (Biosolids) Treatment and Management

As required by the CWA Amendments of 1987, the U.S. Environmental Protection Agency (EPA) developed a regulation to protect public health and the environment from reasonably anticipated adverse effects of certain pollutants that might be present in municipal sewage biosolids. This regulation, *The Standards for the Use or Disposal of Sewage Biosolids (40 CFR Part 503),* was published in the Federal Register (58 FR 9248 to 9404) on February 19, 1993, and became effective on March 22, 1993. The regulations that govern recycling and disposal of sewage biosolids in Oregon are contained in OAR 340-50 and follow 40 CFR Part 503.

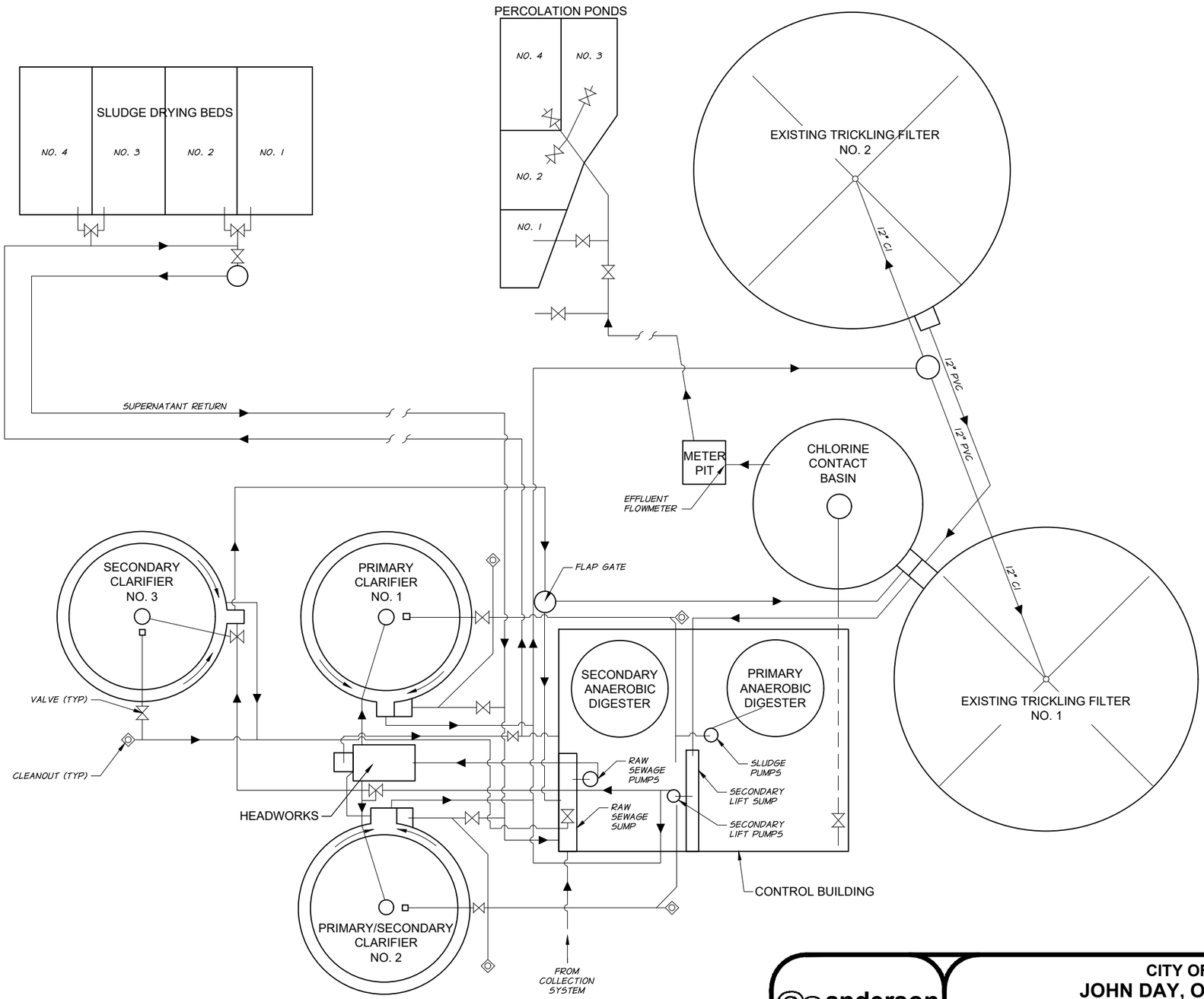
The provisions of the Part 503 Rule are consistent with EPA's policy of promoting beneficial uses of biosolids (refer to 49 FR 24358, June 12, 1984, for further information). Land application takes advantage of the soil conditioning and fertilizing properties of biosolids. The City is currently compliant with their Biosolids Management Plan dated March 14, 1988.

The Part 503 Rule includes five subparts: Subpart A - General Provisions, Subpart B - Requirements for Land Application, Subpart C - Surface Disposal, Subpart D - Pathogen and Vector Attraction Reduction, and Subpart E - Incineration. For each of the three use or disposal options (land application, surface disposal, and incineration), a Part 503 standard includes general requirements, pollutant limits, management practices, operational standards and requirements for frequency of monitoring, record keeping, and reporting. Since the City of John Day currently beneficially uses

their biosolids through land application, the only regulations pertaining to the City are Subparts A, B, and D, as Subparts C and E pertain to disposal and incineration of biosolids.

Part 503 separates biosolids into two classifications related to pathogen densities contained within the biosolids at the time of land application: "Class A" and "Class B." Class A biosolids have much more stringent requirements related to pathogen density levels than do Class B biosolids. Biosolids meeting Class A requirements can be sold in bags or bulk and applied on public areas such as lawns and home gardens. Class B biosolids are restricted to bulk application to agricultural land, rangeland, forest, public contact sites, or reclamation sites.

In Chapter 4, alternatives to improve the City's WWTF are developed and evaluated to address the deficiencies identified in this chapter.



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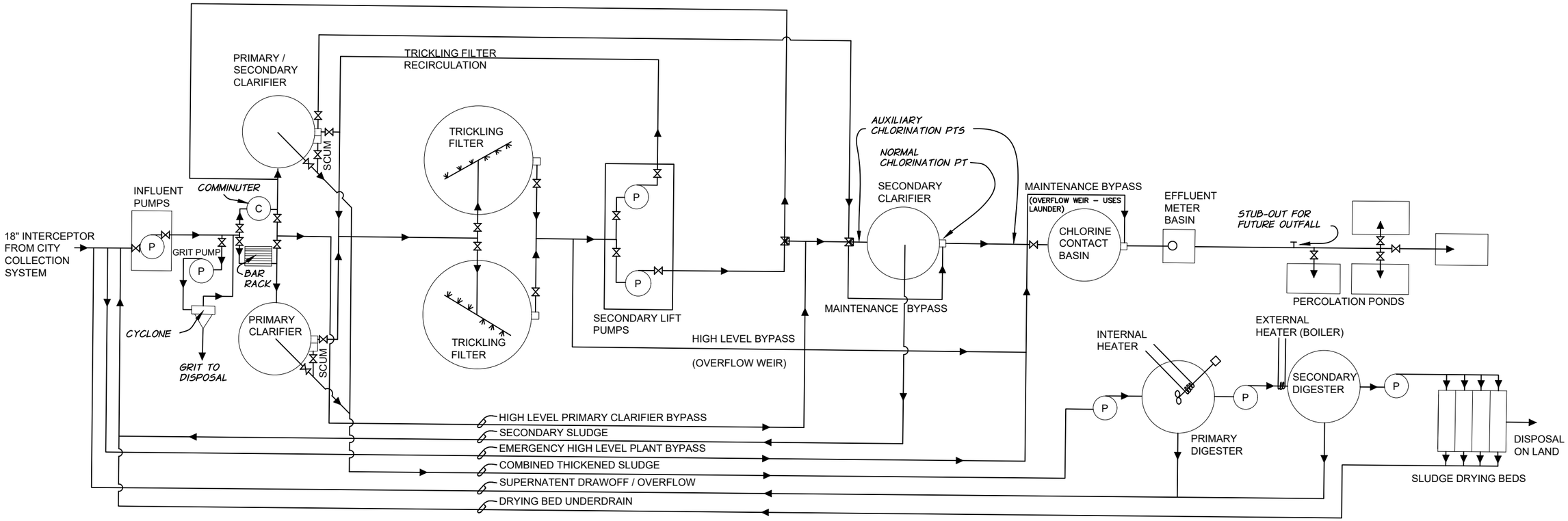
WASTEWATER TREATMENT FACILITY
EXISTING SITE PLAN

FIGURE
3-1

PLANT FLOW SCHEMATIC



DESIGN CRITERIA

DESIGN POPULATION

2,467 (20 YR)

DESIGN FLOW

MAX DAILY: 692,000 GPD

PEAK: 969,000 GPD

RAW SEWAGE PUMPS

1 - 300 GPM WITH ELECTRIC MOTOR
2 - 500 GPM WITH ELECTRIC MOTORS
1 - 700 GPM ENGINE DRIVEN EMERGENCY PUMP

PRIMARY CLARIFIERS

2 - 34 FT DIA x 10 FT SWD PERIFERAL FEED
(2ND UNIT CAN FUNCTION AS SECONDARY CLARIFIER)
OVERFLOW RATE AT DESIGN FLOW w/ ONE CLARIFIER:
600 GAL / SF / DAY

TRICKLING FILTERS

2- 65 FT DIA x 6 FT ROCK DEPTH
NATIVE ROCK MEDIA
MIN FLOW RATE: 300 GPM EA
MAX FLOW RATE: 850 GPM EA
MIN RECIRC RATE: 800 GPM

SECONDARY LIFT PUMPS

2 - 300 GPM
2 - 500 GPM

SECONDARY CLARIFIER

1- 34 FT DIA x 10 FT SWD
PERIFERAL FEED

CHLORINE CONTACT BASIN

1 - 30 FT DIA x 5 FT SWD WITH MECHANICAL SCRAPER
TOTAL VOLUME = 28,000 GAL
DETENTION TIME = 67 MIN AT 600,000 GPD FLOW RATE

ANAEROBIC SLUDGE DIGESTION

PRIMARY DIGESTER HEATED AND MIXED 20 FT DIA x 15.5 FT SWD
VOLUME = 5000 CF
SECONDARY DIGESTER WITH GAS HOLDER FLOATING COVER.
20 FT DIA x 20 FT SWD
VOL = 6300 CF
DRYING BEDS: 4 BEDS, 1250 SF EACH

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WASTEWATER TREATMENT FACILITY PROCESS FLOW SCHEMATIC

FIGURE 3-2

Chapter 4 - Development and Evaluation of Wastewater Treatment Facility Improvement Alternatives

General

In this chapter, alternatives to improve the City of John Day's wastewater treatment and effluent reuse/disposal facilities are developed and evaluated to address the deficiencies identified in Chapter 3. The wastewater collection system was not evaluated as part of this Wastewater Facilities Plan (WWFP) Update. A conceptual discussion of the treatment and effluent disposal alternatives considered in this WWFP Update are presented. Feasible alternatives deserving further consideration are identified, and further discussion and evaluation of the feasible treatment alternatives and effluent disposal and reuse options are provided. Based on comparison of the feasible alternatives, a recommended improvements package is presented. Selected improvements are detailed further in Chapter 5.

Wastewater Treatment Facility Alternatives and Effluent Reuse/Disposal Options

In this section, wastewater treatment facility (WWTF) alternatives and effluent reuse/disposal options are discussed. The City's existing WWTF has served the City effectively for many years. However, as discussed in Chapter 3, the existing WWTF has many important components that have deteriorated beyond repair, surpassed their design life, lack the capacity to meet current and/or future demands, or lack the capability of meeting potential future permit requirements. Therefore, upgrading the existing WWTF is not considered in the discussion of WWTF alternatives. The treatment and effluent reuse alternatives deemed to be feasible are evaluated in further detail prior to outlining the recommended improvements.

In the event the Oregon Department of Environmental Quality (DEQ) requires the City to obtain a National Pollutant Discharge Elimination System (NPDES) Permit or requires them to discontinue discharging to the percolation ponds due to the apparent hydraulic connection to the John Day River, the City of John Day would need to make significant changes to the WWTF. Several alternatives are available to the City to improve their discharge method and/or meet regulatory compliance with an NPDES Permit. This chapter presents, develops, and analyzes wastewater treatment alternatives and disposal improvement options for the City.

Conceptual Discussion of Wastewater Treatment Facility Alternatives

Four WWTF alternatives were considered and are conceptually evaluated in this WWFP Update:

- No Action Alternative
- Alternative A - New Wastewater Treatment Lagoon System
- Alternative B - New Mechanical WWTF
- Alternative C - New Wastewater Treatment Lagoon System and Mechanical WWTF

A brief description of each conceptual alternative follows.

No Action Alternative

Under the No Action Alternative, the City would continue to use the WWTF in its current condition and continue to discharge treated effluent into the percolation ponds. Refer to Chapter 3 for a comprehensive discussion of the existing WWTF. No work would be performed on the City's wastewater treatment system.

As discussed previously, the apparent hydraulic connection between the percolation ponds and the John Day River is a concern. In the event the DEQ requires the City to obtain an NPDES Permit, the existing WWTF process does not have the ability to meet the regulatory requirements for indirect discharge to the John Day River. Furthermore, based on the evaluation completed on the existing WWTF, some of the treatment units are of inadequate capacity to accommodate existing and anticipated future flows and loadings, and the majority of the components and equipment have reached or are nearing their useful design life. Consequently, the No Action Alternative is not considered to be a long-term viable option.

Alternative A - New Wastewater Treatment Lagoon System

With this alternative, the existing WWTF would be demolished and a pumping system and pipeline to a new non-discharging facultative lagoon system would be constructed to treat effluent and store reclaimed water for reuse as irrigation of crops for non-human consumption. The new WWTF would consist of preliminary treatment (screening and grit removal), two lift stations, an 8-inch forcemain, a two-cell lagoon system, chlorine disinfection system, and irrigation area.

The water balance developed for Alternative A is shown on Figure 4-1. According to the water balance, the City would need to construct approximately 33 million gallons (MG) of storage on an approximately 30-acre site with an irrigation area of approximately 45 acres to meet the design criteria developed in Chapter 2. The lagoon system would consist of a treatment lagoon, approximately 10 acres in size, and a storage lagoon approximately 20 acres in size. The treatment and storage lagoons would both have impoundment dikes approximately 10 feet deep. The treatment lagoon would have a maximum water depth of 7 feet, leaving 3 feet for freeboard. The treatment lagoon would maintain a minimum water depth of 3 feet at all times for treatment purposes, leaving the remaining 4 feet for additional treatment and operational storage. The storage lagoon would have a maximum water depth of 7 feet. Water depths would fluctuate throughout the year. The lagoon could be lined with on-site materials if the clay content is high enough; otherwise, a mixed-blanket bentonite or a geosynthetic liner would be utilized.

The location of the lagoon system and irrigation area will affect project costs due to the distance and elevation difference between the City and a suitable site. During development of this WWFP Update, one site was conceptually evaluated for the lagoons and irrigation area, which is located on a canyon shelf approximately 2-1/2 miles and 900 feet up in elevation north of the City. This location has on-site clay, which should be suitable for use as a liner. To convey the maximum daily flows from the City to the proposed site, an 8-inch forcemain and two lift stations in series would need to be installed.

Alternative A would allow the City to maintain its existing Water Pollution Control Facilities (WPCF) Permit and discontinue the apparent indirect discharge to the John Day River through the percolation ponds. The main difficulty associated with Alternative A is acquiring a suitable amount of land from a landowner close to the City of John Day to construct the new WWTF and irrigation area. Preliminary discussions with local landowners have resulted in no viable sites. Due to the fact that a property has

not been identified, Alternative A is not a viable alternative for treating and disposing of the City's wastewater. However, a conceptual site plan of what Alternative A could look like is shown on Figure 4-2.

Cost

The estimated project cost for Alternative A is approximately $5,805,000 and is shown on Figure 4-3. The cost estimate was prepared assuming a landowner and site were located by the City.

Advantages

The advantages to Alternative A are:

- Discontinues use of the percolation ponds and alleviates concerns surrounding the apparent hydraulic connection to the John Day River.
- Land application is a proven and accepted method of effluent disposal.
- Maintains the WPCF Permit.
- Future NPDES Permit discharge limits would not apply.
- Most cost-effective alternative.

Disadvantages

The disadvantages to Alternative A are:

- Land acquisition or condemnation is needed.
- No viable landowners have been identified.
- Facilities are located miles from the City, making access and operations a challenge.
- Crop management is needed.
- Improvements cannot be phased for installation over time.
- Farming practices are limited to crops not for human consumption.
- Does not meet the City's long-term planning goals/or commercial/industrial reuse of water.

Alternative B - New Mechanical Wastewater Treatment Facility

With this alternative, a new mechanical WWTF would be constructed at a new site to allow for development of the property at the existing WWTF to meet the City's current planning efforts involving the Innovation Gateway. The existing percolation ponds could potentially be reused for wastewater disposal depending on permitting. Otherwise, the existing WWTF would be demolished.

The mechanical WWTF would be capable of producing Class A or B effluent. The mechanical WWTF would generally consist of a new preliminary treatment system (screening and grit removal), an influent lift station, a membrane bioreactor (MBR) package facility, disinfection system, biosolids treatment and disposal, electrical, controls, and instrumentation, process and yard piping, etc.

Preliminary Treatment

The preliminary treatment (headworks) would consist of fine screening to remove plastics, rags, etc., essential to protecting the treatment equipment from excessive wear and plugging. The headworks would also be equipped with a grit removal system and an influent flowmeter.

The new mechanical treatment process would require preliminary treated wastewater to be pumped into the system via an influent lift station. The lift station would be capable of handling the anticipated design peak flows with built-in redundancy and reliability.

Secondary Treatment

The MBR package facility (secondary treatment) is a turn-key operation that contains all the components necessary for wastewater processing, including tanks, pumps, valves, blowers, mixers, flowmeters, and the membranes. The prefabricated unit would be constructed of stainless steel tanks that withstand the harsh chemical environment created in the treatment process.

As preliminary treated wastewater enters the MBR, it is cycled through an equalization basin to regulate flow and prevent overloading during peak flow events. From the equalization basin, effluent enters the anoxic (low oxygen) tank where it is mechanically mixed. Effluent is then gravity-fed into the aeration tank where oxygen is injected through air diffusers and a biological reaction occurs, breaking down the organic products.

After aeration, the effluent is filtered through the membranes. Membranes are composed of different materials and configurations, but all allow the passage of only specific components and the separating of fluid and solids. This treatment process can be easily modified if regulatory requirements become more stringent.

Biosolids Treatment and Disposal

Sludge (biosolids) is a byproduct derived from the wastewater treatment process and must receive additional treatment for proper disposal. Two methods to treat and dispose of biosolids are being considered in this WWFP: aerobic digestion and composting.

Similar to wastewater classifications, sludge processing has different levels of treatment requirements (refer to Chapter 3 for more information on the regulatory requirements). Biosolids treatment classifications must meet either Class A or Class B requirements, the difference being more stringent biosolids stabilization and vector attraction reduction is needed to meet the Class A requirements.

Aerobic Digestion System

To meet the criteria for Class B quality biosolids with aerobic digestion, the digesters must be sized to provide between 40 and 60 days of solids retention time depending on temperatures within the digesters. The average design solids production is estimated to be approximately 728 pounds of volatile solids per day. It is estimated that the solids would be wasted out of the MBR system at approximately 0.8 percent solids. To reduce the aerobic digester volume and demands from the blower equipment, the sludge would be processed through a polymer

injection system and sludge thickening equipment to increase the solids concentration to approximately 4 percent solids. At this rate of solids production and concentration, the sludge wasting rate from the treatment process into the digestion system would be approximately 2,200 gallons per day (gpd). It can be expected that approximately 30 to 40 percent of the incoming solids to the digestion system would be volatile, and at a minimum 30 percent reduction of the volatile solids would occur. Given these assumptions, sludge would accumulate in the tanks at a rate of approximately 2,000 gpd. Therefore, with the 60 days of solids retention time needed to meet the Part 503 regulations for Class B sludge, the amount of digester working volume that would be needed is approximately 120,000 gallons (digester working volume = 60 days x 2,000 gpd = 120,000 gallons). A minimum of two digesters would need to be constructed.

Sludge dewatering is needed to provide efficient handling of the waste digested sludge (biosolids). It is proposed to include a screw press and associated polymer feed system that would provide sludge dewatering capability to achieve dewatered sludge concentrations of 15 to 20 percent dry solids. This would allow efficient storage and transport of the solids for disposal.

Compost Facility

To reduce capital costs of the mechanical treatment facility, a compost facility is being proposed in lieu of aerobic digestion. Biosolids generated through the secondary treatment process would undergo thickening via polymer injection and dewatered to ease transport of biosolids to the compost facility. Additionally, biosolids processing at the mechanical treatment plant would need to be isolated, so odor control equipment could be installed to minimize odors and to improve the air quality.

The compost facility would be located away from the new mechanical treatment facility and away from the public to minimize the odor nuisance associated with composting volatile solids. The compost facility would consist of an uncovered impermeable surface approximately 5,000 square feet in area equipped with a collection and reuse system to manage precipitation and prevent groundwater and/or soil contamination from the biosolids filtrate. In addition to the water collected from the collection system, an additional water source would be needed to maintain the proper water content in the biosolids during the treatment process.

To achieve adequate biosolids stabilization and vector attraction reduction to meet Class A requirements, the temperature of the biosolids must be maintained at 55°Cfor 15 days. Additionally, the compost pile must be turned five times during the 15-day period. Requirements for Class B biosolids are that temperatures be maintained at 40°C or higher for five days. For four hours during the five days, the temperature in the compost pile must exceed 55°C. An extensive monitoring and reporting program would need to be developed and maintained by the City if either a Class A or Class B biosolids compost facility is pursued.

The equipment needed for the compost facility would consist of a skid steer equipped with a mixing device to turn the biosolids as needed to meet regulatory requirements and introduce a carbon source (i.e., saw dust or wood chips) to feed the microbes involved in the biological process. Other equipment needed would be a trommel screen to remove the carbon source for reuse. Once the carbon source is removed, the biosolids can be stockpiled or disposed of via

regulatory agency-approved methods. The mechanical treatment plant is expected to produce approximately 3 cubic yards of biosolids daily. Therefore, a 10-cubic yard dump truck would be needed to transport biosolids from the mechanical treatment plant to the compost facility.

Effluent Disposal/Reuse and Wastewater Treatment Facility Permitting

Secondary treated wastewater produced from the mechanical treatment plant would undergo disinfection via ultraviolet light prior to disposal/reuse. It is anticipated that the DEQ will allow the City to continue to discharge treated wastewater into the percolation ponds through an administrative extension of the current WPCF Permit until a new permit can be issued and another disposal method identified.

Construction of a new mechanical WWTF would provide the City with the means to consistently and effectively exceed the existing WPCF Permit requirements and meet or exceed potential future NPDES Permit requirements. The mechanical WWTF could be designed with the ability to biologically remove nutrients (nitrogen and phosphorus) and metals (iron, copper, and lead), if required, which would alleviate concerns with indirect or direct discharge into the John Day River.

In the event direct discharge to the John Day River is permitted, the DEQ would need to revise the John Day River's waste load allocations, recognizing John Day as a new discharger. Currently, the John Day River's waste load allocations are assigned for the City of Mt. Vernon and the City of Dayville only. A mixing zone study would need to be performed due to the City of John Day's new outfall to the John Day River. The mixing zone study would evaluate the dispersion, mixing, and dilution of the discharged effluent within the assigned mixing zone boundary.

Reuse options currently available to the City consist of irrigating the Class A effluent at City parks, greenways, ball fields, and the golf course; greenhouse heating and cooling, hydroponic crop demands, torrefaction process water, and potential log deck watering at Malheur Lumber. Descriptions and preliminary cost estimates for the different reuse/disposal methods available to the City are presented in detail hereafter.

Summary

Given the above considerations, it is evident that a new mechanical WWTF is a viable alternative available to the City. A conceptual site plan and process schematic of Alternative B showing the mechanical treatment plant with aerobic digesters is shown on Figures 4-4A and 4-4B, respectively.

Cost

The total estimated project cost for Alternative B including aerobic digestion is approximately $10,537,000 and is shown on Figure 4-5A. The total estimated project cost for Alternative B including a compost facility is approximately $9,330,000 and is shown on Figure 4-5B. Disposal/reuse options for Alternative B are discussed in depth hereafter; however, additional costs will be incurred above what is proposed on Figures 4-5A and 4-5B depending on the type of permit (WPCF or NPDES) issued by the DEQ and the type of disposal/reuse methods implemented.

Advantages

The advantages to Alternative B are:

- High-quality effluent allows for multiple beneficial reuses to be utilized.
- Meets the City's long-term planning goals.
- Potential reuse of existing infrastructure for disposal (percolation ponds).

Disadvantages

The disadvantages to Alternative B are:

- High capital cost.
- High operation and maintenance (O&M) cost.
- Winter storage may be required.
- Permitting indirect or direct discharge to the John Day River may be difficult.

Alternative C - New Wastewater Storage Lagoon System and Mechanical Wastewater Treatment Facility

With this alternative, the existing WWTF would be demolished and a new wastewater treatment system composed of similar components described in Alternatives A and B would be constructed. The use of each facility would be dependent on the reuse demand for Class A or B wastewater produced by the mechanical WWTF. This would allow the City to optimize the beneficial reuse of a Class A or B effluent and provide for storage for the City's wastewater during periods when the City's wastewater production exceeds the beneficial reuse demand.

The water balance developed for Alternative C is shown on Figure 4-6. For planning purposes, the water balance assumes the City can reuse all wastewater produced during the summer months. During the winter months, the City would store wastewater and then reuse the treated wastewater when permitting allows in the spring. According to the water balance, the City would need to construct approximately 33 MG of storage on an approximately 25-acre site to meet the design criteria developed in Chapter 2. The lagoon system would consist of a single storage lagoon approximately 25 acres in area. As the demand for reuse wastewater exceeds that produced by the WWTF, the City would convey stored wastewater back through the pipe network to dedicated reuse sites, alleviating the need for crop management and maximizing water reuse capabilities.

Alternative C would allow the City to maintain its existing WPCF Permit and discontinue the apparent indirect discharge to the John Day River through the percolation ponds. Alternative C would produce a Class A or B effluent for wastewater beneficial reuse meeting the City's long-term planning goals. However, no viable sites to the sites have been identified to construct a storage lagoon. Therefore, Alternative C is not a viable option.

Cost

The estimated project cost for Alternative C is approximately $13,807,000 and is shown on Figure 4-7.

Advantages

The advantages to Alternative C are:

- High-quality effluent allows for multiple beneficial reuses to be utilized.
- Most beneficial reuse options available.
- Meets the City's long-term planning goals.
- Discontinues use of the percolation ponds and alleviates concerns surrounding the apparent hydraulic connection to the John Day River.
- Land application is a proven and accepted method of disposal.
- Maintains the WPCF Permit.
- Future NPDES Permit discharge limits would not apply.

Disadvantages

The disadvantages to Alternative C are:

- Most expensive alternative.
- High capital cost.
- High O&M cost.
- Land acquisition or condemnation is needed.
- No viable landowners have been identified.
- Improvements cannot be phased for installation over time.

Common Components Required for Each Alternative

With each alternative presented above, the new WWTF would be relocated to a new site and some or all of the structures at the existing WWTF would be demolished. Therefore, demolition costs are included in each cost estimate.

Regardless of the treatment alternative implemented, the new WWTF must include preliminary treatment to remove grit and debris. Removal of grit and debris are essential to protect treatment equipment and pumps from excessive wear and plugging. The new headworks would consist of a fine screening system to remove plastics, rags, etc.; a new influent flowmeter; and a grit removal chamber. To provide protection and prevent freezing of the new headworks equipment (screening and grit dewatering equipment), a new headworks building would need to be constructed.

Conceptual Discussion of Effluent Reuse and Disposal Options

In this section, the current and potential future effluent reuse and disposal options available to the City are conceptually discussed. The associated treatment class requirements for each option are also discussed and paired with the appropriate treatment alternative previously presented. See Figure 4-8 for a map of the potential land application and beneficial reuse locations potentially available to the City. See Figure 4-9 for a detailed description of the wastewater treatment classifications, the associated treatment requirements, and the associated beneficial reuse applications for each classification.

Option 1 - Class D Land Application and Beneficial Reuse

Class D treatment capabilities could be achieved through the treatment lagoon system proposed in Alternative A. Beneficial use of Class D wastewater is limited to crops grown for non-human consumption (i.e., cattle feed and fodder) after disinfection. The irrigation area must be signed, fenced, and have a minimum 100-foot setback from areas with public access.

Due to land application practices, irrigation of wastewater during the winter months is not permitted. Therefore, the treatment lagoon would need ample capacity to store the City's wastewater during the winter months.

No additional costs for Class D land application and beneficial reuse above what is already proposed in the Alternative A cost estimate is anticipated.

Option 2 - Class B Land Application and Beneficial Reuse

Class B treatment capabilities could be achieved through the proposed mechanical WWTF (Alternatives B and C). To summarize, the City's current and potential Class B uses consist of the following:

- Irrigation of the golf course
- Water source for landscape and restricted recreational impoundments (reclaimed water lake at the Innovation Gateway)
- Non-residential urinal and toilet flushing
- Hydroponic greenhouse heating and cooling (non-contact)
- Log deck watering at Malheur Lumber

Option 3 - Class A Land Application and Beneficial Reuse

Class A treatment capabilities can be achieved through the proposed mechanical WWTF (Alternatives B and C). The capital cost for upgrading an MBR facility from Class B to Class A is negligible. To summarize, some of the City's current and potential Class A uses consist of the following:

- Any beneficial use indicated in Option 2
- Landscape irrigation for areas open to public (parks, sports complex, greenway, etc.)
- Irrigation for any agricultural or horticultural use (hydroponic greenhouses)
- Water supply source for non-restricted recreational impoundments (fishing, boating, etc.)
- Torrefaction process water at Malheur Lumber

One Class A beneficial reuse option identified as torrefaction process water would use the City's wastewater at Malheur Lumber. Additional treatment of the City's wastewater may be necessary for this beneficial reuse. If additional treatment is requested by the consumer above Class A treatment capabilities, the associated costs would be the consumer's responsibility and not the City's. Therefore, costs associated with additional treatment above Class A for site specific beneficial reuse is not provided in this WWFP Update.

Option 4 - Class A Aquifer Storage and Recovery

Aquifer storage and recovery (ASR) is a means to enhance natural groundwater recharge through injection wells to reclaim the water at a later date. This would allow the City to dispose of wastewater during periods when reuse demands are low and reclaim the water when reuse demands exceed the quantity of wastewater produced by the City. Currently, ASR with wastewater is being implemented or is under consideration around the United States to combat water deficits. However, more study is needed to document the feasibility, permitting, and costs associated with ASR in Oregon. For the City, the ASR well would be utilized primarily as a reclaimed water resource due to the controversy surrounding apparent indirect discharge to the John Day River and the lack of available land in the area for wastewater storage. A preliminary search of well logs in the area revealed the ASR well would need to reach a depth of approximately 600 feet below ground surface to tap a confined aquifer not currently being used as a drinking source.

The City would need to prove that the effluent water characteristics meet the requirements of Oregon Administrative Rule (OAR) 340-044. Currently, OAR 340-044-0015 prohibits injecting municipal wastewater directly into groundwater. For this option to be considered, OAR 340-044-0015 would need to be modified, and the City of John Day would need to conduct water tests on the confined aquifer not currently being used as a drinking water source down gradient of the proposed injection site. The City would need to show that the wastewater injection process does not introduce contaminants into groundwater that violate any primary drinking water regulation under the Safe Water Drinking Water Act, or fails to comply with groundwater protection requirements specified in OAR 340-040.

The estimated cost for installing an ASR well is approximately $340,000 and is shown on Figure 4-10.

Option 5 - Underground Injection Control

The DEQ Underground Injection Control (UIC) Program is responsible for regulating the placement of fluids underground for storage or disposal. The goal of the UIC Program is to protect the highest beneficial use of groundwater, while allowing underground injection of permitted fluids. By protecting the naturally high quality of groundwater, the public's health, safety, and welfare, and the environment are protected during subsurface injection activities. The regulations are specifically designed to protect groundwater through managing and monitoring water quality before it is discharged into the subsurface.

A UIC facility is a potential reuse option for the City. However, a UIC facility must also meet the requirements of OAR 340-044. Therefore, the City must be able to site the UIC facility in a location that is not directly connected to shallow groundwater or be able to prove that injection activities do not degrade groundwater quality at the interface between the shallow groundwater aquifer and the

UIC facility. Currently, OAR 340-044-0015 prohibits direct injection of municipal wastewater into groundwater.

The City's UIC facility would potentially consist of a perforated pipe buried below the ground surface but above the elevation of the shallow groundwater. The soil separation between the bottom of the UIC facility and the shallow groundwater would allow for reuse of the City's Class A effluent without a direct connection to the shallow groundwater. The estimated cost for installing a UIC facility is approximately $100,000 and is shown on Figure 4-11.

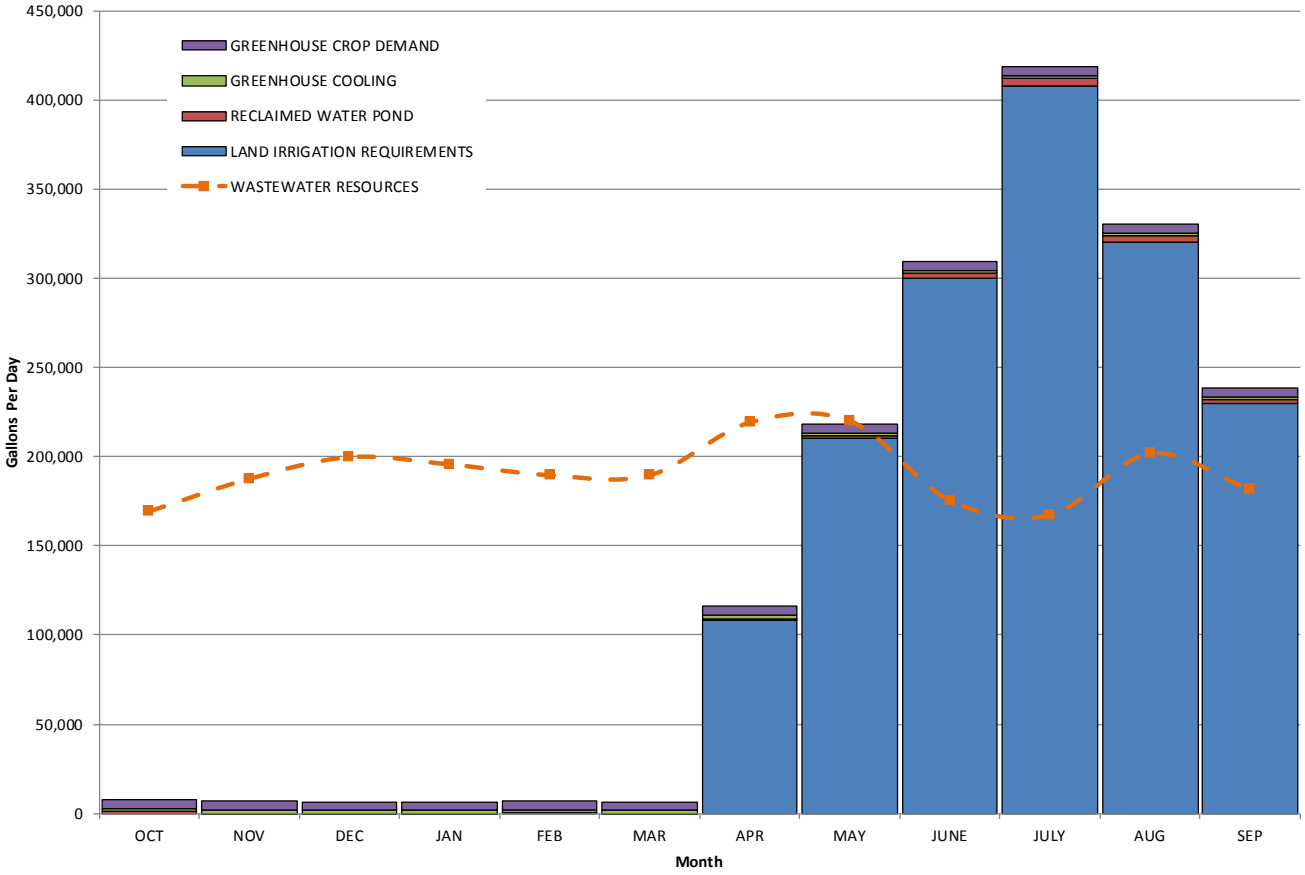
Purple Pipe System and Wastewater Reuse Demands

To convey Class A or Class B wastewater to dedicated reuse sites, a "purple pipe" system is needed. The purple pipe system would consist of a piping network, a 500,000-gallon storage reservoir to offset fluctuations in system supply and demands, and a pump station to pressurize the distribution system. The City's potable water system would be connected to the purple pipe network near the proposed WWTF location to supplement water demands during low flow periods. The pipe network would consist of approximately 13,000 feet of 8-inch main line that would originate at the proposed mechanical WWTF site and would be installed east to the ballfields and west to the golf course and Malheur Lumber as shown on Figure 4-8. The main line would be tapped where needed to convey treated wastewater to other identified disposal sites, such as irrigation of the greenway, reclaimed water pond, greenhouses, etc. The cost to install the 8-inch main line and appurtenances is approximately $2,212,000. A cost estimate breakdown can be seen on Figure 4-12.

The City's potential wastewater resources from the mechanical WWTF and reuse demands were compared to determine the approximate volume of disposal available from the City's current reuse options. Assuming wastewater reuse is the only method for disposal, the City would need to identify enough reuse demand to consume on average 213,000 gpd (the average daily flow between January 2012 and December 2016).

The City is currently pursuing the construction of their first greenhouse. When fully functional, the greenhouse will have an annual total reuse demand of approximately 2.4 MG per year for heating/cooling and crop management. As the City constructs more greenhouses, that demand will increase. The reclaimed water pond at the Innovation Gateway will be approximately 1 acre in area and will evaporate Class A effluent as a means of disposal. The annual storage deficit from evaporation will be approximately 0.54 MG per year. Producing a Class A effluent from the mechanical WWTF would allow the City to irrigate approximately 25 acres between the ballfields, parks, and proposed greenway at the Innovation Gateway. Another 33 acres of irrigable land is available at the golf course. However, irrigation practices in the John Day area only allow reuse via irrigation between April and October of each year. As seen on Chart 4-1 below, a large abundance of wastewater remains for reuse/disposal in the winter months. This is another indication why it is important for the City to have another means of reuse/disposal in the winter months whether it is direct discharge to the John Day River, an ASR well, or a UIC facility.

CHART 4-1
WASTEWATER RESOURCE VERSUS DEMAND



Summary

The WWTF alternatives and effluent disposal/reuse options discussed in this chapter were presented to the City for discussion and selection. Advantages, disadvantages, and estimated costs of each option were discussed. The improvements selected by the City are discussed in Chapter 5.

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE A - NEW WASTEWATER TREATMENT LAGOON SYSTEM WATER BALANCE
February 2019

	Lagoons										Irrigation Area				
Month	**Effluent[1]**		**Precipitation[2]**		**Evaporation[3]**		**Seepage**	**Available Crop Irrigation [4]**	**Storage Volume (+/-)**	**Cumulative Storage Volume[5]**	**Crop Water Use[6]**	**Net Irrigation Requirements[6]**	**Gross Irrigation Requirements**	**Volume From Lagoons**	
	Average Flow (MGD)	Volume (MG)	Average Monthly (in)	Volume (MG)	Average Monthly (in)	Volume (MG)	Volume (MG)	Volume (MG)	(MG)	(MG)	(in)	(in)	(in)	(MG)	(acre-in)
October	0.191	5.91	1.01	0.96	1.00	0.95	0.00	0.00	5.92	5.92	0	0	0	0	0
November	0.197	5.50	1.35	1.28	1.00	0.95	0.00	0.00	5.84	11.76	0	0	0	0	0
December	0.218	6.77	1.3	1.24	1.00	0.95	0.00	0.00	7.05	18.81	0	0	0	0	0
January	0.217	6.50	1.18	1.12	1.00	0.95	0.00	0.00	6.67	25.48	0	0	0	0	0
February	0.215	6.66	0.77	0.73	1.00	0.95	0.00	0.00	6.44	31.92	0	0	0	0	0
March	0.213	6.39	1.13	1.07	1.00	0.95	0.00	0.00	6.52	38.43	0	0	0	0	0
April	0.244	7.55	1.33	1.26	4.25	4.04	0.00	3.36	1.41	39.85	2.17	1.65	2.06	3.36	123.75
May	0.243	7.54	1.79	1.70	6.14	5.84	0.00	6.74	-3.34	36.51	4.49	3.31	4.14	6.74	248.25
June	0.210	6.31	1.39	1.32	6.69	6.36	0.00	9.31	-8.04	28.47	5.35	4.57	5.71	9.31	342.75
July	0.210	6.51	0.52	0.49	8.66	8.23	0.00	13.07	-14.30	14.17	6.69	6.42	8.03	13.07	481.50
August	0.199	5.97	0.78	0.74	7.91	7.52	0.00	10.26	-11.07	3.10	5.31	5.04	6.30	10.26	378.00
September	0.196	6.08	0.71	0.67	5.42	5.15	0.00	7.13	-5.53	-2.43	3.86	3.50	4.38	7.13	262.50
Totals		**77.68**	**13.26**	**12.60**	**45.07**	**42.83**	**0**	**49.87**	**-2.43**		**27.87**	**24.49**	**30.61**	**49.87**	**1,836.75**

	Proposed	
Total Storage Volume =	45.6	MG
Assumed Acreage to be Irrigated =	60	Acres
Assumed Lagoon Surface Area for Precipitation and Evaporation Calculations =	35	Acres

Notes:

[1] Effluent flow data have been estimated by averaging monthly effluent flow data from January 2012 to December 2016, converting to a per capita flow, and then multiplying by the projected poplulation in 2020.

[2] Average annual precipitation for John Day, Oregon, from 1950 to 2010 as published by the WRCC.

[3] Average monthly evaporation rates are 70 percent of pan values recorded for the Bend 7 NE Experimental Station (1991 to 2005), as reported by the WRCC.

[4] Available crop irrigation is based on gross irrigation requirement for alfalfa hay.

[5] Equals Influent + Precipitation - Evaporation - Seepage - Irrigation. Existing usable lagoon storage capacity (above 3-foot minimum depth).

[6] Taken from Oregon State University Extension Service "Oregon Crop Water Use and Irrigation Requirements," October 1992, Region = Dayville-Canyon City, crop = alfalfa hay, probability = 7 out of 10 years.

acre-in = acre per inch
in = inches
MG = million gallons
MGD = million gallons per day
WRCC = Western Regional Climate Center

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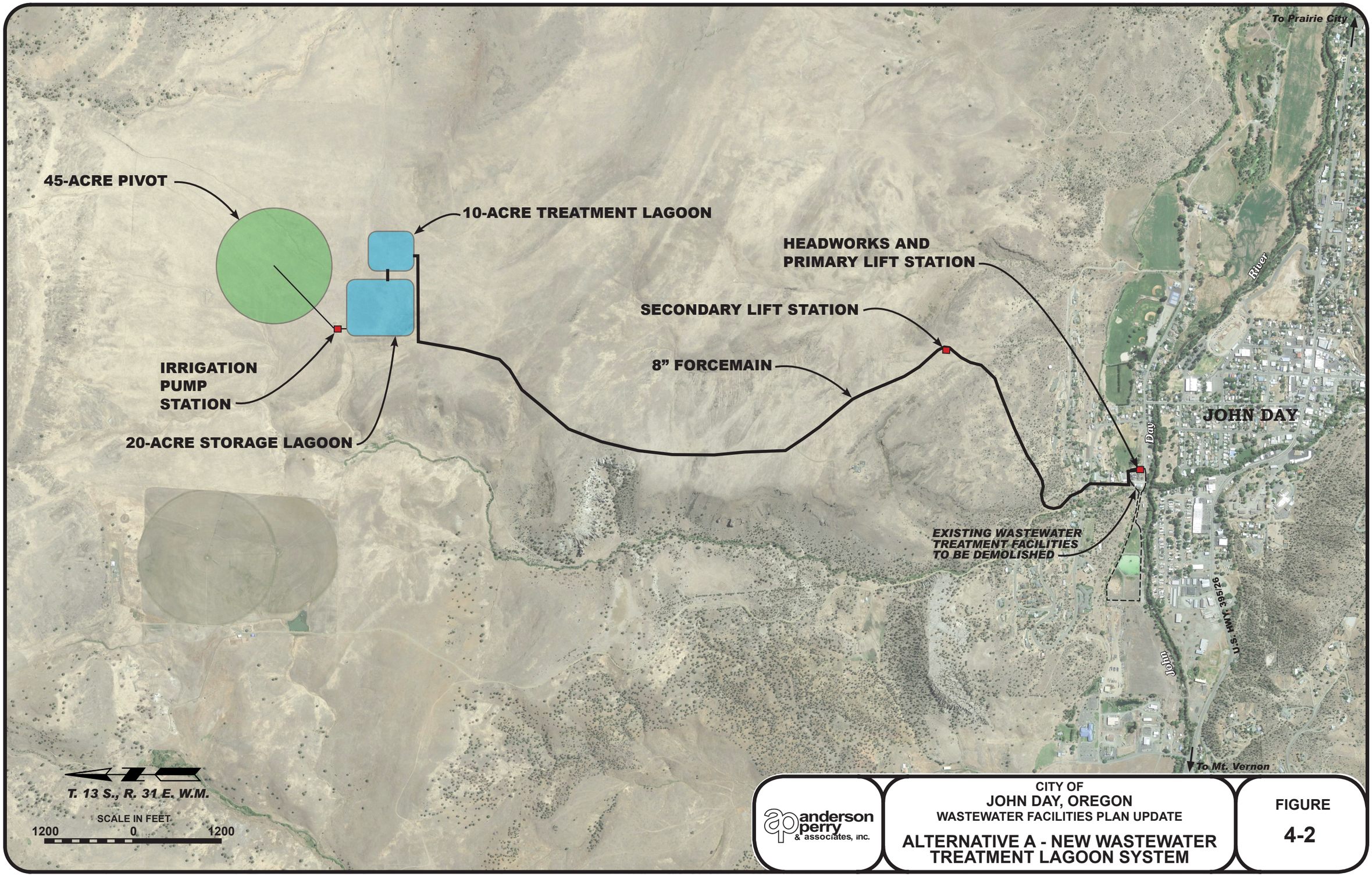
CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE A - NEW WASTEWATER TREATMENT LAGOON SYSTEM WATER BALANCE

FIGURE
4-1



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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE

ALTERNATIVE A - NEW WASTEWATER TREATMENT LAGOON SYSTEM

FIGURE
4-2

Job# 592-25-020 Aug. 21, 2018 lbauer

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE A - NEW WASTEWATER TREATMENT LAGOON SYSTEM
PRELIMINARY COST ESTIMATE
(YEAR 2018 COSTS)

NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
1	Mobilization	LS	All Req'd	$ 201,000	$ 201,000
2	Quality Control/Project Safety	LS	All Req'd	20,000	20,000
3	Site Work	LS	All Req'd	50,000	50,000
4	Headworks	LS	All Req'd	650,000	650,000
5	Primary Lift Station	LS	All Req'd	300,000	300,000
6	Secondary Lift Station	LS	All Req'd	250,000	250,000
7	8-inch Forcemain	LF	13,200	40	528,000
8	Treatment and Storage Lagoon	LS	All Req'd	1,056,000	1,056,000
9	Irrigation Pivot and Pump Station	LS	All Req'd	250,000	250,000
10	Electrical, Controls, and Instrumentation	LS	All Req'd	350,000	350,000
11	Emergency Generator Set	LS	All Req'd	200,000	200,000
12	Chlorine Disinfection System	LS	All Req'd	215,000	215,000
13	Existing Facility Demolition	LS	All Req'd	120,000	120,000
14	Seeding and Surface Restoration	LS	All Req'd	50,000	50,000
				Subtotal Estimated Construction Costs (2018 Dollars)	**$ 4,240,000**
				Administration, Legal, Engineering, and Contingencies @ 30%	1,270,000
				Total Estimated Construction Cost	**$ 5,510,000**
	OTHER ESTIMATED PROJECT COSTS				
				Funding Acquisition	30,000
				Environmental Review Report	35,000
				Archaeological Report	20,000
				Cultural Resource Monitoring	35,000
				Regulatory Agency Permitting, Reporting, and Review Fees	15,000
				Land Acquisition (Approximately 80 Acres) and Easements	160,000
				Total Other Estimated Project Costs	**$ 295,000**
				TOTAL ESTIMATED ALTERNATIVE A PROJECT COST	**$ 5,805,000**

PRESENT WORTH ANALYSIS (2018 DOLLARS)

Item	Description	Annual Cost
ADDITIONAL ANNUAL OPERATION, MAINTENANCE, AND REPLACEMENT (OM&R)		
1	Labor (Including Benefits)	$ 30,000
2	Utilities	15,000
3	Supplies, Parts, Maintenance, and Repairs	35,000
4	Sampling, Testing, and Permit Fees	7,500
5	Operator Training and Certification	2,500
6	Replacement	25,000
	Total OM&R	**$ 115,000**
	Present Worth OM&R Cost (5%, 20 years)	1,434,000
	Total Present Worth (2018 Dollars)	**$ 6,944,000**

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CITY OF
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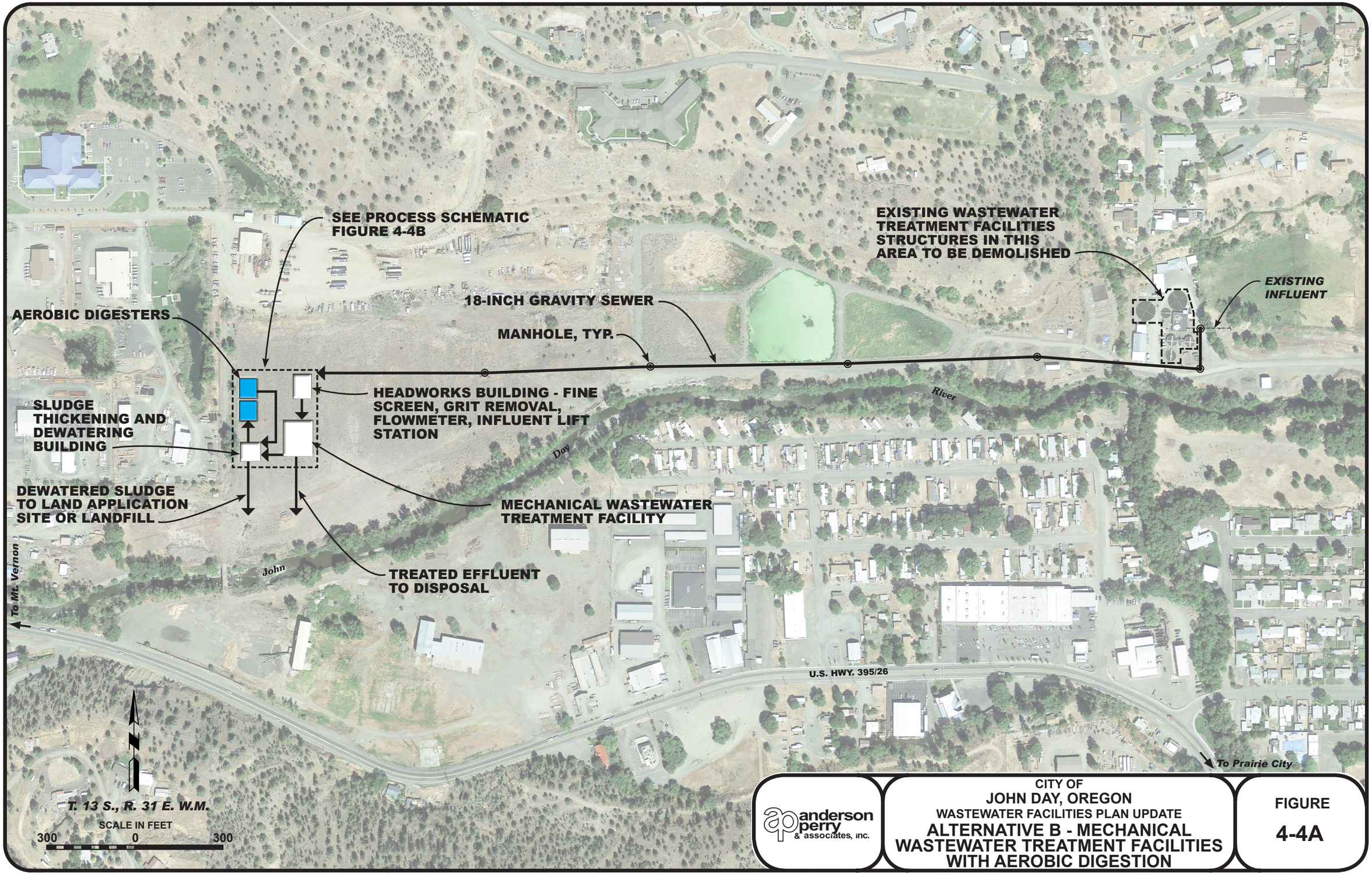
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE A - NEW WASTEWATER TREATMENT LAGOON SYSTEM
PRELIMINARY COST ESTIMATE

FIGURE 4-3



CITY OF
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WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE B - MECHANICAL WASTEWATER TREATMENT FACILITIES WITH AEROBIC DIGESTION

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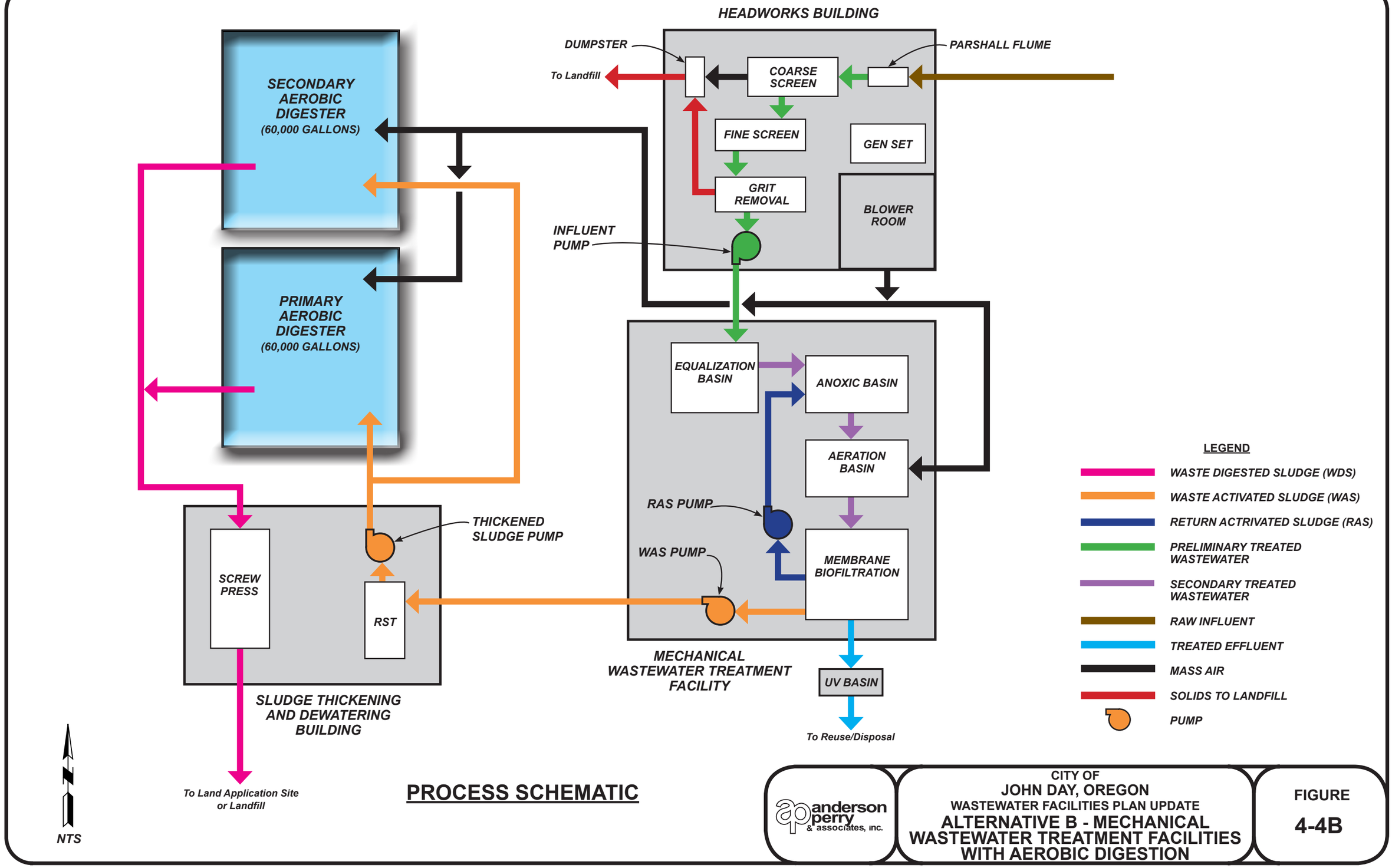
FIGURE
4-4A

Job# 592-25-020 Jul. 19, 2018 lbauer



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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE B - MECHANICAL WASTEWATER TREATMENT FACILITIES WITH AEROBIC DIGESTION

FIGURE
4-4B

Job# 592-25-020 Jul. 19, 2018 lbauer

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE B - NEW MECHANICAL WASTEWATER TREATMENT FACILITY WITH AEROBIC DIGESTION
PRELIMINARY COST ESTIMATE
(YEAR 2018 COSTS)

NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
1	Mobilization	LS	All Req'd	$ 379,000	$ 379,000
2	Quality Control/Project Safety	LS	All Req'd	20,000	20,000
3	Site Work	LS	All Req'd	80,000	80,000
4	18-inch Gravity Sewer	LF	3,000	65	195,000
5	Manhole	EA	7	4,000	28,000
6	Flowmeter	LS	All Req'd	50,000	50,000
7	Influent Coarse Screen	LS	All Req'd	150,000	150,000
8	Influent Fine Screen	LS	All Req'd	180,000	180,000
9	Grit Removal	LS	All Req'd	170,000	170,000
10	Influent Pumps	LS	All Req'd	55,000	55,000
11	Headworks Building	LS	All Req'd	250,000	250,000
12	Membrane Biological Reactor Package Treatment Plant	LS	All Req'd	3,000,000	3,000,000
13	Thickening and Dewatering Building	LS	All Req'd	170,000	170,000
14	Sludge Thickening Equipment	LS	All Req'd	400,000	400,000
15	Aerobic Digesters	LS	All Req'd	750,000	750,000
16	Sludge Dewatering Equipment	LS	All Req'd	400,000	400,000
17	Ultraviolet Disinfection	LS	All Req'd	175,000	175,000
18	Process and Yard Piping	LS	All Req'd	180,000	180,000
19	Operations Building	LS	All Req'd	185,000	185,000
20	Electrical, Controls, and Instrumentation	LS	All Req'd	950,000	950,000
21	Fencing	LS	All Req'd	25,000	25,000
22	Access Road	LS	All Req'd	30,000	30,000
23	Existing Facility Demolition	LS	All Req'd	120,000	120,000
				Subtotal Estimated Construction Cost	**$ 7,942,000**
				Administration, Legal, Engineering, and Contingencies @ 30%	2,380,000
				Total Estimated Construction Cost	**$ 10,322,000**
	OTHER ESTIMATED PROJECT COSTS				
				Funding Acquisition	30,000
				Environmental Review Report	35,000
				Archaeological Report	20,000
				Cultural Resource Monitoring	15,000
				Regulatory Agency Permitting, Reporting, and Review Fees	15,000
				Biosolids Handling Truck	100,000
				Total Other Estimated Project Costs	**$ 215,000**
				TOTAL ESTIMATED ALTERNATIVE B PROJECT COST	**$ 10,537,000**

PRESENT WORTH ANALYSIS (2018 DOLLARS)

Item	Description	Annual Cost
	ADDITIONAL ANNUAL OPERATION, MAINTENANCE, AND REPLACEMENT (OM&R)	
1	Labor	$ 75,000
2	Utilities	65,000
3	Supplies, Parts, Maintenance, and Repairs	50,000
4	Sampling, Testing, and Permit Fees	15,000
5	Operator Training and Certification	3,000
6	Replacement	50,000
7	Chemicals	30,000
	Total OM&R	**$ 288,000**
	Present Worth OM&R Cost (5%, 20 years)	3,590,000
	Total Present Worth (2018 Dollars)	**$ 14,127,000**

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE B - NEW MECHANICAL WASTEWATER TREATMENT FACILITY WITH AEROBIC DIGESTION
PRELIMINARY COST ESTIMATE

FIGURE
4-5A

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE B - NEW MECHANICAL WASTEWATER TREATMENT FACILITY WITH COMPOST FACILITY
PRELIMINARY COST ESTIMATE
(YEAR 2018 COSTS)

NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
1	Mobilization	LS	All Req'd	$ 330,500	$ 330,500
2	Quality Control/Project Safety	LS	All Req'd	20,000	20,000
3	Site Work	LS	All Req'd	80,000	80,000
4	18-inch Gravity Sewer	LF	3,000	65	195,000
5	Manhole	EA	7	3,500	24,500
6	Flowmeter	LS	All Req'd	50,000	50,000
7	Influent Coarse Screen	LS	All Req'd	150,000	150,000
8	Influent Fine Screen	LS	All Req'd	180,000	180,000
9	Grit Removal	LS	All Req'd	170,000	170,000
10	Influent Pumps	LS	All Req'd	55,000	55,000
11	Headworks Building	LS	All Req'd	250,000	250,000
12	Membrane Biological Reactor Package Treatment Plant	LS	All Req'd	3,000,000	3,000,000
13	Thickening and Dewatering Building	LS	All Req'd	170,000	170,000
14	Sludge Dewatering Equipment	LS	All Req'd	400,000	400,000
15	Odor Control	LS	All Req'd	150,000	150,000
16	Compost Facility	LS	All Req'd	100,000	80,000
17	Ultraviolet Disinfection	LS	All Req'd	175,000	175,000
18	Process and Yard Piping	LS	All Req'd	180,000	180,000
19	Operations Building	LS	All Req'd	185,000	185,000
20	Electrical, Controls, and Instrumentation	LS	All Req'd	900,000	900,000
21	Fencing	LS	All Req'd	25,000	25,000
22	Access Road	LS	All Req'd	30,000	30,000
23	Existing Facility Demolition	LS	All Req'd	120,000	120,000
				Subtotal Estimated Construction Cost	**$ 6,920,000**
				Administration, Legal, Engineering, and Contingencies @ 30%	2,080,000
				Total Estimated Construction Cost	**$ 9,000,000**
	OTHER ESTIMATED PROJECT COSTS				
				Funding Acquisition	30,000
				Environmental Review Report	35,000
				Archaeological Report	20,000
				Cultural Resource Monitoring	15,000
				Regulatory Agency Permitting, Reporting, and Review Fees	20,000
				Compost Facility Equipment	210,000
				Total Other Estimated Project Costs	**$ 330,000**
				TOTAL ESTIMATED ALTERNATIVE B PROJECT COST	**$ 9,330,000**

PRESENT WORTH ANALYSIS (2018 DOLLARS)

Item	Description	Annual Cost
ADDITIONAL ANNUAL OPERATION, MAINTENANCE, AND REPLACEMENT (OM&R)		
1	Labor	$ 90,000
2	Utilities	65,000
3	Supplies, Parts, Maintenance, and Repairs	60,000
4	Sampling, Testing, and Permit Fees	20,000
5	Operator Training and Certification	3,000
6	Replacement	50,000
7	Chemicals	30,000
	Total OM&R	**$ 318,000**
	Present Worth OM&R Cost (5%, 20 years)	3,963,000
	Total Present Worth (2018 Dollars)	**$ 13,293,000**

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE B - NEW MECHANICAL WASTEWATER TREATMENT FACILITY WITH COMPOST FACILITY
PRELIMINARY COST ESTIMATE

FIGURE 4-5B

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE C - NEW WASTEWATER STORAGE LAGOON SYSTEM AND NEW MECHANICAL WASTEWATER TREATMENT FACILITY
WATER BALANCE
February 2019

	Lagoons										Irrigation Area				
Month	**Effluent[1]**		**Precipitation[2]**		**Evaporation[3]**		**Seepage**	**Available Crop Irrigation [4]**	**Storage Volume (+/-)**	**Cumulative Storage Volume[5]**	**Crop Water Use[6]**	**Net Irrigation Requirements[6]**	**Gross Irrigation Requirements**	**Volume From Lagoons**	
	Average Flow (MGD)	Volume (MG)	Average Monthly (in)	Volume (MG)	Average Monthly (in)	Volume (MG)	Volume (MG)	Volume (MG)	(MG)	(MG)	(in)	(in)	(in)	(MG)	(acre-in)
October	0.191	5.91	1.01	0.82	1.00	0.81	0.00	0.00	5.92	5.92	0	0	0	0	0
November	0.197	5.50	1.35	1.10	1.00	0.81	0.00	0.00	5.79	11.71	0	0	0	0	0
December	0.218	6.77	1.3	1.06	1.00	0.81	0.00	0.00	7.01	18.72	0	0	0	0	0
January	0.217	6.50	1.18	0.96	1.00	0.81	0.00	0.00	6.64	25.36	0	0	0	0	0
February	0.215	6.66	0.77	0.63	1.00	0.81	0.00	0.00	6.47	31.83	0	0	0	0	0
March	0.213	6.39	1.13	0.92	1.00	0.81	0.00	0.00	6.50	38.33	0	0	0	0	0
April	0.000	0.00	1.33	1.08	4.25	3.46	0.00	0.84	-3.22	35.12	2.17	1.65	2.06	0.84	30.94
May	0.000	0.00	1.79	1.46	6.14	5.00	0.00	1.69	-5.23	29.89	4.49	3.31	4.14	1.69	62.06
June	0.000	0.00	1.39	1.13	6.69	5.45	0.00	2.33	-6.64	23.24	5.35	4.57	5.71	2.33	85.69
July	0.000	0.00	0.52	0.42	8.66	7.05	0.00	3.27	-9.90	13.34	6.69	6.42	8.03	3.27	120.38
August	0.000	0.00	0.78	0.64	7.91	6.44	0.00	2.57	-8.37	4.97	5.31	5.04	6.30	2.57	94.50
September	0.000	0.00	0.71	0.58	5.42	4.41	0.00	1.78	-5.62	-0.65	3.86	3.50	4.38	1.78	65.63
Totals		**37.73**	**13.26**	**10.80**	**45.07**	**36.71**	**0**	**12.47**	**-0.65**		**27.87**	**24.49**	**30.61**	**12.47**	**459.19**

	Proposed	
Total Storage Volume =	39.1	MG
Assumed Acreage to be Irrigated =	15	Acres
Assumed Lagoon Surface Area for Precipitation and Evaporation Calculations =	30	Acres

Notes:
[1] Effluent flow data were estimated by averaging monthly efluent flow data from January 2012 to December 2016, converting to a per capita flow, and then multiplying by the projected poplulation in 2020.
[2] Average annual precipitation for John Day, Oregon, from 1950 to 2010 as published by the WRCC.
[3] Average monthly evaporation rates are 70 percent of pan values recorded for the Bend 7 NE Experimental Station (1991 to 2005), as reported by the WRCC.
[4] Available crop irrigation is based on gross irrigation requirement for alfalfa hay.
[5] Equals Influent + Precipitation - Evaporation - Seepage - Irrigation. Existing usable lagoon storage capacity (above 3-foot minimum depth).
[6] Taken from Oregon State University Extension Service "Oregon Crop Water Use and Irrigation Requirements," October 1992, Region = Dayville-Canyon City, crop = alfalfa hay, probability = 7 out of 10 years.

acre-in = acre per inch
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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE C - NEW WASTEWATER STORAGE LAGOON SYSTEM AND NEW MECHANICAL WASTEWATER TREATMENT FACILITY
WATER BALANCE

FIGURE
4-6

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNATIVE C - NEW WASTEWATER STORAGE LAGOON SYSTEM AND NEW MECHANICAL WASTEWATER TREATMENT FACILITY
PRELIMINARY COST ESTIMATE
(YEAR 2018 COSTS)

NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
1	Mobilization	LS	All Req'd	$ 495,500	$ 495,500
2	Quality Control/Project Safety	LS	All Req'd	20,000	20,000
3	Site Work	LS	All Req'd	100,000	100,000
4	Primary Lift Station	LS	All Req'd	300,000	300,000
5	Secondary Lift Station	LS	All Req'd	250,000	250,000
6	8-inch Forcemain	LF	13,200	40	528,000
7	Storage Lagoon	LS	All Req'd	1,056,000	1,056,000
8	Existing Facility Demolition	LS	All Req'd	120,000	120,000
9	18-inch Gravity Sewer	LF	3,000	65	195,000
10	Manhole	EA	7	3,500	24,500
11	Flowmeter	LS	All Req'd	50,000	50,000
12	Influent Coarse Screen	LS	All Req'd	150,000	150,000
13	Influent Fine Screen	LS	All Req'd	180,000	180,000
14	Grit Removal	LS	All Req'd	170,000	170,000
15	Influent Pumps	LS	All Req'd	55,000	55,000
16	Headworks Building	LS	All Req'd	250,000	250,000
17	Membrane Biological Reactor Package Treatment Plant	LS	All Req'd	3,000,000	3,000,000
18	Thickening and Dewatering Building	LS	All Req'd	170,000	170,000
19	Sludge Thickening Equipment	LS	All Req'd	400,000	400,000
20	Aerobic Digesters	LS	All Req'd	750,000	750,000
21	Sludge Dewatering Equipment	LS	All Req'd	400,000	400,000
22	UV Disinfection	LS	All Req'd	175,000	175,000
23	Process and Yard Piping	LS	All Req'd	180,000	180,000
24	Operations Building	LS	All Req'd	185,000	185,000
26	Electrical, Controls, and Instrumentation	LS	All Req'd	990,000	990,000
27	Fencing	LS	All Req'd	40,000	40,000
28	Access Road	LS	All Req'd	40,000	40,000
29	Existing Facility Demolition	LS	All Req'd	120,000	120,000
				Subtotal Estimated Construction Cost	**$ 10,394,000**
				Administration, Legal, Engineering, and Contingencies @ 30%	3,118,000
				Total Estimated Construction Cost	**$ 13,512,000**
	OTHER ESTIMATED PROJECT COSTS				
				Funding Acquisition	30,000
				Environmental Review Report	35,000
				Archaeological Report	20,000
				Cultural Resource Monitoring	15,000
				Regulatory Agency Permitting, Reporting, and Review Fees	15,000
				Land Acquisition (Approximately 40 Acres) and Easements	80,000
				Biosolids Handling Truck	100,000
				TOTAL ESTIMATED ALTERNATIVE C PROJECT COST	**$ 13,807,000**

PRESENT WORTH ANALYSIS (2018 DOLLARS)

Item	Description	Annual Cost
ADDITIONAL ANNUAL OPERATION, MAINTENANCE, AND REPLACEMENT (OM&R)		
1	Labor	$ 80,000
2	Utilities	70,000
3	Supplies, Parts, Maintenance, and Repairs	50,000
4	Sampling, Testing, and Permit Fees	7,500
5	Operator Training and Certification	3,000
6	Replacement	50,000
7	Chemicals	40,000
	Total OM&R	**$ 300,500**
	Present Worth OM&R Cost (5%, 20 years)	3,745,000
	Total Present Worth (2018 Dollars)	**$ 17,552,000**

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
ALTERNTIVE C - NEW WASTEWATER STORAGE LAGOON SYSTEM AND NEW MECHANICAL WASTEWATER TREATMENT FACILITY
PRELIMINARY COST ESTIMATE

FIGURE 4-7

CLASS D LAND APPLICATION
(SEE FIGURE 4-3 FOR LOCATION)

CLASS A OR CLASS B BENEFICIAL REUSE AT MALHEUR LUMBER
LOG DECK WATERING OR TORREFACTION

CLASS A UNDERGROUND INJECTION CONTROL FACILITY

MECHANICAL WASTEWATER TREATMENT FACILITY

CITY'S EXISTING EFFLUENT DISPOSAL SITE
(PERCOLATION PONDS)

EXISTING WASTEWATER TREATMENT FACILITIES

CLASS A LAND APPLICATION AT THE 7TH STREET BASEBALL/SOFTBALL COMPLEX

CLASS A AQUIFER STORAGE AND RECOVERY WELL

POTENTIAL PURPLE PIPE (RECLAIMED WATER) NETWORK

CLASS A LAND APPLICATION AT THE PROPOSED GREENWAY

CLASS A OR CLASS B RECLAIMED WATER POND AT THE PROPOSED INNOVATION GATEWAY

CLASS B BENEFICIAL REUSE AT POTENTIAL HOTEL DEVELOPMENT

CLASS A BENEFICIAL REUSE AT THE GREENHOUSES

CLASS B LAND APPLICATION AT THE GOLF COURSE

John Day River

U.S. HWY. 395/26

JOHN DAY

U.S. HWY. 26

U.S. HWY. 395

To Mt. Vernon

To Prairie City

To Canyon City/Burns

T. 13 S., R. 31 E. W.M.

SCALE IN FEET
1000 0 1000

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE

POTENTIAL BENEFICIAL REUSE AND LAND APPLICATION SITES

FIGURE
4-8

Job# 592-25-020 Feb. 27, 2019 lbauer

RECYCLED WATER QUALITY STANDARDS AND REQUIREMENTS

Recycled Water Classification	Beneficial Use Description	Monitoring Requirements	Treatment Requirements
Non-disinfected	Irrigation for growing fodder, fiber, seed crops not intended for human ingestion, or commercial timber.	Per the facility owner's Water Polllution Control Facilities or National Pollutant Discharge Elimination System Permit.	Must be oxidized wastewater.
Class D	Any beneficial use defined above or for the irrigation of firewood, ornamental nursery stock, Christmas trees, sod, or pasture for animals.	Monitoring for *E. coli* once per week at a minimum. Recycled water must not exceed a 30-day log mean of 126 *E. coli* organisms per 100 milliliters (mL) and 406 *E. coli* oranisms per 100 mL in any single sample.	Must be an oxidized and disinfected wastewater that meets the monitoring requirements.
Class C	Any beneficial use defined above or for the irrigation of orchards or vineyards (applied directly to the soil), golf courses, cemeteries, highway medians, or industrial or business campuses; industrial cooling, rock crushing, aggregate washing, mixing concrete, dust control, nonstructural fire fighting using aircraft, street sweeping, or sanitary sewer flushing; water supply source for landscape	Monitoring for total coliform organisms once per week at a minimum. Recycled water must not exceed a median of 23 coliform organisms per 100 mL, based on results of the last seven days that analyses have been completed, and 240 total coliform organisms per 100 mL in any two consecutive samples.	Must be oxidized and disinfected wastewater that meets the monitoring requirements.
Class B	Any beneficial use defined above or for stand-alone fire suppression systems in commercial and residential buildings, non-residential toilet or urinal flushing, or floor drain trap priming; water supply source for restricted recreational impoundments,	Monitoring for total coliform organisms three times per week at a minimum. Recycled water must not exceed 2.2 total coliform organisms per 100 mL, based on results of the last seven days that analyses have been completed, and 23 total coliform organisms per 100 mL in any single sample.	Must be oxidized and disinfected wastewater that meets the monitoring requirements.
Class A	Any beneficial use defined above or for irrigation for any agricultural or horticultural use; landscape irrigation of parks, playgrounds, school yards, residential landscapes, or other landscapes accessible to the public; commercial car washing or fountains when the water is not intended for human consumption; water supply source for nonrestricted recreational impoundments; artificial groundwater recharge by surface infiltration methods or by subsurface injection in accordance with Oregon Administrative Rule (OAR) Chapter 340, Division 44. Direct injection into an underground source of drinking water is prohibited unless allowed by OAR Chapter 340, Division 44.	Monitoring for total coliform organisms must occur once per day at a minimum. Monitoring for turbidity must occur on an hourly basis at a minimum. Before disinfection, unless otherwise approved in writing by the department, the wastewater must be treated with a filtration process, and the turbidity must not exceed an average of 2 nephelometric turbidity units (NTU) within a 24-hour period, 5 NTU more than five percent of the time within a 24-hour period, and 10 NTU at any time. After disinfection, Class A recycled water must not exceed a median of 2.2 total coliform organisms per 100 mL based on results of the last seven days that analyses have been completed, and 23 total coliform organisms per 100 mL in any single sample.	Must be oxidized, filtered, and disinfected wastewater that meets the monitoring requirements.

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE

RECYCLED WATER QUALITY STANDARDS AND REQUIREMENTS

FIGURE 4-9

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
AQUIFER STORAGE AND RECOVERY WELL
PRELIMINARY COST ESTIMATE
(YEAR 2018 COSTS)

NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
1	Mobilization	LS	All Req'd	$ 9,500	$ 9,500
2	Quality Control/Project Safety	LS	All Req'd	10,000	10,000
3	Drill, Furnish, and Install 12-inch Surface Casing	LF	20	300	6,000
4	Grout Seal for 12-inch Surface Casing	LF	20	85	1,700
5	Drill for 8-inch Casing	LF	600	135	81,000
6	Furnish and Install 8-inch Casing	LF	600	60	36,000
7	Perforations on 8-inch Casing	LF	100	50	5,000
8	Furnish and Install 8-inch Well Screen	LF	30	260	7,800
9	Television Inspection	LF	1,200	2.5	3,000
10	Well Pump	LS	All Req'd	60,000	60,000
				Subtotal Estimated Construction Cost	**$ 220,000**
				Administration, Legal, Engineering, and Contingencies @ 30%	70,000
				Total Estimated Construction Cost	**$ 290,000**
				Environmental Report and Permitting	50,000
				TOTAL ESTIMATED DEEP WELL INJECTION PROJECT COST	**$ 340,000**

* More study is needed to determine the feasibility, permitting, and costs associated with aquifer storage and recovery in Oregon.

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CITY OF
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WASTEWATER FACILITIES PLAN UPDATE

AQUIFER STORAGE AND RECOVERY WELL
PRELIMINARY COST ESTIMATE

FIGURE
4-10

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
UNDERGROUND INJECTION CONTROL FACILITY
PRELIMINARY COST ESTIMATE
(YEAR 2018 COSTS)

NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
1	Mobilization	LS	All Req'd	$ 2,400	$ 2,400
2	Quality Control/Project Safety	LS	All Req'd	5,000	5,000
3	24-inch Polyvinyl Chloride Perforated Pipe	LF	400	80	32,000
4	24-inch Butterfly Valve	EA	2	8,000	16,000
5	Bedding and Select Backfill	CY	240	40	9,600
				Subtotal Estimated Construction Cost	**$ 65,000**
				Administration, Legal, Engineering, and Contingencies @ 30%	20,000
				Total Estimated Construction Cost	**$ 85,000**
				Environmental Report and Permitting	15,000
				TOTAL ESTIMATED DEEP WELL INJECTION PROJECT COST	**$ 100,000**

* More study is needed to determine the feasibility and permitting associated with underground injection control facilities with municipal wastewater in Oregon.

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE

UNDERGROUND INJECTION CONTROL FACILITY PRELIMINARY COST ESTIMATE

FIGURE
4-11

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
PURPLE PIPE NETWORK
PRELIMINARY COST ESTIMATE
(YEAR 2018 COSTS)

NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
1	Mobilization	LS	All Req'd	$ 79,000	$ 79,000
2	Quality Control/Project Safety	LS	All Req'd	12,000	12,000
3	8-inch Polyvinyl Chloride Forcemain	LF	13,000	50	650,000
4	8-inch Gate Valves	EA	10	2,500	25,000
5	Bedding and Select Backfill	CY	200	30	6,000
6	Pump Station	LS	All Req'd	120,000	140,000
7	Electrical, Controls, and Instrumentation	LS	All Req'd	100,000	100,000
8	500,000-gallon Reservoir	LS	All Req'd	650,000	650,000
				Subtotal Estimated Construction Cost	**$ 1,662,000**
				Administration, Legal, Engineering, and Contingencies @ 30%	500,000
				Total Estimated Construction Cost	**$ 2,162,000**
				Permitting	50,000
				TOTAL ESTIMATED PURPLE PIPE NETWORK PROJECT COST	**$ 2,212,000**

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE

PURPLE PIPE NETWORK
PRELIMINARY COST ESTIMATE

FIGURE
4-12

Chapter 5 - Selected Improvements

General

This chapter presents the selected improvements to meet the City of John Day's wastewater treatment and effluent disposal/reuse needs for the 20-year planning period. These improvements were selected by the City after careful consideration of the various impacts, objectives, and criteria discussed in Chapter 4 and review, evaluation, and consideration of associated cost estimates.

Selected Improvements

The selected alternative for treatment of wastewater, Alternative B, involves the design and construction of a new membrane bioreactor (MBR) mechanical treatment facility with aerobic digestion, coupled with the purple pipe effluent reuse system and continued discharge into the existing percolation ponds during winter months until a new permit is identified by the Oregon Department of Environmental Quality (DEQ). The selected wastewater treatment facility (WWTF) improvements are shown on Figure 5-1. One of the City's goals for the new WWTF and the Innovation Gateway is to educate the public on the importance of wastewater treatment. Generally, the public perception of WWTFs is negative due to the odor and visual impacts associated with wastewater treatment. To counter the negative perception, the new WWTF will include a visitor's center that houses a tertiary treatment process consisting of hydroponic reactors. The hydroponic reactors are aerated wastewater tanks with suspended plant racks that receive secondary treated wastewater from the MBR. The visitor's center will provide an environment where the public can view wastewater treatment processes and learn the about the benefits of reclaimed water.

Wastewater Treatment, Biosolids Treatment, and Effluent Disposal/Reuse

As discussed in Chapter 3, the City's existing WWTF has many components that have surpassed their service life and need replaced. Therefore, the City has selected Alternative B, which includes construction of an entirely new WWTF at a new location. The existing WWTF is anticipated to be demolished, and the area will be incorporated for use into the Innovation Gateway. The existing percolation ponds will be the only component of the existing WWTF that remains. However, use of the percolation ponds as a method of disposal is expected to be temporary until the DEQ identifies a viable permit pathway. The City will pursue the purple pipe system as its primary method of effluent disposal, as the demand for reuse water exists. As effluent flows exceed reuse demands during the winter months, the City will dispose of effluent in the percolation ponds until another method of reuse/disposal is permitted. The City has selected aerobic digestion for biosolids treatment due to the odor concerns related to composting volatile solids. The compost facility is still a viable option; however, there are concerns regarding where to locate the compost facility to minimize the odor nuisance to the public.

Summary of Estimated Costs

A detailed cost estimate is shown on Figure 5-2. Each major improvement cost is summarized below.

Mechanical Wastewater Treatment with Aerobic Digestion (Alternative B) Construction	$ 7,942,000
Purple Pipe Network Construction	$ 1,662,000
Administration, Legal, Engineering, and Contingencies (30 percent)	$ 2,880,000
Other Project Costs (Environmental, Equipment, etc.)	$ 265,000
Total Estimated Project Cost (Year 2018 Dollars)	$12,749,000
Total Estimated Project Cost (Year 2020 Dollars)	$14,056,000

The total project cost is presented in 2018 dollars. As construction of the improvements likely will not occur until the year 2020, costs have been increased by 5 percent to account for inflation.

As discussed previously, the DEQ has yet to identify a viable permit pathway. Therefore, no costs have been included in the summary of estimated costs for effluent reuse/disposal. When a viable permit pathway is selected, this Wastewater Facilities Plan (WWFP) Update will be amended to include the selected permit regulations and costs for constructing the identified reuse/disposal facility.

Preliminary Environmental Review

A preliminary environmental assessment of the selected wastewater system improvements was completed as part of this WWFP Update. A memorandum dated August 21, 2018, detailing the preliminary review is included in Appendix B. This limited environmental review is a brief collection of available information. After this cursory review, there does not appear to be any major environmental challenges currently. As the project is further developed and funding is sought, a more detailed report will be required to meet specific agency requirements.

CITY'S EXISTING EFFLUENT DISPOSAL SITE
(PERCOLATION PONDS)

EXISTING WASTEWATER TREATMENT FACILITIES

MECHANICAL WASTEWATER TREATMENT FACILITY

John

Day

River

To Mt. Vernon

U.S. HWY. 395/26

POTENTIAL PURPLE PIPE (RECLAIMED WATER) NETWORK

GREENHOUSES

JOHN DAY

U.S. HWY. 26

To Prairie City

U.S. HWY. 395

To Canyon City/Burns

T. 13 S., R. 31 E. W.M.

SCALE IN FEET

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE

SELECTED IMPROVEMENTS

FIGURE
5-1

Job# 592-25-020 Feb. 27, 2019 lbauer

CITY OF JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
SELECTED IMPROVEMENTS
PRELIMINARY COST ESTIMATE
(YEAR 2018 COSTS)

New Mechanical Wastewater Treatment Facility with Aerobic Digestion Construction	$	7,942,000
Purple Pipe Network Construction		1,662,000
Subtotal Construction Cost	**$**	**9,604,000**
Administration, Legal, Engineering, and Contingencies @ 30%		2,880,000
Total Estimated Construction Cost	**$**	**12,484,000**
Other Estimated Project Costs		
Funding Acquisition	$	30,000
Environmental Review Report		35,000
Archaeological Report		20,000
Cultural Resource Monitoring		15,000
Regulatory Agency Permitting, Reporting, and Review Fees		65,000
Biosolids Handling Truck		100,000
Subtotal Other Project Costs (2018 Dollars)	**$**	**265,000**
TOTAL ESTIMATED PROJECT COST (2018)	**$**	**12,749,000**
TOTAL ESTIMATED PROJECT COST (2020)[1]	**$**	**14,056,000**

[1]Assumes a 5 percent inflation rate.

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE

SELECTED IMPROVEMENTS
PRELIMINARY COST ESTIMATE

FIGURE
5-2

Chapter 6 - Project Financing and Implementation

Introduction

This chapter of the Wastewater Facilities Plan (WWFP) Update evaluates the financial status of the City's Sewer Department and outlines alternatives for financing John Day's proposed wastewater system improvements. A summary of state and federal funding programs is presented, including a review of funding options available to the City for the selected wastewater system improvements project. To construct the proposed improvements, a financing plan must be developed that is acceptable to the citizens of John Day. Because of the high estimated cost of the improvements, financing resources should include local funding and loan/grant funding, if available.

Although a detailed analysis of the City of John Day's current sewer rate structure is beyond the scope of this WWFP Update, some discussion of the existing rate structure, and current and future sewer system budgets, is included. As a general rule, most utility rate structures include funding for operations, periodic minor system improvements and maintenance items, payroll costs for staff, and a set-aside for future improvements. A summary of the current sewer rate structure is presented hereafter.

Current Sewer Rates and Revenue

Operation and maintenance of the existing wastewater system is financed through the City's annual budget. Revenue is obtained primarily from sewer user fees. Sewer rates that were current at the time of this WWFP Update, and became effective on January 1, 2018, are summarized on Table 6-1.

TABLE 6-1
CITY OF JOHN DAY MONTHLY SEWER RATE INFORMATION

Type of User	User Rate
Single-Family Unit and Multi-Family Units[1]	$46.00 per month
Commercial and Industrial[2]	Monthly incurred charge: 97 percent of the six winter average monthly incurred water charge plus $2.00 (i.e., total incurred water charges for November, December, January, February, March, and April divided by 6 equals the monthly average of winter-incurred charges) or Base Incurred Charges (minimum)[3]
Schools	$46.00 per month for the first 20 students plus $46.00 per month for each 20 students thereafter based on a count taken in January and September of every year, except during June, July, and August when a $46.00 minimum rate shall be applied.
Commercial Septic Tank or Port-A-Potty Dumping	$0.30 per gallon

[1] Includes, but is not limited to, duplex, triplex, fourplex, and apartments, mobile home park, and recreational vehicle park.

[2] The incurred sewer charges per month shall be either the calculated monthly incurred charge or the base incurred charge, whichever is greater as determined each year and will be effective January 1 each year.

[3] Base incurred charge (minimum)

a. $52.00 - Service stations, garages, and tire shops.

b. $62.50 - Hotels, motels, trailer or mobile home courts, apartments with four or more units, laundries, food and meat processing, and dairies.

c. $50.00 - All others; per unit.

Since the City of John Day accepts the City of Canyon City's wastewater, Canyon City pays John Day a yearly fee based on its proportionate share of operation, maintenance, and replacement (OM&R) costs and improvements costs for the wastewater treatment facility (WWTF).

A copy of the agreement between John Day and Canyon City to establish incurred sewer service and connection charges is located in Appendix C.

As of May 2018, the City of John Day billed the following number of sewer service accounts as shown on Table 6-2.

TABLE 6-2
CITY OF JOHN DAY SEWER SERVICE ACCOUNTS

Account Type	Total Number of Accounts
Residential (Single-Family Unit and Multi-Family Units)	559
Public	30
Commercial	138
Industrial	4
Government	12
TOTAL	**743**

The revenue generated from the City's sewer rates, connection fees, and from Canyon City is presented on Table 6-3. John Day's total revenue has increased at an average annual rate of 5.1 percent between 2011 and 2017. John Day has steadily increased sewer rates in $1 increments each year in anticipation of a wastewater system improvements project, and the City plans to continue this trend until a fee is established that will fund the OM&R costs, plus satisfy any debt service incurred from the wastewater system improvements project. Revenue from Canyon City has increased at an average annual rate of 13.7 percent between 2011 and 2017.

TABLE 6-3
CITY OF JOHN DAY SEWER DEPARTMENT REVENUE

Fiscal Year	Total Revenue from City of John Day Sewer Rates and Connection Fees (Operating Revenue)	Revenue from Canyon City
2011	$439,079	$24,199
2012	$432,585	$48,973
2013	$471,159	$59,995
2014	$486,820	$64,789
2015	$520,674	$52,160
2016	$547,102	$59,002
2017	$624,038	$55,356

Current Financial Status

The annual cost of operating and maintaining the John Day sewer system is summarized on Figure 6-1. The costs presented were obtained from the City's financial statements and include all costs for the wastewater system, such as OM&R, staff payroll, and existing debt service. These data are presented to provide insight into the magnitude of costs required to operate the City's existing WWTF and collection system. For funding and other financial analysis, it is recommended that the audited financial statements be reviewed prior to considering any available revenue for future debt purposes.

Historical and Projected Budget Trends

Figure 6-1 shows that over the past five years the City has generally been able to meet annual expenditures, except in year 2012. At that time, the City had a net loss of $20,485. The loss in 2012 was due in part to above average OM&R expenditures.

A graphical plot of the City of John Day's sewer system budget, showing revenue and expenditures, can be found on Figure 6-2. Generally, by plotting a "trend" line for OM&R expenditures (which include the reserve fund and capital outlay), future expenditures can be estimated assuming no changes to the sewer system occur. The City's OM&R expenditures have steadily increased over the years from a low of $366,240 in fiscal year 2011 to a high of $549,007 in 2017. The actual OM&R trend line on Figure 6-2 shows an average annual increased OM&R expenditure of approximately 6 percent. A 6 percent annual increase is considered typical for a wastewater treatment system of this type. Using a 6 percent increase equals approximately $616,864 in OM&R expenditures in fiscal year 2019-20, which should be used in future budgeting.

Existing Debt

In 2017, the City consolidated debt in the sewer fund into two loans. The first loan has an annual debt service to the sewer fund of approximately $50,128, which is scheduled to be paid off in fiscal year 2021-22. The second loan was for a land purchase (Oregon Pine Mill) that has an annual debt service to the sewer fund of $29,217 per year. This loan is scheduled to be paid off during fiscal year 2045-46.

Summary of State Funding Programs

Business Oregon Finance Programs

Community Development Block Grant Program

The primary objective of the Community Development Block Grant (CDBG) program is the development of viable (livable) urban communities by expanding economic opportunities and providing decent housing and a suitable living environment principally for persons of low and moderate income.

This is a grant program. The state receives an annual allocation from the U.S. Department of Housing and Urban Development for the CDBG program. Grant funding is subject to applicant need, availability of funds, and any other restrictions in the state's Method of Distribution (i.e., program guidelines). It is not possible to determine how much, if any, grant funds may be awarded prior to an analysis of the application and financial information.

Eligibility for the CDBG program requires a low to moderate percent income of greater than 51 percent. The City of John Day recently completed an income survey through Portland State University's Survey Research Lab, and the findings show that 57.3 percent of the residents are identified as low to moderate income. The income survey results will be valid until April 17, 2023. Therefore, the City of John Day qualifies for the CDBG program at this time.

Water/Wastewater Financing Program

This is a loan and grant program that provides for the design and construction of public infrastructure when needed to ensure compliance with the Safe Drinking Water Act (SDWA) or the Clean Water Act (CWA). To be eligible, a system must have received, or is likely to soon receive, a Notice of Non-Compliance by the appropriate regulatory agency associated with the SDWA or CWA.

While primarily a loan program, grants are available for municipalities that meet the eligibility criteria. The loan/grant amounts are determined by a financial analysis of the applicant's ability to afford a loan (debt capacity, repayment sources, current and projected utility rates, and other factors). One criterion utilized by Business Oregon finance programs is an affordability index rate. The affordability index rate is calculated by taking a City's median household income (MHI), multiplying it by 1.25 percent, and dividing by 12 months to obtain an estimated monthly cost. The calculated cost is assumed to be what the users in the community can afford to pay in utility charges. The affordability index is often utilized as a minimum threshold for eligibility for grants and low interest loans.

The maximum loan term for this program is usually 25 years or the useful life of the infrastructure financed, whichever is less. Loan amounts are determined by financial review and may be offered through a combination of direct and/or bond funded loans. Loans are generally repaid with utility revenues or voter-approved bond issues. A limited tax general obligation pledge may also be required. "Creditworthy" applicants may be funded through the sale of state revenue bonds.

The maximum grant available through the Water/Wastewater Financing Program is $750,000 per project based on a financial analysis. To qualify for grants, the sewer rate would need to be 115 percent of the City's affordability index rate. The City's current affordability index rate is $34.66. The current interest rate is approximately 3.5 to 4 percent with a 25-year loan term. The Water/Wastewater program is a potential funding source for the City, though higher interest rates and a shorter loan term may substantially increase user rates if only Water/Wastewater financing is utilized.

Special Public Works Fund

The Special Public Works Fund program was established by the Oregon Legislature in 1985 to provide primarily loan funding for municipally owned infrastructures and other facilities that support economic and community development in Oregon. Loans and grants are available to municipalities for planning, designing, purchasing, improving, and constructing municipally owned facilities.

For design and construction projects, loans are primarily available; however, grants are available for projects that will create and/or retain traded-sector jobs. A traded-sector industry sells its goods or services into nationally or internationally competitive markets. Loans range in size from less than $100,000 to $10 million. The Special Public Works Fund is able to offer very attractive interest rates that reflect tax-exempt market rates for very good quality creditors. Loan terms can be up to 25 years or the useful life of the project, whichever is less. Grants are limited to projects associated with job creation/retention. The maximum grant award is $500,000 or 85 percent of the project cost, whichever is less. The grant amount per project is based on up to $5,000 per eligible job created or retained. Since job creation or retention is a primary goal of the City's selected improvements project (via greenhouses and the Innovation Gateway), the Special Public Works Fund may be a viable option for the City.

For Business Oregon Programs - Contact Regional Development Officer

Since program eligibility and funds availability may change from year to year, potential applicants are encouraged to contact their respective regional development officer to obtain the most accurate and up-to-date information for each program.

Clean Water State Revolving Fund Loan Program

This program, administered by the Oregon Department of Environmental Quality (DEQ), provides low interest rate loans to public agencies for the planning, design, and construction of various projects that prevent or mitigate water pollution (e.g., WWTFs), as well as for some publicly owned estuary management and non-point source control projects. Priority in the agency's ranking process is always given to projects addressing documented water quality problems and health hazards.

Under the Clean Water State Revolving Loan Fund (CWSRF) program rules, interest rates change quarterly based on a percentage of the national municipal bond rate. These percentages vary from 25 to 55 percent of the bond rate depending on the length of the repayment period. In 2017, loans for design and construction for small communities had an interest rate that varied from 1 to 2 percent with repayment over 20 years, depending on the MHI and other factors. In addition, fees are assessed to cover program administration costs by the DEQ. A servicing fee of 0.5 percent of the

outstanding balance is added to the interest rate, and a loan reserve equal to 50 percent of the annual debt service is also to be set aside in a separate fund. This program typically provides approximately $50 million annually for funding projects, with a maximum of 15 percent of the monies going to any one applicant. This program has low interest rates with variable repayment periods. This program has also recently implemented measures for principal forgiveness to be allocated to cities in combination with loans. The DEQ CWSRF program may be a low interest loan and potential principal forgiveness source for the City of John Day.

Summary of Federal Grant and Loan Programs

Rural Development

Rural Development (RD) can provide financial assistance to communities with a population of less than 10,000 through both loans and direct grants. Under the loan program, the agency purchases local bonds. The interest rate for these bonds is dependent on the MHI of the community and other factors, and varies from year to year based on other economic factors nationally. The market interest rate varies but has recently been between approximately 2.5 and 3.5 percent with a repayment period of up to 40 years. Applying for this type of funding is a fairly lengthy process involving development of an environmental report and a detailed funding application.

RD presently requires communities to establish average residential user costs in the range of similar systems with similar demographics. According to RD staff, the most recent sewer user cost requirements have been approximately $45 to $50 per month before a community qualifies for grant funds. It should be noted that loans without grant funds may be acquired from RD that may not require rates to reach this level, depending on the results of an RD funding analysis. The user costs must provide sufficient revenue to pay for all system OM&R costs and pay for the local debt service incurred as a result of the project. All project costs above this level may be paid for by grant funds, up to given limits, which are typically in the 25 percent of total project cost range and usually not more than 45 percent of the total project cost. The objective of the RD loan/grant program is to keep the cost for utilities in small, rural communities at a level similar to what other communities are paying.

Another of the agency's requirements is that loan recipients establish a reserve fund of 10 percent of the bond repayment during the first 10 years of the project, which can make the net interest rate higher. The RD program requires either revenue or general obligation bonds be established through the agency for the project (refer to the Local Financing Options section of this chapter for further discussion). These bonds can usually be purchased for a period of 40 years if grant funding is also received. A loan from RD may be an option for the City to implement wastewater system improvements.

U.S. Economic Development Administration

The U.S. Economic Development Administration (EDA) has grants and loan funds similar to those available through Business Oregon's Special Public Works Fund program. Monies are available to public agencies to fund projects that stimulate the economy of an area, and the overall goal of the program is to create or retain jobs. The EDA helps fund public works improvement projects in areas where new industries are locating or plan to locate in the future. In addition, the agency has a program known as the Public Works Impact Program to fund projects in areas with extremely high

rates of unemployment. This program is targeted toward creating additional jobs and reducing the unemployment rate in the area.

Other Funding Sources

Oregon Water Resources Department

In 2013, the Oregon Legislature approved Senate Bill 839 establishing the Water Supply Development Account to provide loans and grants for water development projects that have economic, environmental, and social/cultural benefits. The Oregon Water Resources Department (OWRD) may award loans and grants to evaluate, plan, and develop in-stream and out-of-stream water development projects approved by the Water Resources Commission. Grants will require a 25 percent cost-share match, which may include in-kind contributions. The purple pipe network qualifies as an eligible project for OWRD funding.

New Market Tax Credit

The New Market Tax Credit (NMTC) was authorized in the Community Renewal Tax Relief Act of 2000 (PL 106-554) as part of a bipartisan effort to stimulate investment and economic growth in low-income urban neighborhoods and rural communities that lack access to the capital needed to support and grow businesses, create jobs, and sustain healthy local economies.

The purpose of the NMTC program is to attract capital to low-income communities by providing private investors with a federal tax credit for investments made in businesses or economic development projects located in some of the most distressed communities in the nation: census tracts where the individual poverty rate is at least 20 percent or where median family income does not exceed 80 percent of the area median.

A NMTC investor receives a tax credit equal to 39 percent of the total Qualified Equity Investment made in a Community Development Entity and the credit is realized over a seven-year period, 5 percent annually for the first three years and 6 percent in years four through seven. If an investor redeems a NMTC investment before the seven-year term has run its course, all credits taken to date will be recaptured with interest.

Funding Summary

Business Oregon's CDBG and Water/Wastewater program, the DEQ's CWSRF program, OWRD, the NMTC, and RD appear to be the most attractive funding sources for the City's wastewater system improvements project. These programs appear to be funding sources that can provide the needed funds to potentially make the proposed improvements financially feasible for the City.

It is important for the City to consult with funding agencies early in the project development stages to understand which funding programs would provide the most attractive funding package for the proposed improvements. This consultation with funding agencies began during a First Stop meeting held at the City's Fire Station in November of 2017 facilitated by Rural Community Assistance Corporation. The agencies that attended included the DEQ, Business Oregon, and RD. Items of discussion during the First Stop meeting were the City's vision to turn its wastewater into an asset, potential permitting requirements, and potential funding sources. The next discussion on funding

wastewater improvements will be done at a One Stop meeting, which is described in more detail later in this section. The remainder of this section focuses on evaluating loan capacities and funding options for the City's wastewater system improvements project, assuming the project is funded with only a loan and considering the programs' eligibility criteria described above.

It appears that more than one funding source is available to the City. However, most agencies require a sewer rate that will support a loan for wastewater system improvements, both as a condition of receiving monies and prior to being considered for grant funds. It should be noted that the monthly user rates discussed in this section can represent a combination of monthly usage fees and taxes.

It is important for the City to consult with funding agencies early in the project development stages to ascertain under which funding programs the City would be eligible to receive funding for their proposed improvements. This consultation with funding agencies may be done at a One Stop Meeting, which is described in more detail later in this chapter. The remainder of this chapter focuses on evaluating loan capacities and funding options for the City's wastewater system improvements project.

Preliminary Equivalent Residential Unit Analysis

When projecting future revenue for a wastewater system, an equivalent residential unit (ERU) analysis is usually completed. One ERU is intended to represent the average residential wastewater flow for a "typical" user. As an example, each residential connection in John Day would represent one ERU. A commercial or industrial connection user with wastewater flows similar to the average residential flow would also be considered one ERU. A commercial connection such as a café, with three times the typical wastewater flows as an average residential sewer connection, would be considered three ERUs.

The City's sewer service accounts, as of May 2018, were analyzed to provide a preliminary ERU determination. Table 6-4 summarizes the results of the preliminary ERU analysis.

TABLE 6-4
CITY OF JOHN DAY PRELIMINARY ERU ANALYSIS

Connection Type	Total Number of Connections	Estimated ERUs
Residential (Single-Family Unit and Multi-Family Units)	559	559
Public	30	90
Commercial	138	306
Industrial	4	12
Government	12	36
TOTAL	**743**	**1,003**

Based on the ERU analysis above, the City of John Day has 743 sewer system connections that represent approximately 1,003 ERUs. Most funding agencies will use this type of ERU evaluation as a basis for estimating future yearly revenues and debt capabilities for a city. The ERU determination is intended to equitably distribute wastewater system costs among all users. The ERU determination helps funding agencies determine the maximum loan (debt) amount a city can incur prior to being considered for grant funds for their wastewater system project. The City of John Day will need both loan and grant funds to complete the wastewater system improvements project discussed in Chapter 5, should the City wish to do so. The analysis presented hereafter for the City's future sewer rate revenue and estimated

loan capacity is based on the preliminary determination of 1,003 ERUs, not the current estimate of 743 connections.

Debt Capacity

To determine the City's ability to fund a wastewater system improvements project, Figure 6-3 was prepared. Several assumptions were made:

1. Wastewater user revenue is based on the preliminary determination of 1,003 ERUs.

2. Wastewater system expenditures for the budget year 2019-20 were set at $616,864 per year. The budget year 2019-20 was used because this is estimated to be the time period in which construction would be completed if the project is pursued immediately upon completion of this WWFP Update.

3. Future debt service was calculated based on a Water/Wastewater funding program loan with 4.0 percent interest for a 25-year repayment period, a CWSRF loan at 3.0 percent interest for a 20-year repayment period, and RD financing of 4.0 percent interest (at a lower poverty-based interest rate) for a 40-year repayment period, depending on which financing program is best suited to assist the City.

4. Figure 6-3 shows John Day's loan capacity and total loan capacity assuming Canyon City continues to follow the historic contribution of approximately 10 percent of the John Day's revenue. John Day's loan capacity is how much the City has factored in the anticipated contributions from Canyon City. The total loan capacity shown on Figure 6-3 considers the combined John Day/Canyon City anticipated loan capacity with 90 percent of monies coming from John Day and 10 percent coming from Canyon City.

5. It is important to note the estimated loan capacities shown on Figure 6-3 are based on the current estimate of 1,003 ERUs. These figures may need to be verified as project funding proceeds. It should be recognized that this is only a preliminary analysis, and the financial assumptions and figures presented in this WWFP Update should be refined as project implementation proceeds in the future and as agreements are made with funding agencies.

The data shown on Figure 6-3 provides a general idea of the amount of debt the City could service at various monthly wastewater costs. The total project cost of the selected wastewater improvements is estimated to be $12,749,000 (see Chapter 5). Assuming Canyon City pays 10 percent of the capital cost, John Day's portion of the project would be approximately $11,474,700. As shown on Figure 6-3, a wastewater rate of $70 per month would fund only a portion of the project with a loan. Given that the current sewer rate is $46 per month, a $24 per month rate hike is not feasible. Therefore, it is important for the City to pursue potential grant funds or loan forgiveness to assist with project financing.

Project Funding Options

Based on the estimated cost of the John Day wastewater system improvements project, the City will need to obtain a low interest loan coupled with a grant, if available, to fund the desired improvements project. As an improvements project is pursued, it is recommended that the City thoroughly investigate potential funding sources to ensure the best funding package is obtained for the project.

One Stop Meeting and Project Intake Form

The Business Oregon One Stop meeting process allows the City to develop various funding scenarios. In the past, the City of John Day would have needed to schedule a One Stop meeting in Salem, where representatives of major funding agencies would have met with the City to discuss the project and funding needs and identify the funding program best suited for the project. To avoid requiring City representatives to travel to Salem, Business Oregon has the option to schedule One Stop meetings in the area of the project or can complete these meetings via conference call and a web computer connection to visually demonstrate funding scenarios.

The City needs to attend a One Stop meeting. At the meeting, various funding scenarios will be explored with Business Oregon, the DEQ, and RD. The meeting will provide the City with financial information needed to make an informed decision on selecting a funding source or sources for the proposed improvements.

Local Financing

Regardless of the ultimate project scope and agency from which loan and grant funds are obtained, the City may need to develop authorization to incur debt (i.e., bonding) for the needed project improvements. The need to develop authorization to incur debt depends on funding agency requirements and provisions in the City Charter. RD requires a city to obtain authorization to incur debt.

There are generally two options a city may use for its bonding authority: general obligation bonds and revenue bonds. General obligation bonds require a vote of the people to give the City the authority to repay the debt service through tax assessments, wastewater rate revenues, or a combination of both. The taxing authority of the City provides the guarantee for the debt. Revenue bonds are financed through revenues of the wastewater system. Authority to issue revenue bonds can come in two forms. One would be through a local bond election similar to that needed to sell a general obligation bond, and the second would be through City Council action authorizing the sale of revenue bonds if the City Charter allows. If citizens do not object to the bonding authority resolution during a 60-day remonstrance period, the City would have authority to sell these revenue bonds.

The RD program accepts either revenue bonds or general obligation bonds. Bonding is not required for the Business Oregon and CWSRF programs. Due to current tax measure limitations in the state of Oregon, careful consultation with experienced, licensed bonding attorneys needs to be made if the City of John Day begins the process of obtaining bonding authority for the proposed wastewater system improvements. It would be wise for the City to consult their City Charter and attorney to see if debt for the wastewater system can be assumed.

Project Implementation

The following action items and implementation steps need to be made by the City of John Day if they desire to implement a wastewater system improvements project. The steps outlined are general in nature and include the major steps that need to be undertaken.

Action Items

1. Formally adopt the WWFP Update.

2. Consult with funding agencies to ensure the best funding package is obtained for the project.

3. Prepare funding applications for the wastewater system improvements project.

4. Decide how to obtain the authorization to incur debt for the wastewater system improvements project. Once decided (revenue bond or general obligation bond), a bond attorney should be consulted, and the appropriate resolution paperwork should be prepared and considered for implementation.

5. Hold public information meetings to inform its citizens of the needs and scope of the project, to answer questions, and to generate support for a potential sewer rate increase.

Implementation Steps

Should the City wish to proceed with a wastewater system improvements project, the following Implementation Plan outlines the key steps the City would need to undertake to proceed with project implementation.

Item No.	ITEM	COMPLETION DATE
1.	Initiate funding discussions with funding agencies.	June 2018
2.	Adopt the WWFP Update.	Spring 2019
3.	Initiate design.	Spring 2019
4.	Consult with funding agencies as necessary and complete and submit the applications as necessary.	Fall 2019
5.	Finalize project funding.	Winter 2019
6.	Complete project design.	Winter 2019
7.	Bid and award construction contract.	Spring 2020
8.	Start project construction.	Spring 2020
9.	Complete project construction.	Fall 2021
10.	Close out project.	Winter 2021

The key to implementing part or all of the John Day wastewater system improvements project, as outlined in this chapter, is the ability of the City to acquire a low-interest loan coupled with grant funding. The City will have to work closely with its citizens to inform them of the system needs and the necessity for increased sewer user costs. Depending on the scope of improvements, the City will need to plan on average user costs being increased to at least $50 to $70 per month, or annual property taxes increasing by approximately $6 to $8 per $1,000 of tax assessed value (or some combination of the two), to obtain the loan and grant funds required to complete the project. Rates may be higher than this depending on the amount of grant funds available. Participation from Canyon City is vital for the City of John Day to be able to fund the selected alternative discussed in Chapter 5.

Wastewater system improvements as outlined in this WWFP Update will provide the City with a reliable, quality wastewater system that will meet the needs of the City for many years to come. The new

system will be easier to operate, will be able to provide nitrate treatment, and will also require less maintenance.

CITY OF JOHN DAY, OREGON
HISTORICAL SEWER AND JOINT SEWER FUND SUMMARY
FISCAL YEARS 2011 THROUGH 2017

Fiscal Year	Operating Revenue	From Canyon City	Non-Operating Revenue	Transfers to Reserve	Materials and Services	Capital Outlay (Equipment)	Personnel Services	Motor Pool	Employee Benefits	Total OM&R Expenditures	Debt Services	Total Expenditures	Net Income Gain/(Loss)
2011	$439,079	$24,199	$359	$38,395	$110,623	$0	$145,763	$0	$71,459	$366,240	$70,155	$436,395	$ 27,242
2012	$432,585	$48,973	$250	$36,550	$118,864	$0	$156,766	$40,000	$79,958	$432,138	$70,155	$502,293	$ (20,485)
2013	$471,159	$59,995	$228	$13,707	$129,139	$926	$146,785	$40,000	$83,182	$413,739	$70,155	$483,894	$ 47,488
2014	$486,820	$64,789	$373	$40,322	$127,911	$0	$130,396	$40,000	$74,543	$413,172	$74,755	$487,927	$ 64,055
2015	$520,674	$52,160	$3,153	$40,282	$145,321	$10,178	$148,133	$45,000	$85,294	$474,208	$74,755	$548,963	$ 27,024
2016	$547,102	$59,002	$865	$31,710	$152,118	$0	$170,088	$45,000	$83,981	$482,897	$74,754	$557,651	$ 49,318
2017	$624,038	$55,356	$1,290	$66,950	$167,941	$0	$176,929	$45,000	$92,187	$549,007	$79,354	$628,361	$ 52,323

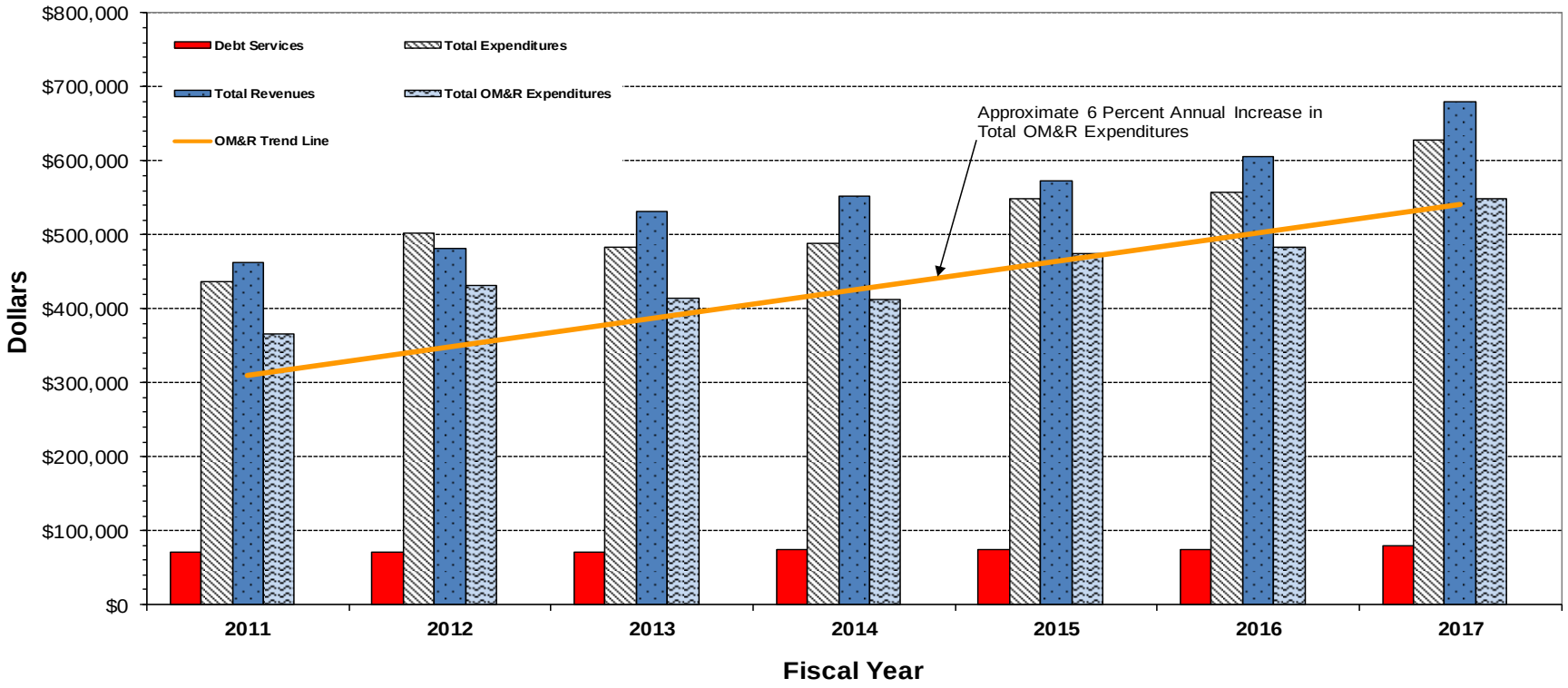
OM&R = Operation, Maintenance, and Replacement

anderson perry & associates, inc.

CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
HISTORICAL SEWER AND JOINT SEWER FUND SUMMARY

FIGURE
6-1

City of John Day, Oregon
Historical Sewer and Joint Sewer Department Funds



OM&R = operation, maintenance, and replacement

anderson perry & associates, inc.

CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE
HISTORICAL SEWER AND JOINT SEWER DEPARTMENT FUNDS

FIGURE
6-2

CITY OF JOHN DAY, OREGON
PRELIMINARY SEWER RATE ANALYSIS FOR LOAN CAPACITY
2019-20 BUDGET YEAR

RATE[1]		REVENUE		EXPENDITURES			FINANCING OPTIONS		
Meter Charge (per month)	Total ERU	Canyon City Revenue[2]	Total Revenue[3]	Estimated OM&R Costs[4]	Existing Debt Service[5]	Revenue Available for Future Debt Service[6]	RD Loan Capacity[7]	Typical Business Oregon Loan Capacity[8]	CWSRF Disadvantaged Community Capacity[9]
$ 46.00	1,003	$ 61,686	$ 615,342	$ 616,864	$ 83,817	-	-	-	-
47.00	1,003	61,686	627,378	616,864	83,817	-	-	-	-
48.00	1,003	61,686	639,414	616,864	83,817	-	-	-	-
49.00	1,003	61,686	651,450	616,864	83,817	-	-	-	-
50.00	1,003	61,686	663,486	616,864	83,817	-	-	-	-
51.00	1,003	61,686	675,522	616,864	83,817	-	-	-	-
52.00	1,003	61,686	687,558	616,864	83,817	-	-	-	-
53.00	1,003	61,686	699,594	616,864	83,817	-	-	-	-
54.00	1,003	61,686	711,630	616,864	83,817	10,949	195,000	149,000	163,000
55.00	1,003	61,686	723,666	616,864	83,817	22,985	409,000	312,000	342,000
56.00	1,003	61,686	735,702	616,864	83,817	35,021	624,000	476,000	521,000
57.00	1,003	61,686	747,738	616,864	83,817	47,057	838,000	640,000	700,000
58.00	1,003	61,686	759,774	616,864	83,817	59,093	1,053,000	803,000	879,000
59.00	1,003	61,686	771,810	616,864	83,817	71,129	1,267,000	967,000	1,058,000
60.00	1,003	61,686	783,846	616,864	83,817	83,165	1,481,000	1,130,000	1,237,000
61.00	1,003	61,686	795,882	616,864	83,817	95,201	1,696,000	1,294,000	1,416,000
62.00	1,003	61,686	807,918	616,864	83,817	107,237	1,910,000	1,457,000	1,595,000
63.00	1,003	61,686	819,954	616,864	83,817	119,273	2,125,000	1,621,000	1,774,000
64.00	1,003	61,686	831,990	616,864	83,817	131,309	2,339,000	1,785,000	1,954,000
65.00	1,003	61,686	844,026	616,864	83,817	143,345	2,553,000	1,948,000	2,133,000
66.00	1,003	61,686	856,062	616,864	83,817	155,381	2,768,000	2,112,000	2,312,000
67.00	1,003	61,686	868,098	616,864	83,817	167,417	2,982,000	2,275,000	2,491,000
68.00	1,003	61,686	880,134	616,864	83,817	179,453	3,197,000	2,439,000	2,670,000
69.00	1,003	61,686	892,170	616,864	83,817	191,489	3,411,000	2,602,000	2,849,000
70.00	1,003	61,686	904,206	616,864	83,817	203,525	3,625,000	2,766,000	3,028,000

CWSRF = Clean Water State Revolving Fund
ERU = equivalent residential unit
OM&R = operation, maintenance, and replacement
RD = Rural Development

Notes:

[1] The current residential base wastewater rate is $46.00 per month per ERU. Commercial accounts have been estimated as 2.2 ERUs. Actual commercial income will vary.

[2] Estimated revenue from Canyon City using a historical contribution trend of 15 percent coming from Canyon City.

[3] Revenue is based on the 2016-17 fiscal year number of wastewater ERUs.

[4] Estimated OM&R cost for the 2019-20 budget year.

[5] See Chapter 7 for further discussion.

[6] Revenue available for future debt service = total revenue - estimated OM&R costs - existing debt service.

[7] Assumes loan funding at 4 percent for 40 years (loan capacity determined after 10 percent reserve payment removed from revenue available for debt service). Values rounded to nearest $1,000.

[8] Assumes loan funding at 4 percent for 20 years. Values rounded to the nearest $1,000.

[9] Assumes loan funding at 3 percent for 20 years. Values rounded to the nearest $1,000.

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CITY OF
JOHN DAY, OREGON
WASTEWATER FACILITIES PLAN UPDATE

PRELIMINARY SEWER RATE ANALYSIS FOR LOAN CAPACITY

FIGURE 6-3

Appendices Table of Contents

APPENDIX A
Water Pollution Control Facilities
Permit No. 102481

WATER POLLUTION CONTROL FACILITIES PERMIT

Department of Environmental Quality
700 S.E. Emigrant, Suite 330, Pendleton, OR 97801
Telephone: (541) 276-4063

Issued pursuant to ORS 468B.050

ISSUED TO:

City of John Day
450 East Main
John Day, OR 97845

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Domestic Wastewater	001	Evaporation and Percolation Ponds
Biosolids	002	Land Application

PLANT TYPE AND LOCATION:

Trickling Filter and
Four Percolation Ponds
John Day, Oregon

RECEIVING SYSTEM INFORMATION:

Basin: John Day
Sub-Basin: Upper John Day
Hydro Code: 26=JOHN 248.0 A
County: Grant

Treatment System Class: III
Collection System Class: II

Nearest surface stream that would receive waste if facility were to discharge: John Day at RM 248.0

Issued in response to Application No. 989386 received April 26, 2000.

This permit is issued based on the land use findings in the permit record.

Barbara D. Sellars, Water Quality Manager
Eastern Region

March 29, 2002
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify, or operate a wastewater collection, treatment, control and disposal system in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

Unless specifically authorized by this permit, by another NPDES or WPCF permit, or by Oregon Administrative Rule, any other direct or indirect discharge to waters of the state is prohibited, including discharge to an underground injection control system.

SCHEDULE A

Waste Discharge Limitations not to be Exceeded after Permit Issuance.

1. The City of John Day is authorized to operate a trickling filter treatment facility with effluent disinfection and disposal through evaporation and percolation using four slow sand filter percolation ponds. The approved average dry weather design flow for the facility is 0.60 MGD.

2. All wastewater shall be managed and disposed in a manner that will prevent:

   a. A violation of Groundwater Quality Protection Rules (OAR 340-040); and

   b. A violation of any permit-specific groundwater concentration limits, established pursuant to OAR 340-040-0030, which have been subsequently incorporated into the permit.

3. Outfall Number 001 (Evaporation and Percolation Ponds)

   a. No discharge to state waters is permitted. All treated wastewater shall be treated, disinfected, and disposed in four slow sand filter percolation ponds. Raw or inadequately treated sewage shall not be discharged to the percolation ponds. The percolation ponds shall be operated as follows:

      (1) The ponds shall not be allowed to overflow;

      (2) Effluent shall be discharged into the ponds so that all ponds receive approximately the same quantity of treated effluent per unit area of pond;

      (3) If an organic mat reduces the seepage from the pond bottoms, the organic matter shall be removed and the pond bottom disked lightly to restore seepage and prevent overfilling; and

      (4) Adverse impact on existing or potential beneficial uses of groundwater is not allowed.

   b. Wastewater effluent from the trickling filter treatment plant shall be disinfected to maintain a minimum daily average chlorine residual of 1.0 mg/l on a monthly basis.

   c. The BOD5 percent removal efficiency for the trickling filter treatment plant shall not be less than 85% monthly average.

4. Outfall Number 002 (Biosolids Land Application and Management)

   a. Biosolids land application and management will comply with Oregon biosolids rules and guidelines including OAR 340-050 and all other applicable statutes, rules, and federal regulations.

   b. Prior to land application, the biosolids shall meet one of the vector attraction reduction standards required under 40CFR 503.33(a)(1).

   c. Prior to land application, the biosolids shall meet one of the three pathogen reduction standards required under 40CFR 503.32(b).

d. Public access to field sites shall be restricted for at least 12 months after biosolids land spreading has ceased.

e. A 50-feet minimum (300-feet minimum if biosolids gun application is used) setback shall be maintained between biosolids application areas and all highways, public roadways, and property lines.

f. Land application activities shall be conducted in accordance with the approved biosolids management plan.

5. The Department may reopen this permit, if necessary, to include groundwater parameters, concentration limits, and compliance points based on groundwater monitoring or other information.

SCHEDULE B

1. Minimum Monitoring and Reporting Requirements
(unless otherwise approved in writing by the Department)

a. Influent

Item or Parameter	Minimum Frequency	Type of Sample
pH	3/Week	Grab
BOD5	2/Week	Composite 1/
TSS	2/Week	Composite 1/

b. Outfall Number 001 (Evaporation and Percolation Ponds)

Item or Parameter	Minimum Frequency	Type of Sample
Total Flow (MGD)	Daily	Totalizer
Flow Meter Calibration	1 per 5 Years	Verification
BOD5	2/Week	Composite 1/
TSS	2/Week	Composite 1/
pH	3/Week	Grab
Quantity Chlorine Used	Daily	Measurement
Chlorine Residual	Daily	Grab
TKN	Quarterly	Grab
NO_2+NO_3-N	Quarterly	Grab
Total Dissolved Solids	Quarterly	Grab
Average Percent Removed (BOD5 and TSS)	Monthly	Calculation

c. Outfall 002 (Biosolids Land Application)

Item or Parameter	Minimum Frequency	Type of Sample
Biosolids Analyses including: Total solids (%dry weight) Volatile solids (% dry weight) pH (standard units) Biosolids nitrogen for: NH4-N; NO3-N; & TKN (% dry weight) Total phosphorus (% dry weight) Potassium (% dry weight) Biosolids trace pollutants for: As, Cd, Cu, Hg, Mo, Ni, Pb, Se, & Zn (measured as total in mg/kg)	Annually	Composite sample to be representative of the product to be land applied from the digester (See Note 3/)

Item or Parameter	Minimum Frequency	Type of Sample
Record of % volatile solids reduction accomplished through digestion	Monthly	Calculation (See note 4/)
Record of locations Where biosolids are applied on each DEQ authorized land application site. (Site location maps are to be maintained at the treatment facility for review upon request by DEQ)	Each occurrence	Date, quantity (dry tons, gallons/cubic yards), and locations where biosolids were applied, recorded on site location map.

d. Groundwater Monitoring Resampling Requirements

If monitoring indicates that a concentration limit has been exceeded at a compliance point, the permittee shall notify the Department within 10 days and shall immediately resample the monitoring well. The results of both sampling events shall be reported to the Department within 10 days of receipt of the laboratory data.

If monitoring indicates a significant increase (increase or decrease for pH) in the value of a parameter monitored, the permittee shall immediately resample unless otherwise approved in writing by the Department. If the resampling confirms a change in water quality, the permittee shall:

(1) Report the results to the Department within 10 days of receipt of the laboratory data; and

(2) Prepare and submit to the Department within 30 days a plan for developing a preliminary assessment unless another time schedule is approved by the Department.

Notes: 1/ Composite samples shall consist of no less than 6 samples collected over a 24-hour period and apportioned according to the volume of flow at the time of sampling.

2/ Composite samples shall consist of at least 6 samples collected over an 8-hour period, between 6 a.m. and 6 p.m., and apportioned according to the volume of flow at the time of sampling.

Composite samples from the drying beds shall consist of blending equal fractions of grab samples taken from the center of four or more like-sized units resulting from an imaginary grid of each section of the drying beds being harvested. The grab samples taken from the center of each grid shall include the entire depth of sludge in the area sampled. Samples shall be composited and mixed in equal portions. The sampling locations should be spaced to get samples from all parts of the drying beds.

Composite samples from the digester withdrawal line shall consist of at least six aliquots of equal volume collected over the daily scheduled hauling period and combined.

Inorganic pollutant monitoring shall be conducted according to **Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,** Second edition (1982) with Updates I and II and third Edition (1986) with Revision I.

4/ Calculation of the % volatile solids reduction is to be based on comparison of a representative sample of total and volatile solids entering the digester (a weighted blend of the primary and

secondary clarifier solids) and a representative composite sample of solids exiting the digester withdrawal line (as defined in Note 3/ above).

2. Reporting Procedures

Monitoring results shall be reported on approved forms. The reporting period is the calendar month. Reports must be submitted to the Department's Eastern Region Pendleton Office by the 15th day of the following month.

State monitoring reports shall identify the name, certificate classification and grade level of each principal operator designated by the permittee as responsible for supervising the wastewater collection and treatment systems during the reporting period. Monitoring reports shall also identify each system classification as found on page one of this permit.

Monitoring reports shall also include a record of all applicable equipment breakdowns and bypassing.

3. Biosolids Reporting

An annual biosolids report shall be submitted to the Department by February 19 of each year that describes solids handling activities for the previous year and includes, but is not limited to, the required information outlined in OAR 340-050-0035(6)(a) – (e).

4. Groundwater Reopener

Upon Department approval of the Groundwater Monitoring Plan as required in Schedule C of this permit, the Department may reopen this permit, if necessary, to include the following groundwater monitoring requirements: parameters, sampling methodologies, sampling frequencies, and background, detection, and compliance monitoring wells. Upon Department approval of the Groundwater Monitoring Plan, groundwater monitoring shall be conducted in accordance with the approved plan until this permit is renewed or modified to include specific monitoring requirements.

SCHEDULE C

Compliance Conditions and Schedules

1. By no later than twelve (12) months from the date of issuance of this permit, the permittee shall submit a groundwater monitoring plan for Department review and approval. After written approval of the groundwater monitoring plan, the permittee shall implement the plan and begin groundwater monitoring.

2. Within six (6) months after the collection of nine sets of groundwater quality and level data, the permittee shall submit a report analyzing the data. The report shall include a determination of background groundwater quality, existing or potential impacts, and background and compliance wells. Based on the results of the report, the permittee shall either: 1) propose permit specific concentration limit(s); or 2) apply for a concentration limit variance. Upon approval of the concentration limit(s) or granting of the concentration limit variance, the permit will be modified to include the permit specific concentration limit(s).

   The need for ongoing groundwater monitoring, and/or treatment disposal system improvements will be evaluated by the Department. Should the data indicate that the discharge to groundwater poses a significant threat, corrective actions and/or additional monitoring requirements shall be incorporated into the permit by addendum.

3. The permittee is expected to meet the compliance dates which have been established in this schedule. Either prior to or no later than 14 days following any lapsed compliance date, the permittee shall submit to the Department a notice of compliance or noncompliance with the established schedule. The Director or his authorized representative may revise a schedule of compliance if he determines good and valid cause resulting from events over which the permittee has little or no control.

SCHEDULE D

Special Conditions

1. An adequate contingency plan for prevention and handling of spills and unplanned discharges shall be in force at all times. A continuing program of employee orientation and education shall be maintained to ensure awareness of the necessity of good in-plant control and quick and proper action in the event of a spill or accident.

2. All biosolids shall be managed in accordance with the current, Department approved biosolids management plan and the site authorization letters issued by the Department. The permittee shall update the current biosolids management plan and submit it to the Department for review and approval by no later than nine (9) months after permit issuance. The permittee shall provide opportunity for comments on the draft plan for at least 30 days through public notice and shall incorporate revisions as needed prior to submittal to the Department. Any changes in solids management activities that significantly differ from the operations specified under the approved plan require the prior written approval of the Department. When appropriate, the permittee shall submit any necessary revisions to the current biosolids management plan for Department review and approval.

   All new biosolids application sites shall meet the site selection criteria set forth in OAR 340-050-0070. The currently approved site is located in Grant County. No new public notice is required for the continued use of the currently approved site. Property owners adjacent to any newly approved application sites shall be notified, in writing or by any method approved by the Department, of the proposed activity prior to the start of application. For proposed new application sites that are deemed by the Department to be sensitive with respect to residential housing, runoff potential or threat to groundwater, an opportunity for public comment shall be provided in accordance with OAR 340-050-0030.

3. The permittee shall comply with Oregon Administrative Rules (OAR), Chapter 340, Division 049, "Regulations Pertaining To Certification of Wastewater System Operator Personnel" and accordingly:

   a. The permittee shall have its wastewater system supervised by one or more operators who are certified in a classification and grade level (equal to or greater) that corresponds with the classification (collection and /or treatment) of the system to be supervised as specified on page one of this permit. The permittee may contract for part-time supervision in accordance with OAR 340-049-0015(3) and 340-049-0070.

Note: A "supervisor" is defined as the person exercising authority for establishing and executing the specific practice and procedures of operating the system in accordance with the policies of the permittee and requirements of the waste discharge permit. "Supervise" means responsible for the technical operation of a system, which may affect its performance or the quality of the effluent produced. Supervisors are not required to be on-site at all times.

   b. The permittee's wastewater system may not be without supervision (as required by Special Condition 3 a. above) for more than thirty (30) days. During this period, and at any time that the supervisor is not available to respond on-site (i.e. vacation, sick leave or off-call), the permittee must make available another person who is certified in the proper classification and at grade level I or higher.

c. The permittee is responsible for ensuring the wastewater system has a properly certified supervisor available at all times to respond on-site at the request of the permittee and to any other operator.

d. The permittee shall notify the Department of Environmental Quality in writing within thirty (30) days of replacement or redesignation of certified operators responsible for supervising wastewater system operation. The notice shall be filed with the Water Quality Division, Operator Certification Program (811 SW Sixth, Portland, OR 97204). This requirement is in addition to the reporting requirements contained under Schedule B of this permit

e. Upon written request, the Department may grant the permittee reasonable time, not to exceed 120 days, to obtain the services of a qualified person to supervise the wastewater system. The written request must include justification for the time needed, a schedule for recruiting and hiring, the date the system supervisor availability ceased and the name of the alternate system supervisor(s) as required by 3 b. above.

4. The permittee shall notify the DEQ Eastern Region, Pendleton Office, (541) 276-4063, in accordance with the response times noted in the General Conditions of this permit, of any malfunction so corrective action can be coordinated between the permittee and the Department.

5. The permittee shall manage and maintain all groundwater monitoring wells as follows:

a. The permittee shall protect and maintain each groundwater monitoring well so that samples collected are representative of actual conditions.

b. All monitoring well abandonments, replacements, repairs, and installations must be conducted in accordance with the Water Resources Department Oregon Administrative Rules, Chapter 690, Division 240, and with the Department's guidance "Groundwater Monitoring Well Drilling, Construction, and Decommissioning", dated August 22, 1992. All monitoring well abandonments, replacements, repairs, and installations must be documented in a report prepared by an Oregon registered geologist.

c. If a monitoring well becomes damaged or inoperable, the permittee shall notify the Department in writing within 14 days of when the permittee becomes aware of the circumstances. The written report shall describe: what problem has occurred, the remedial measures that have been or will be taken to correct the problem, and the measures taken to prevent the recurrence of damage or inoperation. The Department may require the replacement of inoperable monitoring wells.

d. Prior to installation of new or replacement monitoring wells, the placement or design must be approved in writing by the Department. Well logs and a well completion report shall be submitted to the Department within 30 days of installation of the well. The report shall include a survey drawing showing the location of all monitoring wells, disposal sites, and water bodies.

e. Prior to abandonment of existing wells deemed unsuitable for groundwater monitoring, an abandonment plan must be submitted to the Department for review and approval.

6. The Department may reopen the permit, if necessary, to include new or revised monitoring and reporting requirements, compliance conditions and schedules, and special conditions.

SCHEDULE F

General Conditions

SECTION A. STANDARD CONDITIONS

1. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws, or regulations.

2. Liability

The Department of Environmental Quality, its officers, agents, or employees shall not sustain any liability on account of the issuance of this permit or on account of the construction or maintenance of facilities because of this permit.

3. Permit Actions

After notice by the Department, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including but not limited to the following:

a. Violation of any term or condition of this permit, any applicable rule or statute, or any order of the Commission;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts.

4. Transfer of Permit

This permit shall not be transferred to a third party without prior written approval from the Department. Such approval may be granted by the Department where the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of this permit and the rules of the Commission. A transfer application and filing fee must be submitted to the Department.

5. Permit Fees

The permittee shall pay the fees required to be filed with this permit application and to be paid annually for permit compliance determination as outlined in the Oregon Administrative Rules.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times maintain in good working order and properly operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

2. Standard Operation and Maintenance

All waste collection, control, treatment, and disposal facilities shall be operated in a manner consistent with the following:

a. At all times, all facilities shall be operated as efficiently as possible and in a manner which will prevent discharges, health hazards, and nuisance conditions.

b. All screenings, grit, and sludge shall be disposed of in a manner approved by the Department such as to prevent any pollutant from such materials from reaching any waters of the state, creating a public health hazard, or causing a nuisance condition.

c. Bypassing of untreated waste is generally prohibited. No bypassing shall occur without prior written permission from the Department except where unavoidable to prevent loss of life, personal injury, or severe property damage.

3. Noncompliance and Notification Procedures

In the event the permittee is unable to comply with all the conditions of this permit because of surfacing sewage, a breakdown of equipment or facilities, an accident caused by human error or negligence, or any other cause such as an act of nature, the permittee shall:

a. Immediately take action to stop, contain, and clean up the unauthorized discharges and correct the problem.

b. Immediately notify the Department's Regional office, so that an investigation can be made to evaluate the impact and the corrective actions taken and determine additional action that must be taken.

c. Within 5 days of the time the permittee becomes aware of the circumstances, the permittee shall submit to the Department a detailed written report describing the breakdown, the actual quantity and quality of resulting waste discharges, corrective action taken, steps taken to prevent a recurrence, and any other pertinent information.

Compliance with these requirements does not relieve the permittee from responsibility to maintain continuous compliance with the conditions of this permit or the resulting liability for failure to comply.

4. Wastewater System Personnel

The permittee shall provide an adequate operating staff which is duly qualified to carry out the operation, maintenance, and monitoring requirements to assure continuous compliance with the conditions of this permit.

SECTION C. MONITORING AND RECORDS

1. Inspection and Entry

The permittee shall, at all reasonable times, allow authorized representatives of the Department of Environmental Quality to:

a. Enter upon the permittee's premises where a waste source or disposal system is located or where any records are required to be kept under the terms and conditions of this permit;

b. Have access to and copy any records required to be kept under the terms and conditions of this permit;

c. Inspect any treatment or disposal system, practices, operations, monitoring equipment, or monitoring method regulated or required by this permit; or

d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

2. Averaging of Measurements

Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean, except for bacteria which shall be averaged as specified in the permit.

3. Monitoring Procedures

Monitoring must be conducted according to test procedures specified in the most recent edition of **Standard Methods for the Examination of Water and Wastewater**, unless other test procedures have been approved in writing by the Department and specified in this permit.

4. Retention of Records

The permittee shall retain records of all monitoring and maintenance information, including all calibrations, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. The Director may extend this period at any time.

SECTION D. REPORTING REQUIREMENTS

1. Plan Submittal

Pursuant to Oregon Revised Statute 468B.055, unless specifically exempted by rule, no construction, installation or modification of disposal systems, treatment works, or sewerage systems shall be commenced until plans and specifications are submitted to and approved in writing by the Department. All construction, installation or modification shall be in strict conformance with the Department's written approval of the plans.

2. Change in Discharge

Whenever a facility expansion, production increase, or process modification is anticipated which will result in a change in the character of pollutants to be discharged or which will result in a new or increased discharge that will exceed the conditions of this permit, a new application must be submitted together with the necessary reports, plans, and specifications for the proposed changes. No change shall be made until plans have been approved and a new permit or permit modification has been issued.

3. Signatory Requirements

All applications, reports or information submitted to the Department shall be signed and certified by the official applicant of record (owner) or authorized designee.

SECTION E. DEFINITIONS

1. BOD_5 means five-day biochemical oxygen demand.
2. TSS means total suspended solids.
3. FC means fecal coliform bacteria.
4. NH_3-N means Ammonia Nitrogen.
5. NO_3-N means Nitrate Nitrogen.
6. NO_2-N means Nitrite Nitrogen.
7. TKN means Total Kjeldahl Nitrogen.
8. Cl means Chloride.
9. TN means Total Nitrogen.
10. mg/L means milligrams per liter.
11. ug/L means micrograms per liter.
12. kg means kilograms.
13. GPD means gallons per day.
14. MGD means million gallons per day.
15. The term "bacteria" includes but is not limited to fecal coliform bacteria, total coliform bacteria, and E. coli bacteria.
16. Total residual chlorine means combined chlorine forms plus free residual chlorine.
17. Grab sample means an individual discrete sample collected over a period of time not to exceed 15 minutes.
18. Composite sample means a combination of samples collected, generally at equal intervals over a 24-hour period, and apportioned according to the volume of flow at the time of sampling.
19. Week means a calendar week of Sunday through Saturday.
20. Month means a calendar month.
21. Quarter means January through March; April through June, July through September, or October through December.

APPENDIX B
Cursory Environmental Assessment

MEMO

To:	Nick Green, City Manager, City of John Day
From:	Dana Kurtz, Environmental Scientist, and Kim Young, NEPA Specialist
Subject:	**City of John Day, Oregon - Wastewater Facilities Plan - Cursory Environmental Assessment**
Date:	August 22, 2018
Job/File No.	592-25-02 (w/encl.)
cc:	Mike Lees, E.I., Anderson Perry & Associates, Inc.

Project Description

The City of John Day (City) is located approximately 1 mile north of Canyon City in Grant County at the intersection of U.S. Highways 26 and 395. The City's wastewater treatment system was first constructed in 1949, with major additions completed in 1970 and 1978. The wastewater treatment system includes a wastewater treatment facility (WWTF) and a wastewater collection system. The WWTF serves both John Day and Canyon City. The City is proposing to construct a new WWTF, including the addition of a "purple pipe" network and an aquifer storage and recovery (ASR) well for treated wastewater disposal and reuse. There would be no improvements made to the existing collection system.

Wastewater Treatment Facility

The existing WWTF generally consists of a wetwell, headworks, two primary clarifiers, two trickling filters, a secondary clarifier, a primary and secondary anaerobic digester, four sludge drying beds, a chlorine contact basin, and four percolation ponds.

The City's existing WWTF has many components that have surpassed their service life and need to be replaced. As outlined in the Draft 2018 Wastewater Facility Plan (WWFP), prepared by Anderson Perry & Associates, Inc., the City proposes the following:

- The construction of a new WWTF at a new location.
    - The existing WWTF would be demolished. The existing percolation ponds would remain in service until an alternate discharge method is established and permitted by the Oregon Department of Environmental Quality (DEQ).
    - The new WWTF would utilize an ASR well for treated wastewater disposal and reuse. This would allow the City to dispose of wastewater via deep well injection during the winter months and reclaim treated wastewater in the summer months when reuse demands are high.

- The construction of a purple pipe network for use as the City's primary method of effluent disposal when a reuse demands exist.

    - Until the ASR well is permitted, the City would dispose of effluent in the percolation ponds when effluent flows exceed reuse demands during the winter months.

Collection System

The collection system is composed of approximately 84,145 lineal feet (LF) of gravity sewer pipe ranging from 4 to 18 inches in diameter, approximately 10,528 LF of pressure sewer pipe ranging from 4 to 8 inches in diameter, three lift stations, manholes, and cleanouts.

The location of the improvements is shown on the figures attached to the WWFP.

Cursory Environmental Assessment

This is a cursory environmental assessment desktop-level evaluation of features in the vicinity of the project area. Within this evaluation, the project area is divided into the following two locations:

Wastewater Treatment Facility

Includes area for the existing and proposed WWTFs. The existing WWTF is located on the northwestern end of John Day at the end of 7th Avenue and would be demolished. The proposed WWTF would be located approximately 0.5 mile west of the existing WWTF and approximately 0.2 mile west of the percolation ponds. The maximum ground disturbance depths for construction of the new WWTF would be 15 feet for the headworks area; typical excavation is anticipated to be 5 feet. The ASR well at this site would be approximately 8 inches in diameter and would reach a depth of 600 feet.

Purple Pipe Network

Pipeline would run west to east along U.S. Highway 26 beginning at Lower Yard Road County Road 82 for approximately 1.5 miles. The pipeline would then turn north to follow an unnamed dirt road across the John Day River. Once on the north bank of the river, the pipeline would turn and continue east, following the river east until it connects with NW 7th Avenue. The pipeline would then follow NW 7th Avenue to where it ends between NW Bridge Street and Well Road. The maximum ground disturbance depth for the installation of this pipeline is anticipated to be 4 feet.

This review is preliminary and is based on an evaluation of existing data. The following environmental conditions and concerns exist or are associated with the project area.

Waterways and Wetlands

Waterways

The WWTF and purple pipe network are adjacent to the John Day River. No discharge to Waters of the State is permitted with the City's current Water Pollution Control Facilities Permit; instead, the City disposes of discharge through percolation ponds. Groundwater is shallow near the John Day River and river contamination under the existing system is possible. In the future, it is likely DEQ may require changes to the City's disposal method. If this were to happen, the proposed new disposal method would be the ASR well, which would likely result in improved groundwater quality as well as implementation of surface water discharge limitations.

Wetlands

According to the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory Map, no wetlands are mapped within the project area (USFWS, 2018) (see Attachment 1). The proposed WWTF would be constructed on ground that is adjacent to the John Day River and would be bounded on the east by a riverine (R5UBFx). The purple pipe network would be laid following U.S. Highway 26 until it crosses the John Day River and continues along the north bank of the river until its termination. The pipeline is anticipated to remain within existing city rights-of-way (ROW) and would be suspended from a bridge at water crossings.

Based on the proposed layout of the project, impacts to wetlands are possible and mitigation and/or avoidance measures may be necessary. A wetland determination may be required to verify wetlands are not present in the project area.

Floodplain

According to the Federal Emergency Management Agency (FEMA), the proposed WWTF falls within a Zone A, meaning this area is within the 100-year floodplain and must be designed to meet 100-year floodplain requirements. Sections of the proposed purple pipe network also fall within the 100-year and 500-year floodplain requirements and would need to be designed accordingly (FEMA, 2018) (see Attachment 2). This would likely require a local floodplain development permit.

Federally Listed Species and Critical Habitat

According to the USFWS and National Marine Fisheries Service (NMFS) lists of protected species (iPac, 2018) (NMFS, 2018), the John Day River is considered critical habitat for steelhead, Chinook salmon, and bull trout (Oregon Department of State Lands [DSL], 2017) (StreamNet, 2018) (see Attachment 3). Aquatic species may be affected if there is any in-water work.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) of 1918 is a federal law implemented to protect migratory birds. The MBTA makes it unlawful to pursue, hunt, take, capture, kill, or sell listed migratory birds without a waiver. Migratory birds may seek refuge on the ground, in trees, or on cliffs and structures such as buildings and bridges. The MBTA prohibits the removal of all listed species and their parts (feathers, eggs, nests, etc.) from such property.

The Bald and Golden Eagle Protection Act, as amended, is a similar law that prohibits anyone without a permit from molesting, disturbing, or possessing parts, nests, or eggs of bald and golden eagles. Once the specific corridor alignment is developed, if eagles or their nests are located within the alignment, the applicable current regulations regarding activity restrictions near eagle nesting and roosting sites should be followed during construction.

Cultural Resources and Historic Properties

The Oregon Archaeological Records Remote Access (OARRA) Database lists one cultural resource survey and no previously recorded archaeological sites within the proposed footprint of the improvements (OARRA, 2018) (Oregon Historic Sites Database, 2018). This survey was conducted in 2005 by the Oregon Department of Transportation for proposed alterations to portions of U.S. Highway 26. According to the OARRA Database, ten cultural resource surveys have resulted in the recording of two historic sites within a 1-mile radius of the project area. Surveys have generally been conducted for communication tower installation, infrastructure improvements, and reconnaissance for community expansion projects. One site within the 1-mile radius is a historic agricultural property based on historic Oregon State Historic Preservation Office (SHPO) maps. The other site is the Kam Wah Chung archaeological site, associated with the historic building now owned by the Oregon Parks and Recreation Department. Relatively few cultural resource surveys have been conducted in and around John Day, and it is likely many archaeological sites in the area have not yet been documented. Both pre-contact and historic cultural resources may be impacted due to the project location, especially along the John Day River and near its confluence with Canyon Creek.

Potential impacts to archaeological resources as a result of construction include excavation, sediment disturbance, sediment compaction, and other ground-disturbing construction activities. Additional examination of historic maps should occur as specific plans and designs are made to ascertain if such work could potentially impact historical archaeological deposits and mitigate for such impacts. Additionally, efforts may be required to identify previous areas of disturbance within proposed work areas, so undisturbed areas may be avoided or investigated for archaeological materials. The project occurs within an area that is generally assumed to have a high potential for pre-contact and historic cultural resources. SHPO and Native American Tribes with an interest in the area should be consulted prior to finalizing the project design.

Additional requirements may be necessary depending on federal involvement (funding or permits), which may necessitate compliance with Section 106 of the National Historic Preservation Act (NHPA). If no federal nexus is identified, the project must still comply with Oregon Revised Statutes (ORS) (ORS 97.740, ORS 358.905-358.961, ORS 390.235) and Oregon Administrative Rule 736-051-0090, which

protect Native American cairns, graves, and associated items; items of cultural patrimony; and archaeological sites on non-federal and private lands. Additional archaeological surveying, testing, and/or permitting may be required to comply with state laws.

Parks and Natural Areas

There are no parks within the vicinity of the new WWTF. There is one public park, the 7th Street Complex, that would be affected by the installation of the purple pipe network. The 7th Street Complex is located at the northwest boundary of the purple pipe network. It includes meeting areas, tennis and basketball courts, and several baseball fields. While the services of the park would not be affected, it is possible that access and parking may be temporarily obstructed. Upon completion of the project, however, it is presumed that the park would utilize the recycled effluent for irrigation purposes.

Land Use

The new WWTF would be built on City-owned property in an area zoned for General Industrial (GI) use. The existing WWTF is zoned for GI use; when it is demolished, the land would be incorporated for use in the City's rural "Innovation Gateway" project. No overall land use changes related to the WWTF are anticipated.

The purple pipe network would be constructed on property that includes a mixture of residential, commercial, and industrial uses. The network would be installed on existing ROWs adjacent to existing roads and gravel shoulders. City and County permits are anticipated to be required to complete work within these ROWs. No zoning changes are anticipated.

Improvements to lift stations are not anticipated to have any direct or indirect impacts to land use at this time.

Important Farmland

No soil data was available from the Natural Resources Conservation Service (NRCS) for the City or the vicinity immediately surrounding (NRCS, 2018). A report published by the Oregon Agricultural Experiment Station and U.S. Department of Agriculture (1981) indicates the area soils consist primarily of well-drained silt loams that are classified from fair to very poor for growing grain and seed crops.

Because there is no designated prime farmland, there is no farmland that would undergo a conversion. No additional consultation with NRCS (such as an AD-1006 Form) is anticipated.

Hazardous Materials

Environmental records were reviewed for identified hazardous and solid waste sites, cleanup sites, underground storage tanks (UST), and leaking underground storage tanks using information on the DEQ Environmental Cleanup Site Information Database and DEQ Facility Profiler (DEQ, 2018). For a map of facilities, see Attachment 4.

No environmental records were found within the footprint of the new WWTF.

Two sites were identified in the project area. There was one site directly on the pathway of the purple pipe network and one more in proximity. The site along the pathway is a Jackson Oil Cardlock station on the north side of U.S. Highway 26, west of Patterson Bridge Road. It contains multiple USTs filled with vehicle fuel and holds a permit for air emissions of volatile organic compounds. This site has no reported violations. The second site is also on the north side of U.S. Highway 26, at the corner of Apple Road and Wilderness Road. This site is a former bulk oil plant. Investigation of the site and soil sampling was completed in 2007, and no formal violations or cleanup activities were required. Neither of these sites is likely to impact the proposed project.

Permits

The National Environmental Policy Act (NEPA) states that if there is a federal action (i.e., funding, permitting, etc.), the project must comply with NEPA requirements.

If work is performed below the ordinary high water elevation or within wetlands, permits may be required from the U.S. Army Corps of Engineers (USACE) and the DSL. If a USACE permit is required, it would trigger a federal nexus requiring compliance with Section 7 of the Endangered Species Act (ESA), as well as Section 106 of the NHPA. Compliance with Section 7 would require an analysis of the potential impact on ESA-listed species and consultation with USFWS and NMFS.

Depending on the area of disturbance, a 1200-C Stormwater Construction Permit may be required.

Conclusion

The City's proposed wastewater system project has been inferred, through database research, to have potential impacts to resources and may require the following environmental compliance measures:

Waterways and Wetlands

- A wetland delineation may be required due to the close proximity of the work to the John Day River. No work within a waterway or wetland is anticipated. However, a site visit is recommended to document the occurrence of wetlands, and a wetland delineation may be required if wetlands would be impacted by the project.

- Impacts to wetlands may require compensatory mitigation.

- The new WWTF and portions of the purple pipe network would be constructed in the 100-year floodplain. If development occurs in the 100-year floodplain, FEMA standards may need to be considered and a local floodplain development permit may need to be obtained.

Federally Listed Species and Critical Habitat

- Consultation with the USFWS and NMFS may be required if there is a federal nexus (federal permits, federal funding, and/or federal land). As designed, it appears that the project may require an environmental assessment pursuant to federal funding requirements.

Migratory Birds

- Current regulations regarding activity restrictions near eagle nesting and roosting sites should be followed during construction. It is unlikely the project would affect migratory birds.

Cultural Resources and Historic Properties

- Known cultural resource sites should be avoided so as not to disturb sensitive cultural resources.
- If a federal nexus is anticipated, Section 106 of the NHPA requirements may apply.
- The SHPO officer and local tribal historic preservation officers should be consulted to identify any potential concerns or important resources.
- A cultural resource survey may be required for any ground disturbance at the new WWTF site or for any part of the lift station improvements that occur on land that has not been previously surveyed or disturbed.
- Recommendations provided by SHPO and the Tribes should be followed.
- If cultural resources are discovered during construction, all work should halt, and SHPO should be notified.

Parks and Natural Areas

- The project is not anticipated to permanently affect parks and natural areas.

Land Use

- A Conditional Use Permit is anticipated to be required for the new WWTF.

Hazardous Materials

- Depending on funding requirements, additional assessment of hazardous materials may be required.

Stormwater

- A 1200-C Stormwater Construction Permit may be required if disturbance is greater than 1 acre.
- If the project increases impervious surfaces, a Stormwater Management Plan may be required.

Best management practices should be applied to all construction activities.

References

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Enclosures

Attachments
Attachment 1 - U.S. Fish and Wildlife Service National Wetlands Inventory Map
Attachment 2 - Federal Emergency Management Agency Floodplain Map
Attachment 3 - U.S. Fish and Wildlife Service Trust List
Attachment 4 - Oregon Department of Environmental Quality Map

KY/ct
G:\Clients\John Day\Wastewater\592-25 WWFP Update\Correspondence\Memo\Memo 082218.doc

ATTACHMENT 1
U.S. Fish and Wildlife Service
National Wetlands Inventory Map

U.S. Fish and Wildlife Service
National Wetlands Inventory

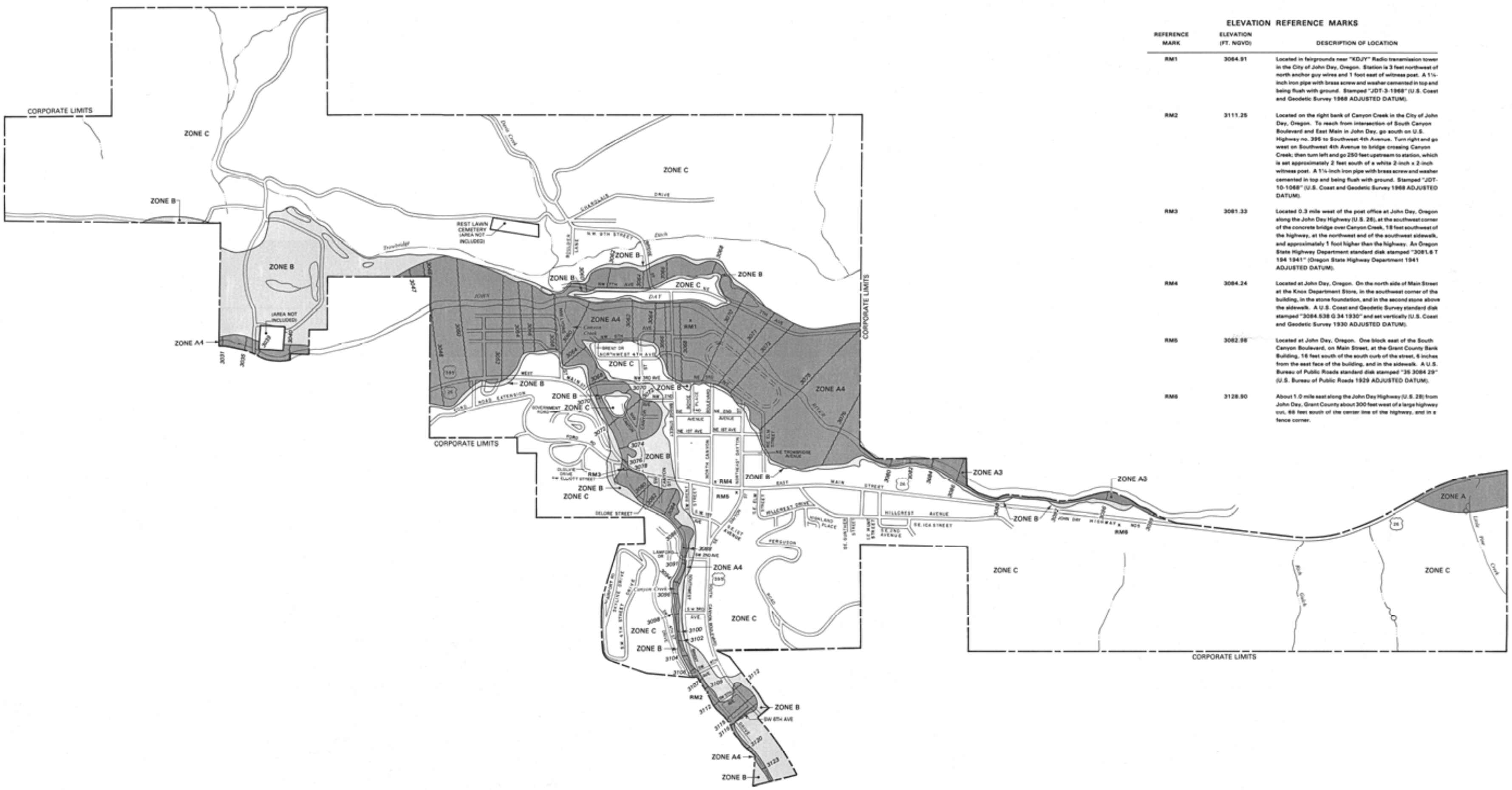
John Day WWTF and Purple Pipe Network

July 31, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ATTACHMENT 2
Federal Emergency Management Agency
Floodplain Map



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM1	3064.91	Located in fairgrounds near "KDJY" Radio transmission tower in the City of John Day, Oregon. Station is 3 feet northwest of north anchor guy wires and 1 foot east of witness post. A 1¼-inch iron pipe with brass screw and washer cemented in top and being flush with ground. Stamped "JDT-3-1968" (U.S. Coast and Geodetic Survey 1968 ADJUSTED DATUM).
RM2	3111.25	Located on the right bank of Canyon Creek in the City of John Day, Oregon. To reach from intersection of South Canyon Boulevard and East Main in John Day, go south on U.S. Highway no. 395 to Southwest 4th Avenue. Turn right and go west on Southwest 4th Avenue to bridge crossing Canyon Creek; then turn left and go 250 feet upstream to station, which is set approximately 2 feet south of a white 2-inch x 2-inch witness post. A 1¼-inch iron pipe with brass screw and washer cemented in top and being flush with ground. Stamped "JDT-10-1068" (U.S. Coast and Geodetic Survey 1968 ADJUSTED DATUM).
RM3	3081.33	Located 0.3 mile west of the post office at John Day, Oregon along the John Day Highway (U.S. 26), at the southwest corner of the concrete bridge over Canyon Creek, 18 feet southwest of the highway, at the northwest end of the southwest sidewalk, and approximately 1 foot higher than the highway. An Oregon State Highway Department standard disk stamped "3081.6 T 194 1941" (Oregon State Highway Department 1941 ADJUSTED DATUM).
RM4	3084.24	Located at John Day, Oregon. On the north side of Main Street at the Knox Department Store, in the southwest corner of the building, in the stone foundation, and in the second stone above the sidewalk. A U.S. Coast and Geodetic Survey standard disk stamped "3084.538 G 34 1930" and set vertically (U.S. Coast and Geodetic Survey 1930 ADJUSTED DATUM).
RM5	3082.98	Located at John Day, Oregon. One block east of the South Canyon Boulevard, on Main Street, at the Grant County Bank Building, 16 feet south of the south curb of the street, 6 inches from the east face of the building, and in the sidewalk. A U.S. Bureau of Public Roads standard disk stamped "35 3084 29" (U.S. Bureau of Public Roads 1929 ADJUSTED DATUM).
RM6	3128.90	About 1.0 mile east along the John Day Highway (U.S. 26) from John Day, Grant County about 300 feet west of a large highway cut, 66 feet south of the center line of the highway, and in a fence corner.

KEY TO MAP

500-Year Flood Boundary	
	ZONE B
100-Year Flood Boundary	
Zone Designations*	ZONE A1 / ZONE A6
100-Year Flood Boundary	
	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7x
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

INITIAL IDENTIFICATION:
MARCH 22, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
DECEMBER 26, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:
SEPTEMBER 15, 1977

FLOOD INSURANCE RATE MAP REVISIONS:
FEBRUARY 23, 1982 to change Corporate Limits, to add new Special Flood Hazard Areas, to add Zone Designations, to add Base Flood Elevations, to add Street Names, and to add Streets.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

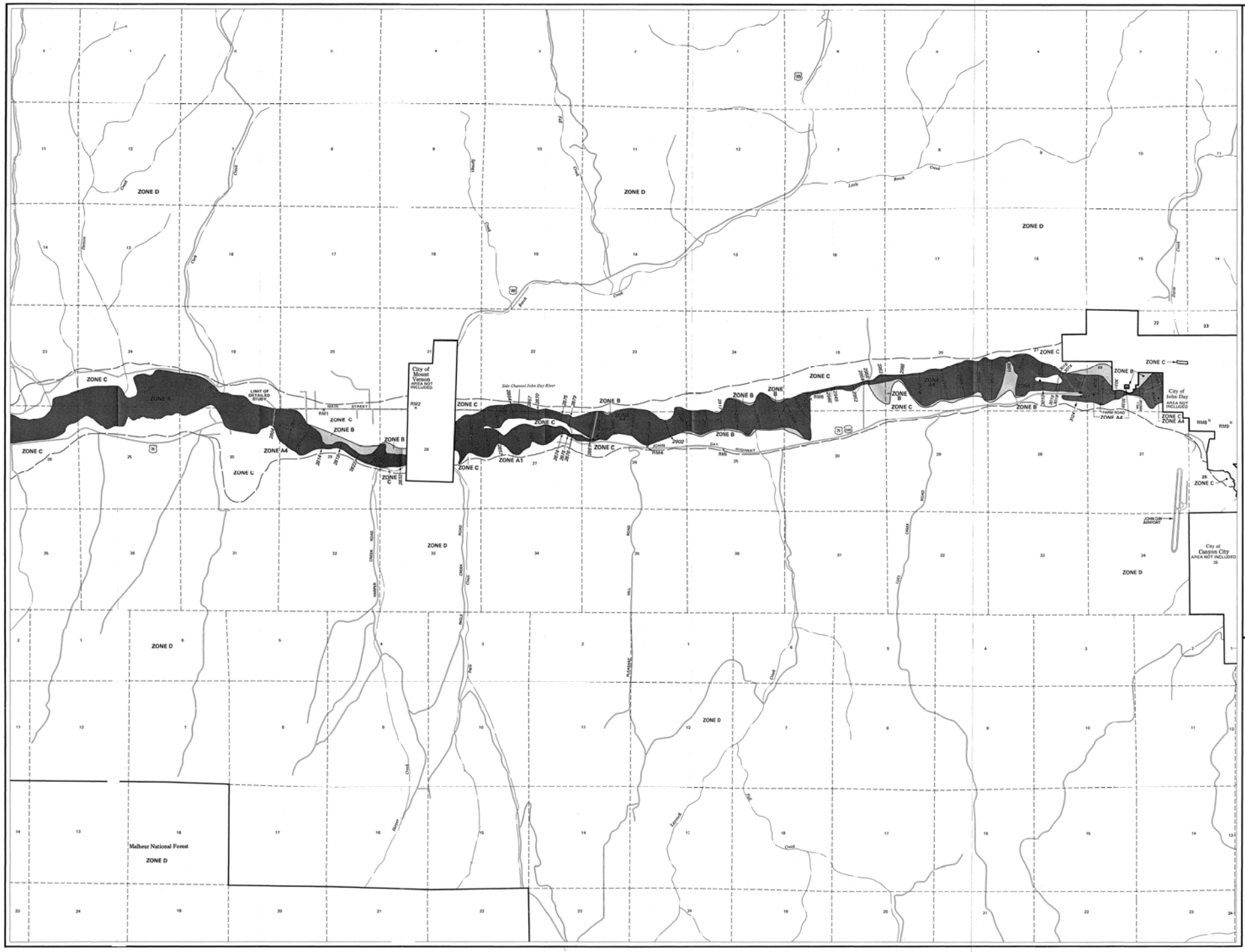
CITY OF
JOHN DAY, OREGON
GRANT COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBER
410077 0001 C

MAP REVISED:
FEBRUARY 23, 1982

federal emergency management agency
federal insurance administration



KEY TO MAP

100 Year Flood Boundary
100 Year Flood Boundary
Zone Designations
100 Year Flood Boundary
100 Year Flood Boundary

ZONE B
ZONE B

Base Flood Elevation Line With Elevation In Feet**
513
Base Flood Elevation in Feet Where Uniform Within Zone**
(EL 987)
Elevation Reference Mark
RM7 ×
River Mile
• M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
AR	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For acquiring map panels, see separately printed Index To Map Panels.

For description of Elevation Reference Marks, see FIRM panel 410074 0825 B.

INITIAL IDENTIFICATION:
OCTOBER 18, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:
FEBRUARY 15, 1979

FLOOD INSURANCE RATE MAP REVISIONS:
MAY 18, 1982 to change Corporate Limits, to reduce Special Flood Hazard Areas, to adjust Base Flood Elevations, to add Street Names, and to add Streets.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

GRANT COUNTY, OREGON
(UNINCORPORATED AREA)

PANEL 675 OF 1200
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
410074 0675 B

MAP REVISED:
MAY 18, 1982

federal emergency management agency

ATTACHMENT 3
U.S. Fish and Wildlife Service Trust List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oregon Fish And Wildlife Office
2600 Southeast 98th Avenue, Suite 100
Portland, OR 97266-1398
Phone: (503) 231-6179 Fax: (503) 231-6195
https://www.fws.gov/oregonfwo/articles.cfm?id=149489416

In Reply Refer To: July 31, 2018
Consultation Code: 01EOFW00-2018-SLI-0558
Event Code: 01EOFW00-2018-E-00959
Project Name: John Day WWSI - WWTF

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 (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) 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: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to investigate opportunities for incorporating conservation of threatened and endangered species into project planning processes as a means of complying with the Act. If you have questions regarding your responsibilities under the Act, please contact the Endangered Species Division at the Service's Oregon Fish and Wildlife Office at (503) 231-6179. For information regarding listed marine and anadromous species under the jurisdiction of NOAA Fisheries Service, please see their website (http://www.nwr.noaa.gov/habitat/habitat_conservation_in_the_nw/habitat_conservation_in_the_nw.html).

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

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:

Oregon Fish And Wildlife Office
2600 Southeast 98th Avenue, Suite 100
Portland, OR 97266-1398
(503) 231-6179

Project Summary

Consultation Code: 01EOFW00-2018-SLI-0558

Event Code: 01EOFW00-2018-E-00959

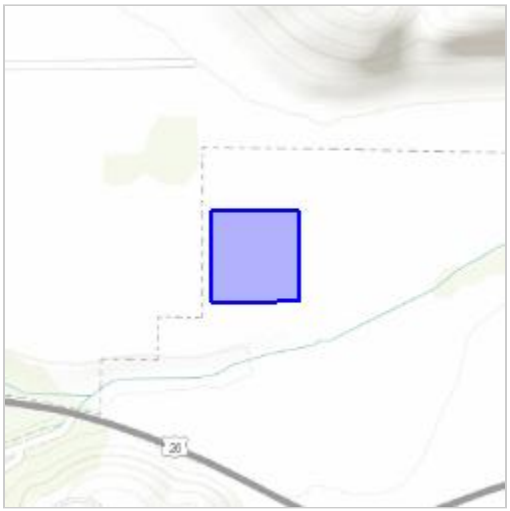
Project Name: John Day WWSI - WWTF

Project Type: WASTEWATER FACILITY

Project Description: WWTF

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.421875301051585N118.97008228358261W



Counties: Grant, OR

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
Gray Wolf *Canis lupus* Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA, MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, and WV; and portions of AZ, NM, OR, UT, and WA. Mexico. There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4488	Endangered

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.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oregon Fish And Wildlife Office
2600 Southeast 98th Avenue, Suite 100
Portland, OR 97266-1398
Phone: (503) 231-6179 Fax: (503) 231-6195
https://www.fws.gov/oregonfwo/articles.cfm?id=149489416

In Reply Refer To:
Consultation Code: 01EOFW00-2018-SLI-0557
Event Code: 01EOFW00-2018-E-00957
Project Name: John Day WWSI - Pipe network

July 31, 2018

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 (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) 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: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to investigate opportunities for incorporating conservation of threatened and endangered species into project planning processes as a means of complying with the Act. If you have questions regarding your responsibilities under the Act, please contact the Endangered Species Division at the Service's Oregon Fish and Wildlife Office at (503) 231-6179. For information regarding listed marine and anadromous species under the jurisdiction of NOAA Fisheries Service, please see their website (http://www.nwr.noaa.gov/habitat/habitat_conservation_in_the_nw/habitat_conservation_in_the_nw.html).

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

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:

Oregon Fish And Wildlife Office
2600 Southeast 98th Avenue, Suite 100
Portland, OR 97266-1398
(503) 231-6179

Project Summary

Consultation Code: 01EOFW00-2018-SLI-0557

Event Code: 01EOFW00-2018-E-00957

Project Name: John Day WWSI - Pipe network

Project Type: WASTEWATER PIPELINE

Project Description: Proposed purple pipe network per 2018 WWFP

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.42110838247069N118.9703337703307W

Counties: Grant, OR

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
Gray Wolf *Canis lupus* Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA, MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, and WV; and portions of AZ, NM, OR, UT, and WA. Mexico. There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4488	Endangered

Fishes

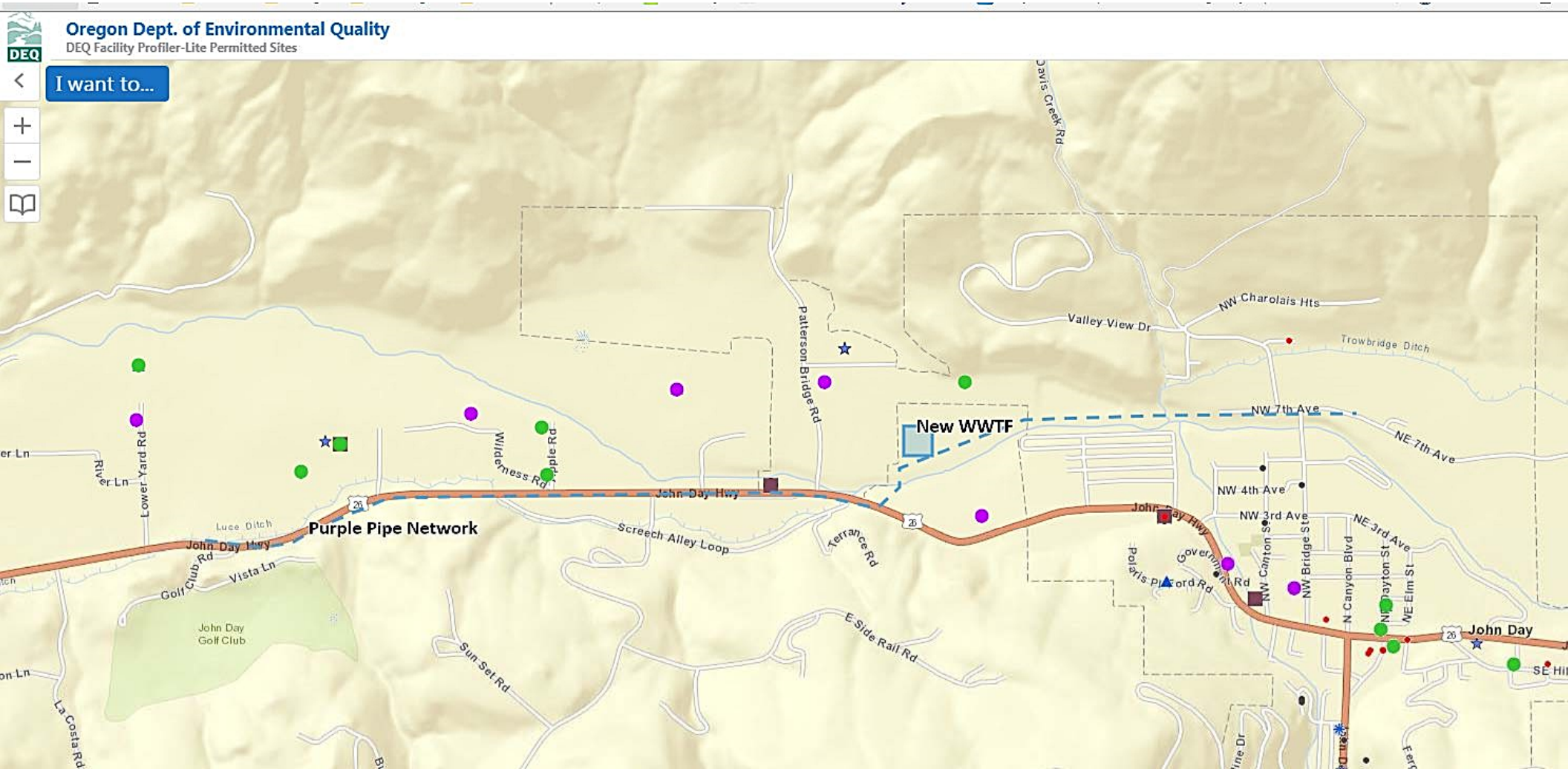
NAME	STATUS
Bull Trout *Salvelinus confluentus* Population: U.S.A., conterminous, lower 48 states There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8212	Threatened

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Bull Trout *Salvelinus confluentus* https://ecos.fws.gov/ecp/species/8212#crithab	Final

ATTACHMENT 4
Oregon Department of Environmental Quality Map


Oregon Dept. of Environmental Quality
DEQ Facility Profiler-Lite Permitted Sites
I want to...
New WWTF
Purple Pipe Network
John Day Golf Club
John Day
Davis Creek Rd
Patterson Bridge Rd
Valley View Dr
NW Charolais Hts
Trowbridge Ditch
NW 7th Ave
NE 7th Ave
NW 4th Ave
NW 3rd Ave
NE 3rd Ave
John Day Hwy
Lower Yard Rd
River Ln
Wilderness Rd
Apple Rd
Luce Ditch
Golf Club Rd
Vista Ln
Screech Alley Loop
Terrance Rd
Sun Set Rd
E Side Rail Rd
La Costa Rd
Polaris Pl
Government Rd
NW Canyon Blvd
NW Bridge St
NW Dayton St
NE Elm St

APPENDIX C
John Day/Canyon City Agreement for Sewerage Services

AMENDMENT NO. 1 TO FIRST AMENDED AND RESTATED INTERGOVERNMENTAL AGREEMENT FOR SEWERAGE SERVICES

This Amendment No. 1 to First Amended and Restated Intergovernmental Agreement for Sewerage Services (this "Amendment") is made and entered into on November 15, 2016, but made effective for all purposes as of July 1, 2016 (the "Effective Date"), between City of John Day, an Oregon municipal corporation ("John Day"), and Town of Canyon City, an Oregon municipal corporation ("Canyon City").

RECITAL:

John Day and Canyon City are parties to a certain First Amended and Restated Intergovernmental Agreement for Sewerage Services (the "Agreement"). The Agreement concerns, among other things, the terms and conditions under which the Sewage Treatment Plant and Sewage Work will be operated, repaired, and maintained (and the sharing of costs and expenses related thereto). John Day and Canyon City desire to enter into this Amendment in order to, among other things, extend the term of the Agreement.

AGREEMENT:

NOW, THEREFORE, in consideration of the mutual promises and covenants contained in this Amendment, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto hereby agree as follows:

1. Extension. The term of the Agreement is extended for one additional term of five years, commencing on July 1, 2016 and ending on June 30, 2021 (the "Extended Term"), unless sooner terminated as provided under the Agreement. The five-year Extended Term will be on the same terms and conditions contained in the Agreement, except as modified in Section 2 of this Amendment.

2. Amendment No. 1. Section 3.1 of the Agreement is amended to read in its entirety as follows:

> "3.1 Monthly Fee. Canyon City will pay a monthly fee to John Day for its proportionate share of the operation, maintenance, and improvement costs associated with the Sewage Treatment Plant as noted in the Joint Sewer Plant Fund. Canyon City's monthly fee is identified in Section 3.1.1, below.
>
> 3.1.1 Payment Schedule. Cost allocation for the operation, maintenance, and improvement of the Sewage Treatment Plant from the Point of Delivery to the Sewage Treatment Plant is based on the following payment schedule:

YEAR	*Monthly Payment (Fee)*	*Annual Total*
CY16	$5,090	$30,540 (6 months)
CY17	$5,351	$64,206
CY18	$5,612	$67,338
CY19	$5,873	$70,470
CY20	$6,134	$73,602
CY21	$6,395	$76,734

3.1.2 Payments. Canyon City will make monthly (fee) payments to John Day in the amounts identified under Section 3.1.1 for the periods identified under Section 3.1.1 on or before the 15th day of each month."

3. Amendment No. 2. Section 3.2 of the Agreement is deleted in its entirety.

4. Amendment No. 3. The term "contract" contained in Section 8.6 of the Agreement is replaced with the term "Agreement."

5. Miscellaneous. This Amendment is hereby expressly made part of the Agreement. The terms and conditions of the Agreement that are not amended or otherwise modified by this Amendment remain unchanged and in full force and effect. All capitalized terms used in this Amendment not otherwise defined herein will have the respective meanings assigned to them in the Agreement. All prior and contemporaneous agreements, discussions, understandings, and negotiations, whether written or oral, express or implied, are merged herein, and to the extent inconsistent herewith, are of no further force and effect. No addition, modification, amendment, or alteration to this Amendment will be effective against the parties unless specifically agreed upon in writing and signed by the parties. This Amendment may be signed in one or more counterparts.

IN WITNESS WHEREOF, the undersigned parties have caused this Amendment to be executed on the date first written above but made effective for all purposes as of the Effective Date.

John Day:
City of John Day,
an Oregon municipal corporation

By: Nick Green
Its: City Manager

Canyon City:
Town of Canyon City,
an Oregon municipal corporation

By: STEVE FISCHER
Its: MAYOR