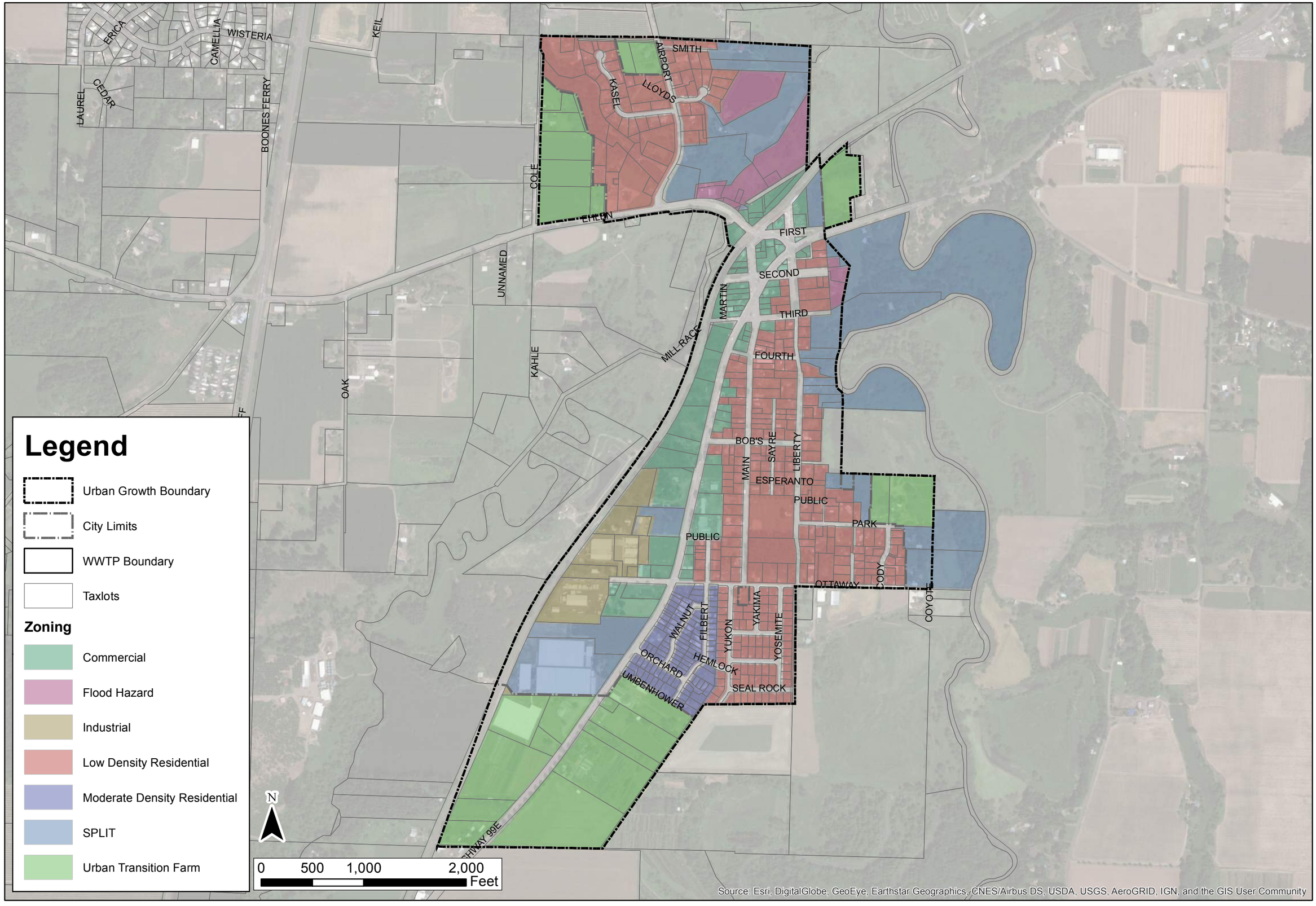
Appendix A
Figures



Legend

- Urban Growth Boundary
- City Limits
- WWTP Boundary
- Taxlots

Zoning

- Commercial
- Flood Hazard
- Industrial
- Low Density Residential
- Moderate Density Residential
- SPLIT
- Urban Transition Farm

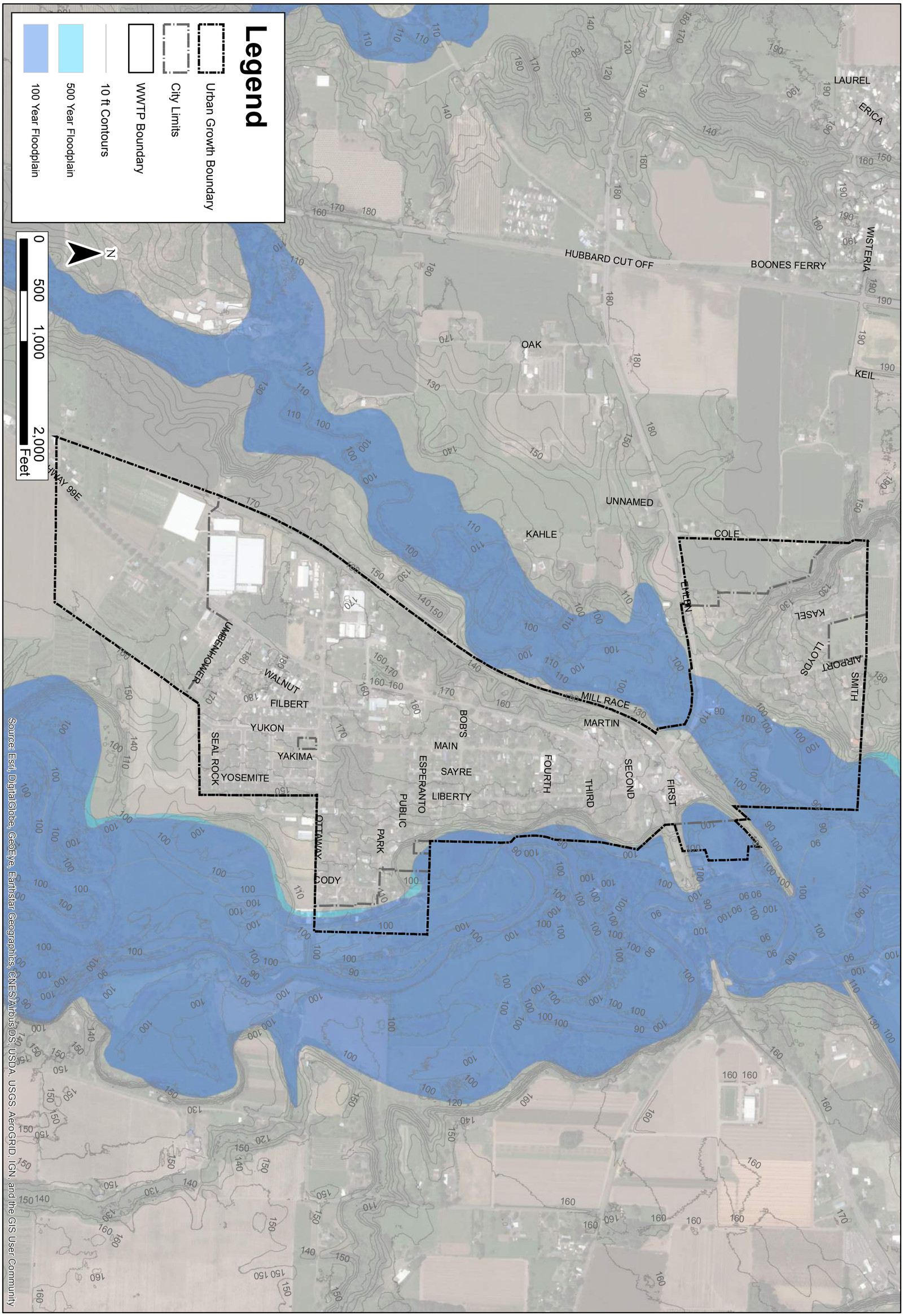
Figure 1

City of Aurora, OR
May 2019

Land Use and Zoning

Wastewater Facilities Planning Study

KELLER ASSOCIATES



KELLER ASSOCIATES

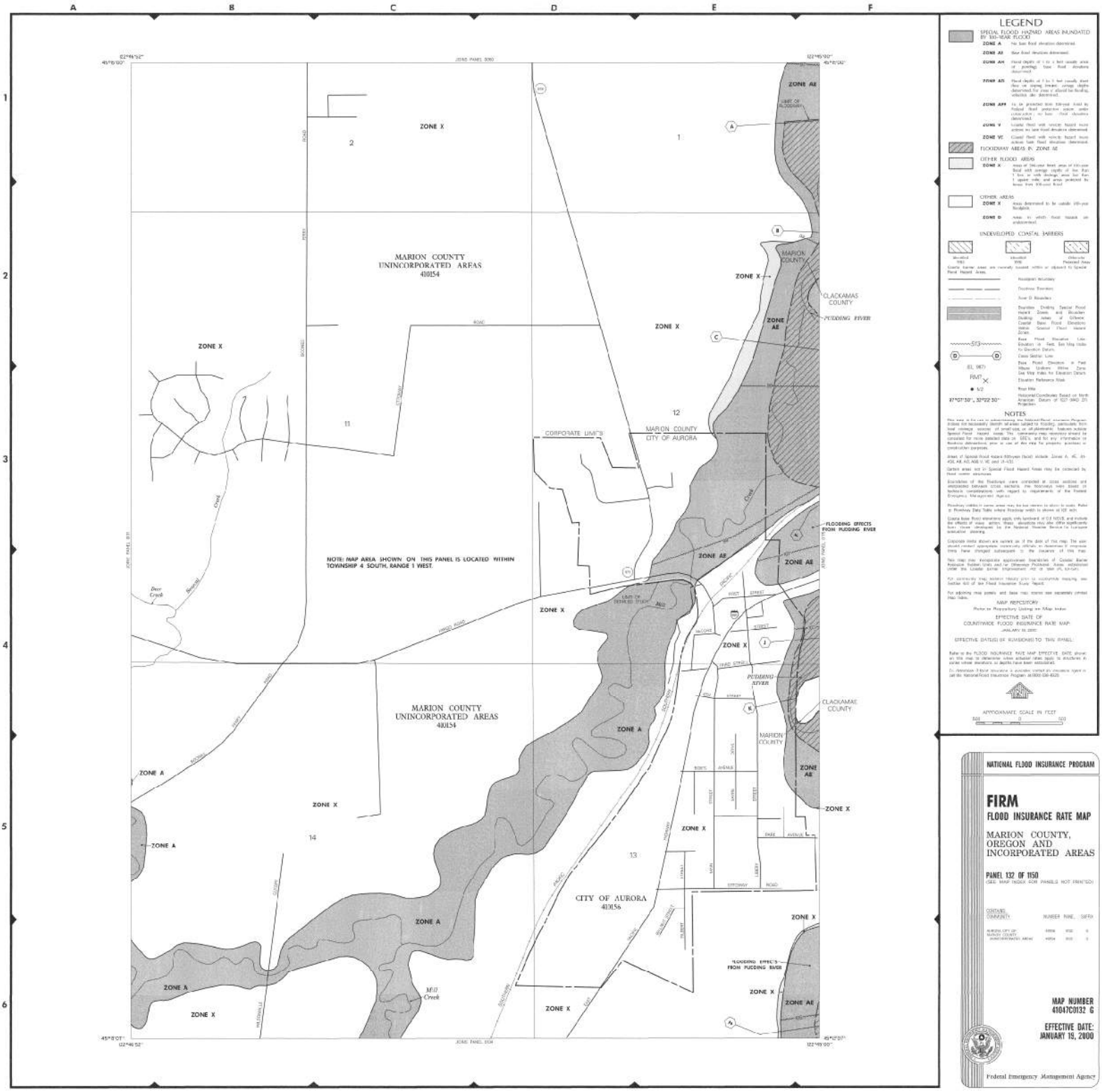
Floodplains and Topography

Wastewater Facilities Planning Study

CITY OF AURORA HISTORIC DISTRICT 1856

Figure 2

City of Aurora, OR
May 2019



Flood Insurance Rate Map

Wastewater Facilities Planning Study

Figure 2.A

City of Aurora, OR
May 2019

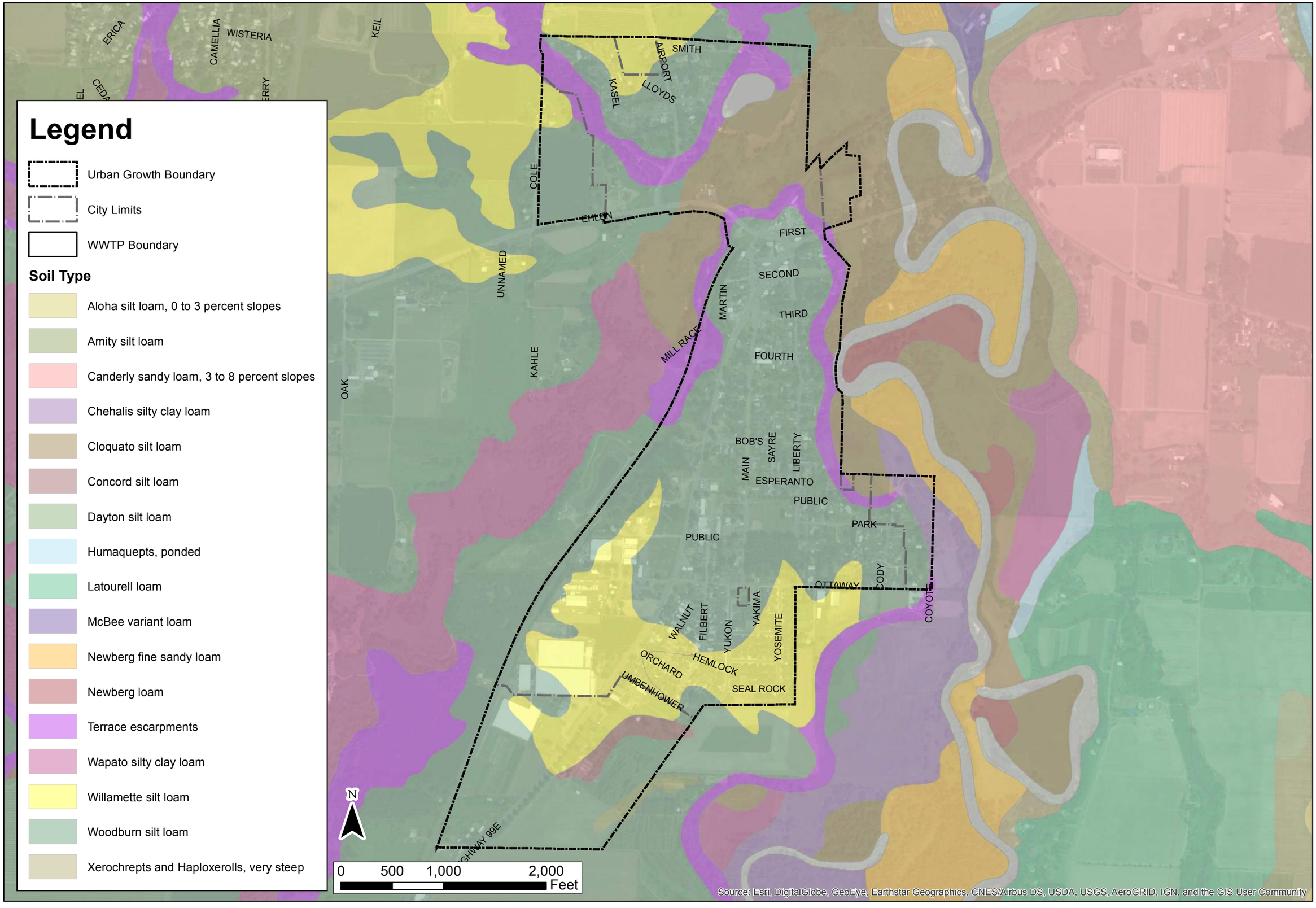


Figure 3

City of Aurora, OR
May 2019

CITY OF AURORA HISTORIC DISTRICT 1856

Soils Classification

Wastewater Facilities Planning Study

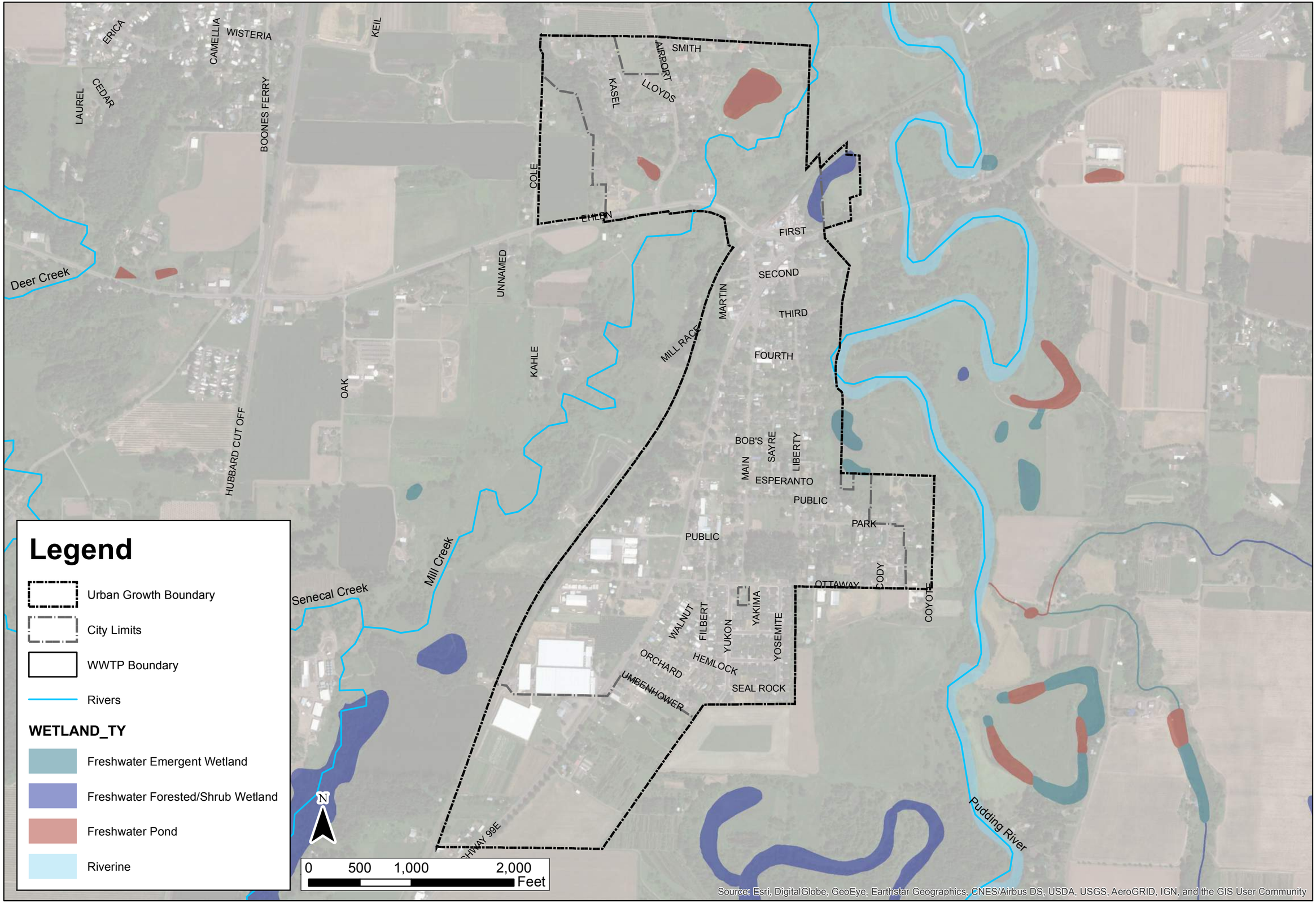
KELLER ASSOCIATES

Figure 4

City of Aurora, OR
May 2019

Wetlands and Rivers

Wastewater Facilities Planning Study



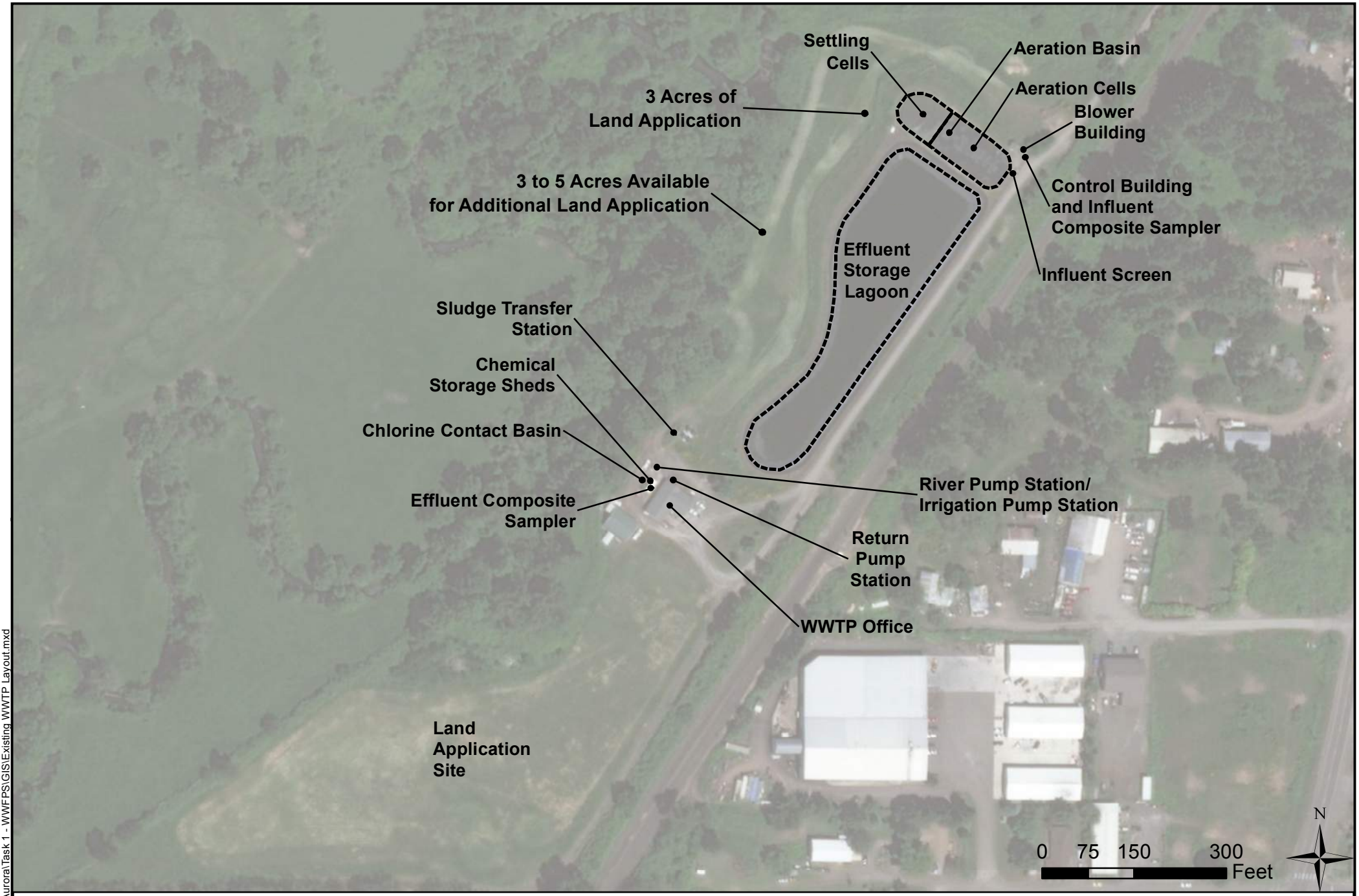
Legend

- Urban Growth Boundary
- City Limits
- WWTP Boundary
- Rivers

WETLAND_TY

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

KELLER ASSOCIATES



Document Path: J:\215120 Aurora\Task 1 - WWFPS\GIS\Existing WWTP Layout.mxd

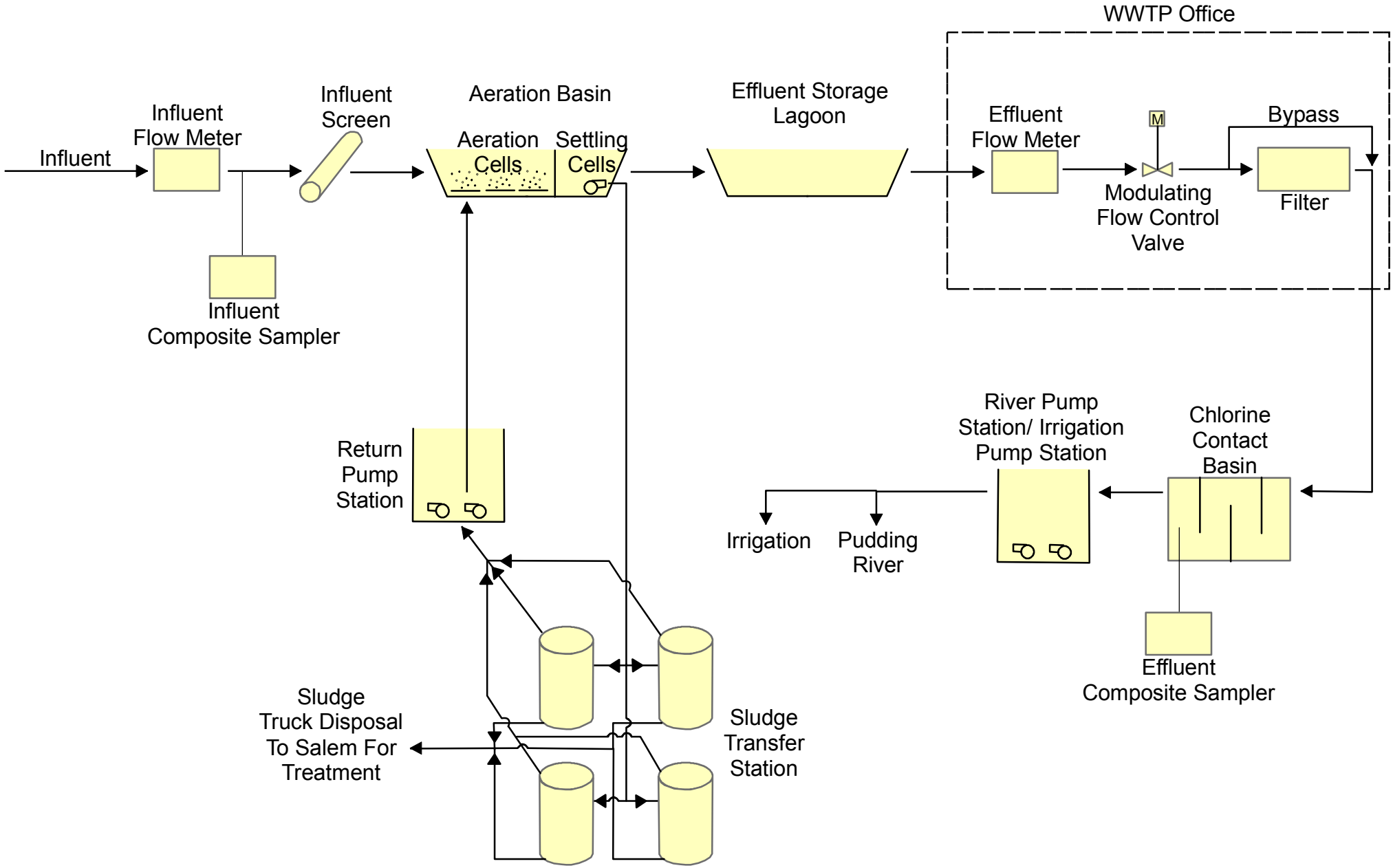
KELLER ASSOCIATES

Existing WWTP Layout

Wastewater Facilities Planning Study

Figure 5

City of Aurora, OR
May 2019



Document Path: J:\215120 Aurora\Task 1 - WWFPS\GIS\Process Flow Diagram.mxd

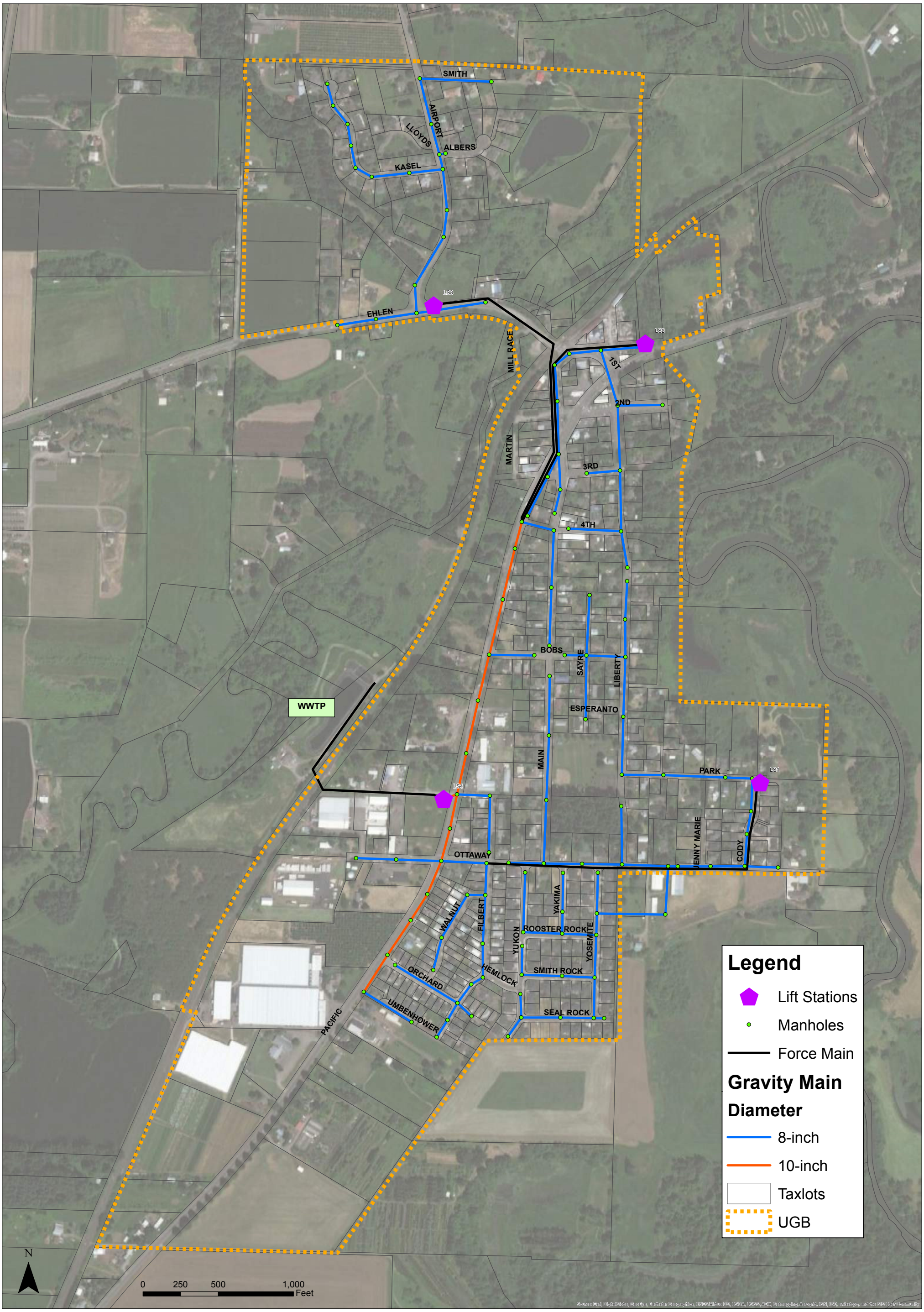
KELLER ASSOCIATES

Process Flow Diagram

Wastewater Facilities Planning Study

Figure 6

City of Aurora, OR
May 2019



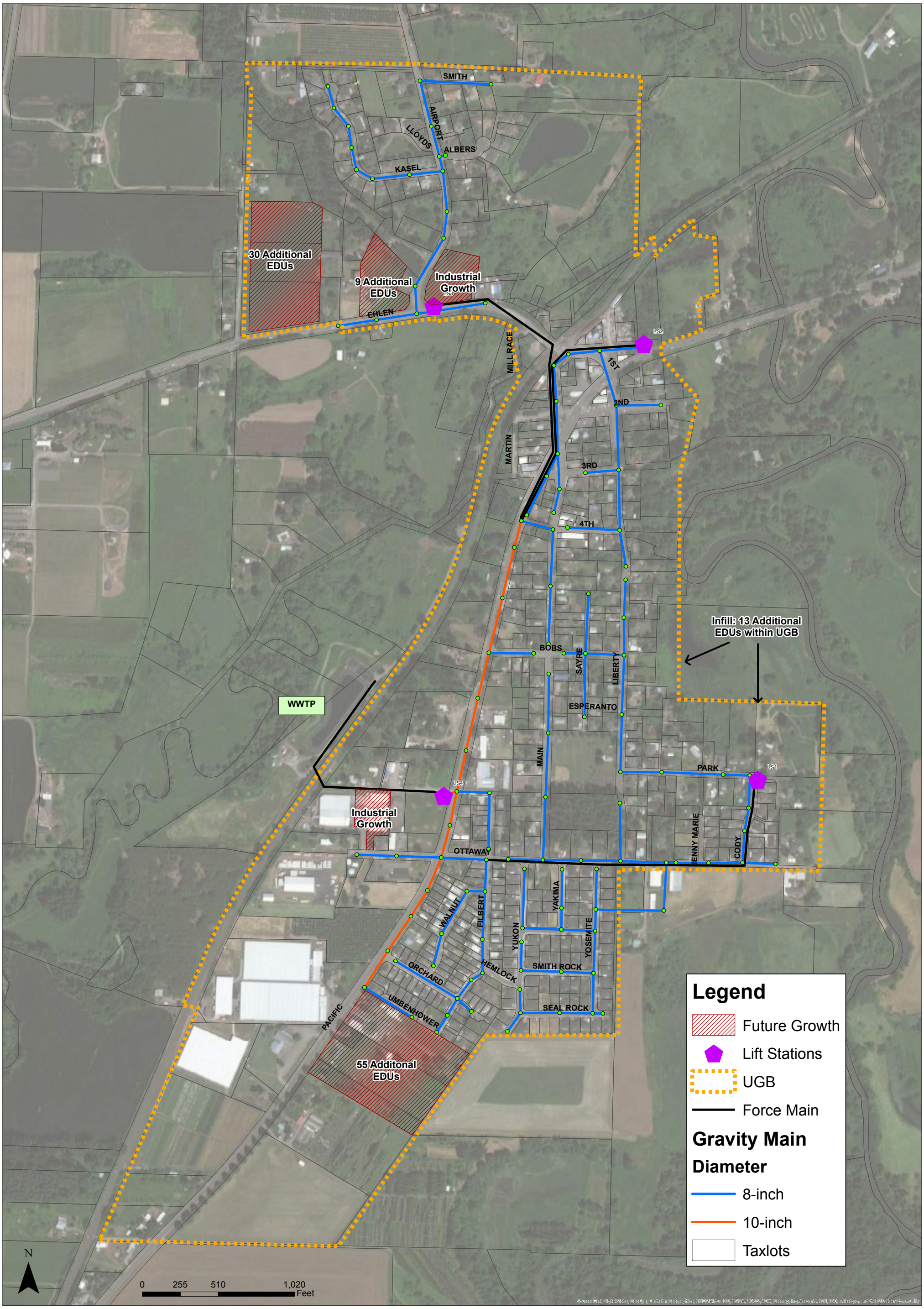
KELLER ASSOCIATES

Existing Wastewater Collection System

Wastewater Facilities Planning Study

Figure 7

City of Aurora, OR
May 2019



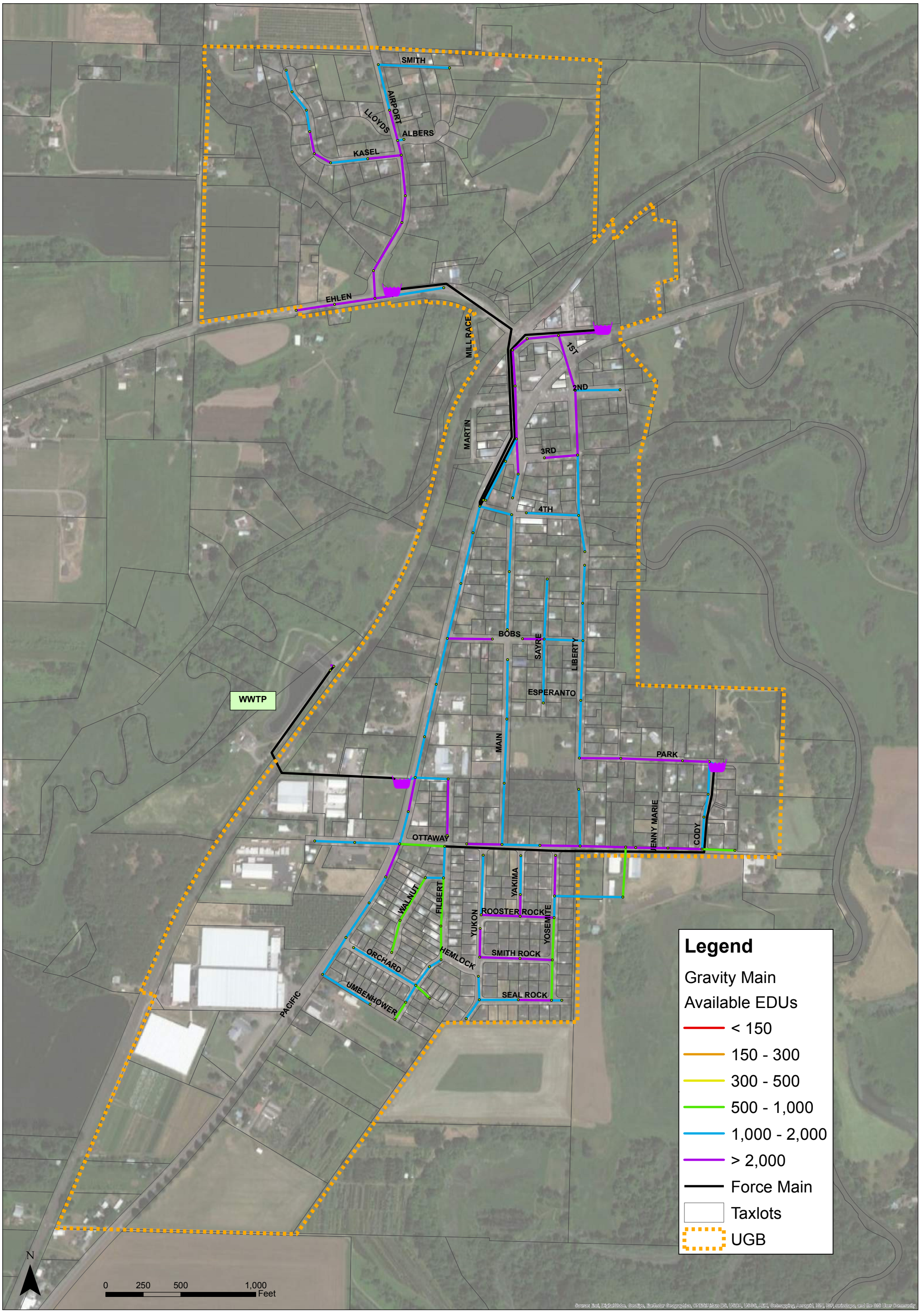
KELLER ASSOCIATES

Areas of Anticipated Future Growth

Wastewater Facilities Planning Study

Figure 8

City of Aurora, OR
May 2019

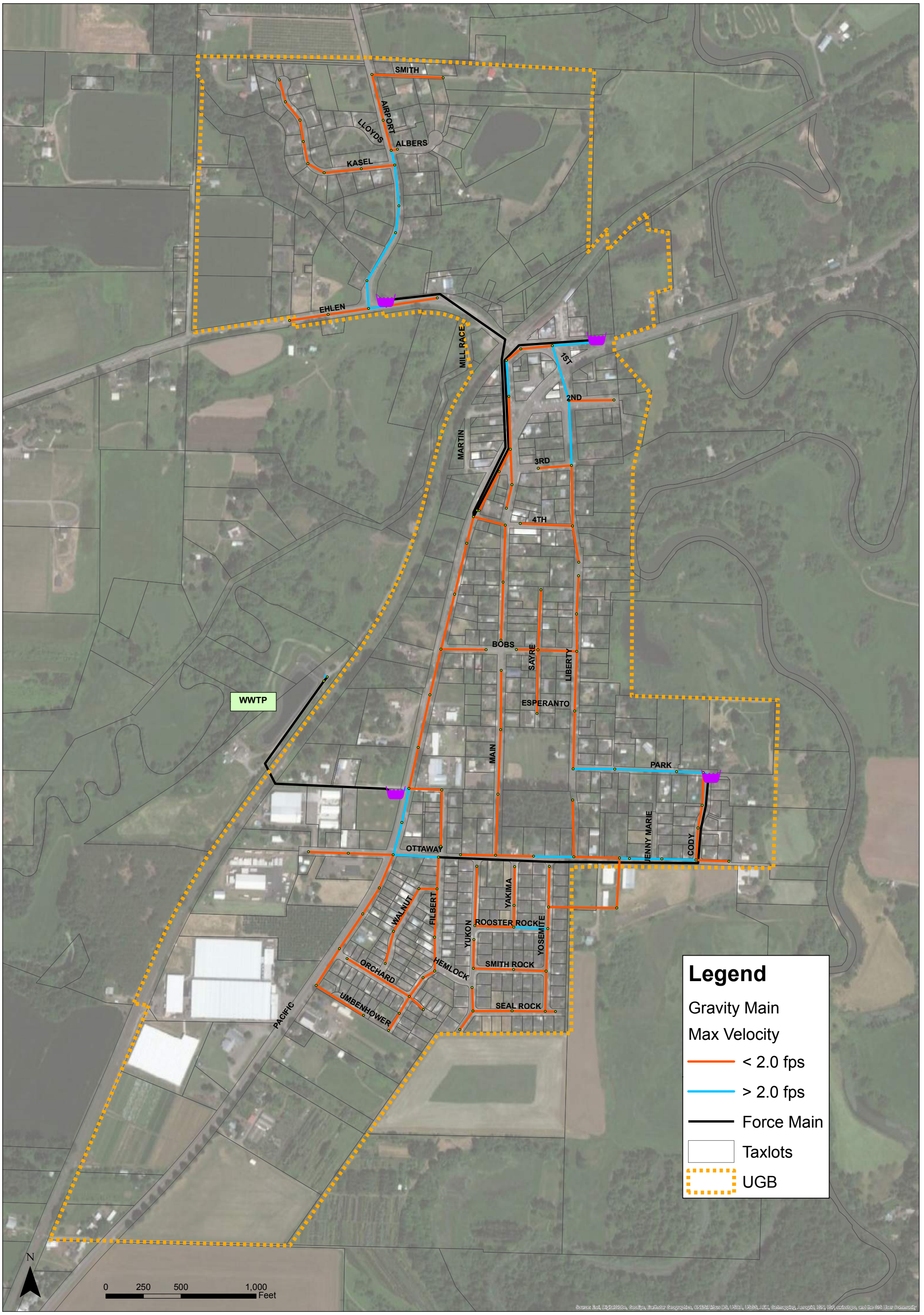


Existing System Evaluation: Available Capacity in Terms of EDUs Added Upstream of Pipe

Wastewater Facilities Planning Study

Figure 9

City of Aurora, OR
May 2019

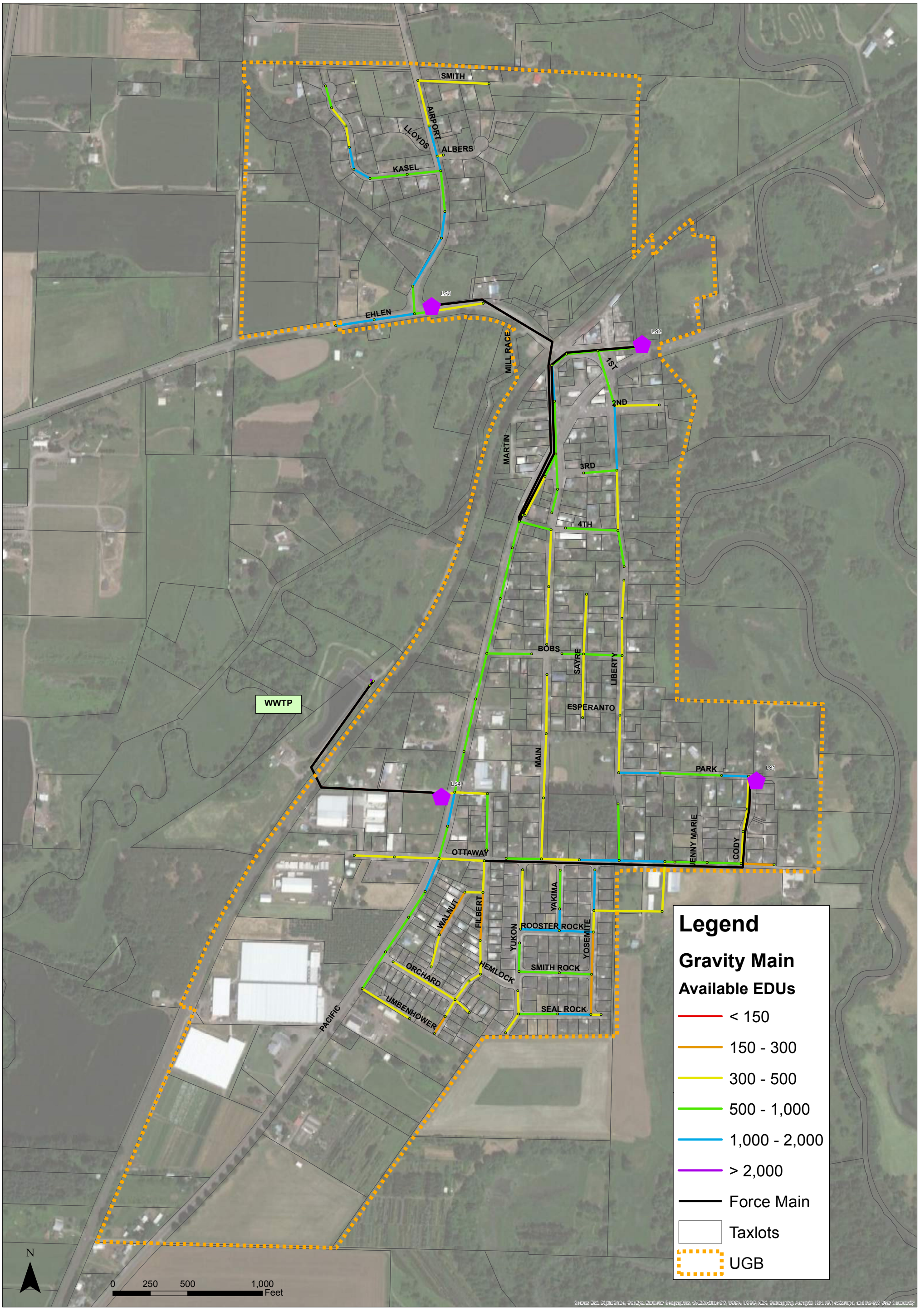


Existing System Evaluation: Maximum Velocity at Peak Instantaneous Flow

Wastewater Facilities Planning Study

Figure 10

City of Aurora, OR
May 2019

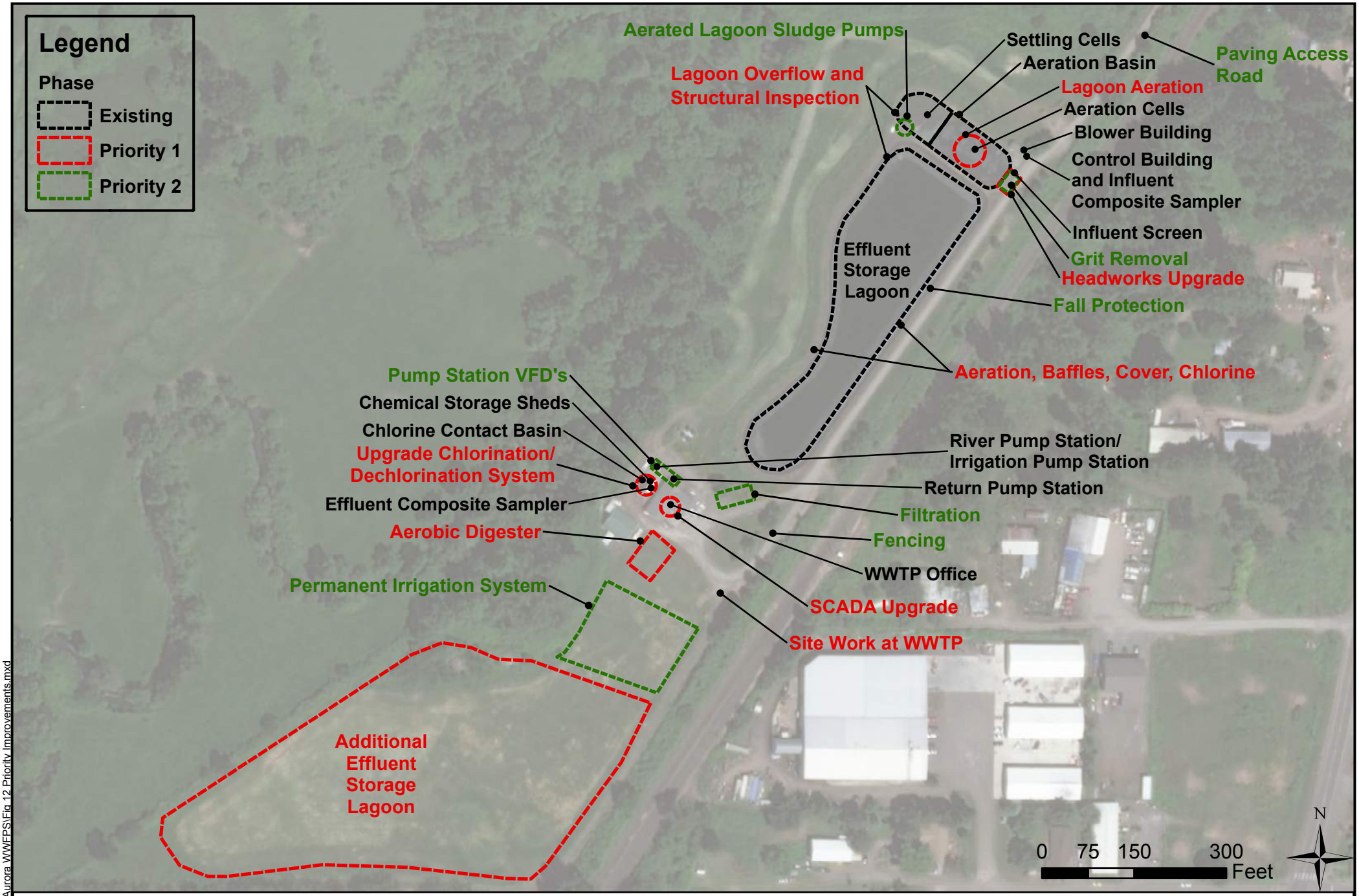


20-Year System Evaluation: Available Capacity in Terms of EDUs Added Upstream of Pipe

Wastewater Facilities Planning Study

Figure 11

City of Aurora, OR
May 2019



Document Path: P:\215120 - Aurora WWFPS\Fig 12 Priority Improvements.mxd

KELLER ASSOCIATES

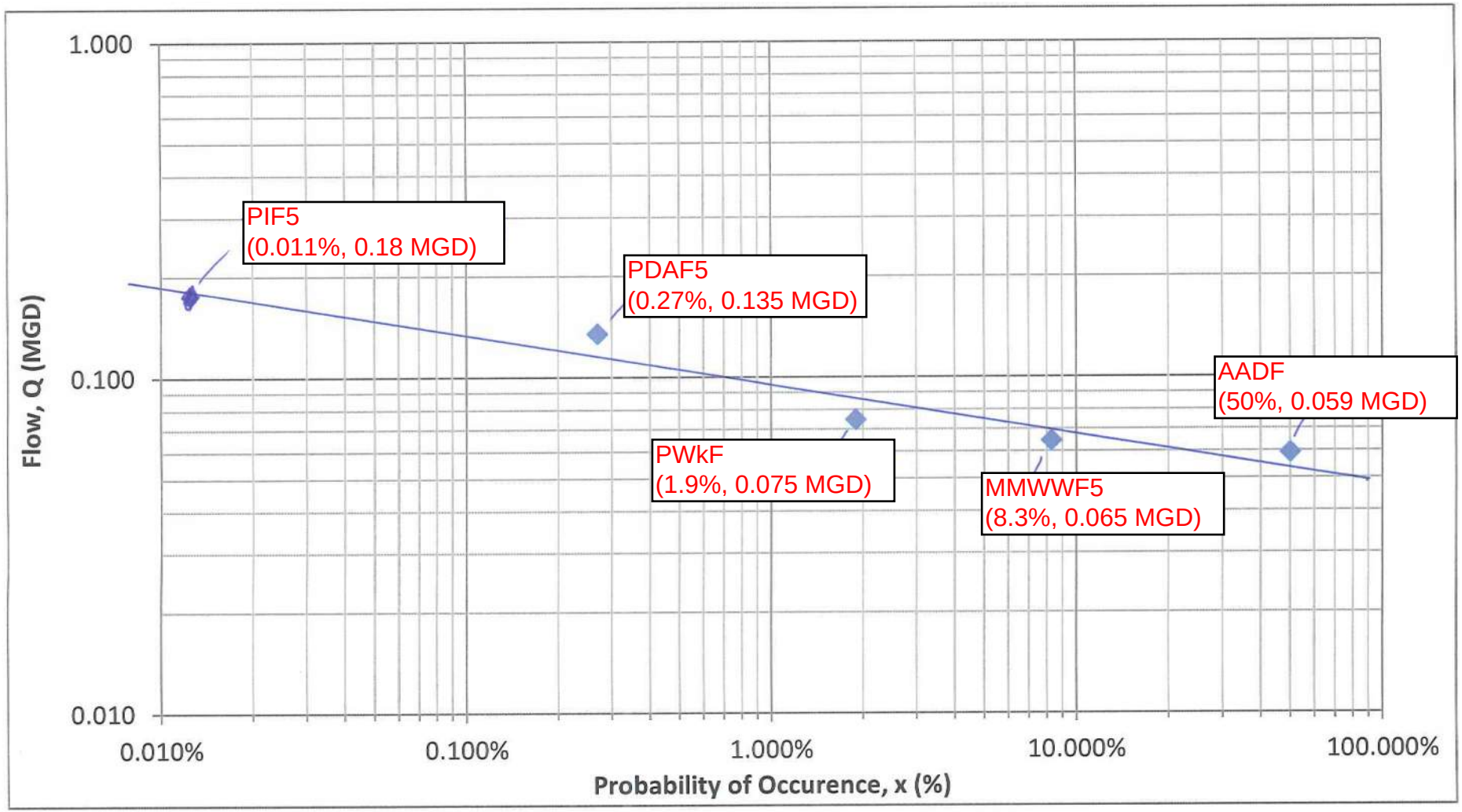
Priority Improvements

Wastewater Facilities Planning Study

Figure 12

City of Aurora, OR
May 2019

Appendix B
Calculations


1.000
0.100
0.010
Flow, Q (MGD)
0.010%
0.100%
1.000%
10.000%
100.000%
Probability of Occurence, x (%)
PIF5
(0.011%, 0.18 MGD)
PDAF5
(0.27%, 0.135 MGD)
PWkF
(1.9%, 0.075 MGD)
MMWWF5
(8.3%, 0.065 MGD)
AADF
(50%, 0.059 MGD)

City of Aurora Water Balance - 2038

Month	Influent WW, gal	Prec./Evap. Gain (Loss), gal	Discharged WW, gal	Net Storage Change, gal	Stored Water, gallons	
Oct	2,276,400	167,065	0	2,443,465	**7,200,000**	*Max. Working Storage Volume (7.2 mg)*
Nov	2,391,000	231,425	15	(2,129,575)	**5,070,425**	
Dec	2,697,000	405,449	15	(1,807,951)	**3,262,474**	
Jan	2,626,000	308,675	15	(1,975,725)	**1,286,749**	
Feb	2,403,000	136,566	14	(1,895,634)	**(608,885)**	
Mar	2,524,000	146,982	15	(1,776,115)	**(2,385,000)**	
Apr	2,462,000	58,989	15	0	**(2,385,000)**	
May	2,751,000	44,137	0	2,795,137	**410,136**	
Jun	2,460,000	(54,972)	0	2,405,028	**2,815,164**	
Jul	2,374,300	(228,389)	0	2,145,911	**4,961,075**	
Aug	2,271,500	(221,663)	0	2,049,837	**7,010,912**	
Sep	2,805,000	(56,327)	0	2,748,673	**9,759,585**	

2038 AADF, mg	*30,041,200*	*937,936*	
2038 AWWF, mg	*15,103,000*	*1,288,086*	
	7,388,050	Additional Storage Reqd	
	4,050,000	Additional Storage Reqd with 6 acres land app (15.5 in/acre, 6 acres, 75% irrigation efficiency = ~3.3 MG)	
	24,380,000	Total Storage Reqd if no winter discharge and land app only during June-end of August due to precip.	

Appendix C
Clean Water Act Data

C-1:
Permit

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT

Oregon Department of Environmental Quality
Western Region – Salem Office
4026 Fairview Industrial Drive
Telephone: 503-378-8240

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act (The Clean Water Act)

ISSUED TO:

Aurora, City of
21420 Main Street
Aurora, Oregon, 97002

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Treated Wastewater	001	Pudding River 45.229121/122.752586 R.M. 8.4
Recycled Water Reuse	002	Land Application
Biosolids	N/A	

FACILITY LOCATION:

21494 Millrace Road
Aurora, Oregon 97002

Treatment System Class: Level II
Collection System Class: Level I

RECEIVING STREAM INFORMATION:

WRD Basin: Willamette
USGS Sub-Basin: Molalla-Pudding
Receiving Stream name: Pudding River
LLID: 1227161452842-8.4-D

County: Marion

EPA REFERENCE NO.: OR004-3991

Issued in response to Application No. 971466 received June 30, 2009. This permit is issued based on the land use findings in the permit record.

Ranei Nomura, Water Quality Manager
Western Region

8/1/2016
Signature Date

8/22/2016
Effective Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to: 1) operate a wastewater collection, treatment, control and disposal system; and 2) discharge treated wastewater to waters of the state only from the authorized discharge point or points in Schedule A in conformance with the requirements, limits, and conditions set forth in this permit.

Unless specifically authorized by this permit, by another NPDES permit, or by Oregon statute or administrative rule, any other direct or indirect discharge of pollutants to waters of the state is prohibited.

TABLE OF CONTENTS

List of Tables

SCHEDULE A: WASTE DISCHARGE LIMITS

1. Outfall 001 – Treated effluent from outfall 001 must meet the following limits:

a. BOD_5 and TSS

i. May 1 – October 31. During this time period the permittee must not discharge to waters of the state.

ii. November 1 – April 30: During this time period the permittee must comply with the limits in the following table:

Table A1: BOD_5 and TSS Limits

Parameter	Average Effluent Concentrations, mg/L		Monthly Average lbs/day	Weekly Average lbs/day	Daily Maximum Lbs
	Monthly	Weekly			
BOD_5	30	45	30	60	140
TSS	50	80	47	90	220

iii. Additional information for the limits in Table A1 above.

(A) Average dry weather design flow to the facility equals 0.087 MGD. Mass load limits are based on 0.087 MGD.

b. Additional Parameters.

The permittee must comply with the limits of the following table:

Table A2: Limits for Additional Parameters

Nov. 1 – Apr. 30	Limits
E. coli Bacteria (see Note a.)	Monthly geometric mean must not exceed 126 organisms per 100 ml. Any single sample must not exceed 406 organisms per 100 ml.
pH	Must be within the range of 6.0 to 9.0 S.U.
BOD5 and TSS Removal Efficiency	Must not be less than 85% monthly average for BOD5, and 65% monthly average for TSS.
Total Residual Chlorine (see Note b.)	Monthly average concentration must not exceed 0.07 mg/L. Daily maximum concentration must not exceed 0.19 mg/L

Notes:

a. Any single *E. coli* sample must not exceed 406 organisms per 100 mL; however, DEQ will not cite a violation of this limit if the permittee takes at least 5 consecutive re-samples at 4 hour intervals, beginning within 28 hours after the original sample was taken, and the geometric mean of the 5 re-samples is less than or equal to 126 *E. coli* organisms/100 mL.

b. When the total residual chlorine limitation is lower than 0.10 mg/l, the Department will use 0.10 mg/l as the compliance evaluation concentration (i.e. daily maximum concentrations below 0.10 mg/l will be considered in compliance with the limitations).

2. Outfall 002 – Reclaimed Wastewater

a. November 1 – April 30: No land application is permitted, unless DEQ approves, in writing.

b. May 1 – October 31: No discharge to state waters is permitted. Facility personnel must distribute all reclaimed water on land, for dissipation by evapotranspiration and controlled seepage, by following sound irrigation practices so as to prevent:

i. Prolonged ponding of treated reclaimed water on the ground surface;

ii. Surface runoff or subsurface drainage through drainage tile;

iii. The creation of odors, fly and mosquito breeding or other nuisance conditions;

iv. Overloading the land with nutrients, organics, or other pollutant parameters; and

v. Impairing existing or potential beneficial groundwater uses.

c. Before land applying the reclaimed water, it must receive at least level II treatment, as defined in OAR 340-055, to reduce Total Coliform to 240 organisms per 100 ml in two consecutive samples, and a seven-day median of 23 organisms per 100 ml.

d. Irrigation must conform to the DEQ-approved reclaimed water use plan.

3. Regulatory Mixing Zone

Pursuant to OAR 340-041-0053, the permittee is granted a regulatory mixing zone as described below:

The allowable mixing zone for the Aurora facility is that portion of the Pudding River, extending from a point 10 feet upstream of the outfall, to a point 25 feet from the east bank of the river, and to a point 108 feet downstream from the outfall. The zone of immediate dilution (ZID) is defined as that portion of the allowable mixing zone that is within 10 feet of the outfall discharge port.

4. Outfall Inspection

During the year 2019, the permittee must inspect outfall 001 and submit a written report to DEQ within the same year regarding the outfall's integrity. The report should include a description of the outfall as originally constructed, the condition of the current outfall, and a discussion of any repairs that would be needed to return the outfall to its originally designed condition.

5. Groundwater Protection

The permittee may not conduct any activities that could cause an adverse impact on existing or potential beneficial uses of groundwater. All wastewater and process related residuals must be managed and disposed of in a manner that will prevent a violation of the Groundwater Quality Protection Rules (OAR Chapter 340, Division 40).

6. Use of Recycled Water

The permittee is authorized to distribute recycled water if it is:

a. Treated and used according to the criteria listed in Table A3.

b. Managed in accordance with its DEQ-approved Recycled Water Use Plan unless exempt as provided in Schedule D, condition 4.

c. Used in a manner and applied at a rate that does not have the potential to adversely impact groundwater quality.

d. Applied at a rate and in accordance with site management practices that assure continued agricultural, horticultural, or silvicultural production and does not reduce the site's productivity.

e. Irrigated using sound irrigation practices to prevent:

i. Offsite surface runoff or subsurface drainage through drainage tile;

ii. Creation of odors, fly and mosquito breeding, or other nuisance conditions; and

iii. Overloading of land with nutrients, organics, or other pollutants.

Table A3: Recycled Water Limits

Class	Level of Treatment (after disinfection unless otherwise specified)	Beneficial Uses
C.	Class C recycled water must be oxidized and disinfected. Total coliform may not exceed: • A median of 23 total coliform organisms per 100 mL, based on results of the last 7 days that analyses have been completed. • 240 total coliform organisms per 100 mL in any two consecutive samples.	Class C recycled water may be used for: • Class D and nondisinfected uses. • Irrigation of processed food crops; irrigation of orchards or vineyards if an irrigation method is used to apply recycled water directly to the soil. • Landscape irrigation of golf courses, cemeteries, highway medians, or industrial or business campuses. • Industrial, commercial, or construction uses limited to: industrial cooling, rock crushing, aggregate washing, mixing concrete, dust control, nonstructural fire fighting using aircraft, street sweeping, or sanitary sewer flushing.

7. Septage Requirements

The permittee must not accept septage at this facility for treatment or processing without written approval from DEQ.

8. Re-opener

Upon EPA approval of a Total Maximum Daily Load (TMDL) addressing any pollutants during the discharge period, this permit may be re-opened to include any waste load allocation (WLA), best management practice or any other condition that the TMDL requires.

SCHEDULE B: MINIMUM MONITORING AND REPORTING REQUIREMENTS

1. Monitoring and Reporting Protocols

a. Quality Assurance and Quality Control (QA/QC)

The permittee must develop and implement a written QA/QC programme to verify the accuracy of sample analysis as specified in 40 CFR Part 136. The QA/QC program must conform to the requirements of 40 CFR Part 136.7. For additional requirements on proper sampling techniques, test methods and QA/QC procedures, see Schedule F, Sections B.1 and C.

b. Re-analysis, Re-sampling and Reporting of Data if QA/QC Requirements Not Met

If QA/QC requirements are not met for any analysis, the permittee must re-analyze the sample. If the sample cannot be re-analysed, the permittee must re-sample as soon as possible. If a sample result does not meet QA/QC requirements, the result must be included in the DMR along with a notation explaining how it does not meet QA/QC requirements, but must not be used in any calculation required by the permit.

c. Reporting Procedures

i. Significant Figures

Mass load limits all have two significant figures unless otherwise noted. The permittee must report the same number of significant digits as the permit limit for a given parameter. Regardless of the rounding conventions used by the permittee (such as rounding 5 up for the calculated results or, in the case of measured values, rounding 5 to the nearest even number), the permittee must use the convention consistently, and must ensure that laboratories employed by the permittee use the same convention.

ii. Calculating Mass Loads

The permittee must calculate mass loads on a daily basis as follows:

Mass Load = Design Flow (in MGD) x Concentration (in mg/L) x 8.34 lbs/gal = Pounds per day.

2. Influent Monitoring and Reporting Requirements

The permittee must monitor influent at the headworks and report results as listed in Table B1 below.

Table B1: Influent Monitoring

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
Total Flow (MGD)	Year-round	Daily	Measurement	Daily Total Monthly Max. Monthly Avg. Monthly Min.
Flow Meter Calibration	Annually	1/year	Verification (see Note a)	January 15
BOD_5 and TSS (mg/L)	Year-round	1 per two weeks	24-hr composite	Daily values Monthly Avg. Monthly Max. Weekly Avg. Max. Weekly Avg.
pH (S.U.)	Year-round	2 per week	Grab	Daily values Monthly Max. Min. daily value

3. Effluent Monitoring and Reporting Requirements

The permittee must monitor effluent flow measurements at the storage pond outlet, upstream of the chlorine contact chamber. The permittee must collect composite samples, bacteria samples, final chlorine residual samples, and all samples for toxics, just after the dechlorination tank, and before the effluent pump station, before discharge to the river or the irrigation site. The permittee must report results as listed in Table B2 below.

Table B2: Effluent Monitoring, Outfall 001

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
Total Flow (MGD)	Nov. – Apr.	Daily	Measurement	Daily Total Monthly Max. Monthly Avg. Monthly Min.
Flow Meter Calibration	Nov. – Apr.	Annually	Verification	January 15
BOD_5 and TSS (mg/L)	Nov. – Apr.	1 per two weeks	Composite	Daily values Monthly Avg. Monthly Max. Weekly Avg. Max. Weekly Avg.
BOD_5 and TSS Mass Load (lb/day)	Nov. – Apr.	1 per two weeks	Calculation	Daily values Monthly Avg. Weekly Avg. Max. Weekly Avg. Monthly Max.
BOD_5 and TSS Percent Removal	Nov. - Apr.	Monthly	Calculation	Monthly Avg.

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
pH (S.U.)	Nov. - Apr.	2 per week	Grab	Daily values Monthly Max. Min. Daily value
Temperature (°C)	Nov. – Apr.	2 per week	Grab	Max. Daily value
E. coli (#/100 mL)	Nov. – Apr.	1 per two weeks	Grab	Daily values Monthly Max. Monthly Geo. Mean Geo. Mean of re-samples
Chlorine Used (lbs/day)	Nov. – Apr.	Daily	Grab	Daily values Monthly Avg.
Chlorine, Total Residual (mg/L)	Nov. – Apr.	Daily	Grab	Daily values Monthly Max. Monthly Avg.
Storage Lagoon Depth (feet)	Nov. – Apr.	Daily	Record	Daily values

4. Recycled Water Monitoring Requirements: Outfall 002

The permittee must monitor recycled water as listed in Table B3 below. The samples must be representative of the recycled water delivered for beneficial reuse at a location identified in the Recycled Water Use Plan.

Table B3: Recycled Water Monitoring

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
Quantity Irrigated (inches/acre)	May - Oct.	Daily	Measurement	Daily values
Flow Meter Calibration	May – Oct.	Annually	Verification	January 15
Quantity Chlorine Used (lbs)	May – Oct.	Daily	Grab	Daily values Monthly Avg.
Chlorine, Total Residual (mg/L)	May – Oct.	Daily	Grab	Daily values Monthly Max. Monthly Avg.
pH	May - Oct.	2/Week	Grab	Daily values Monthly Max. Min. Daily value
E. coli (#/100 mL)	May - Oct.	Weekly	Grab	Daily values Monthly Max. Monthly Geo. Mean Geo. Mean of re-samples
Nutrients (TKN,	May - Oct.	Quarterly	Grab	Quarterly values

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
NO_2+NO_3-N, NH_3, Total Phosphorus)				Quarterly Avg. Quarterly Max.

5. Permit Application Monitoring Requirements

The permittee must monitor their final effluent for the pollutants listed in Table B4 in November, January, March and May, 2019. The results must be submitted with the applicable DMR.

Table B4: Effluent Monitoring Required for NPDES Permit Application

(a minimum of 3 scans required)

Parameter
Ammonia (as N)
Dissolved Oxygen
Total Kjeldahl Nitrogen (TKN)
Nitrate Plus Nitrite Nitrogen
Oil and Grease

6. Minimum Reporting Requirements

The permittee must report monitoring results as listed in Table B5 below.

Table B5: Reporting Requirements and Due Dates

Reporting Requirement	Frequency	Due Date (see note a.)	Report Form (unless otherwise specified in writing)	Submit To:
1. Table B1: Influent Monitoring 2. Table B2: Effluent Monitoring	Monthly	15th day of the month following data collection	DEQ-approved discharge monitoring report (DMR) form, electronic and hardcopy. (See Notes b. and c.)	DEQ Regional Office
1. Recycled water annual report describing effectiveness of recycled water system in complying with the DEQ-approved recycled water use plan, OAR 340-055, and this permit. See Schedule D for more detail. 2. Table B3: Recycled Water Monitoring	Annually	January 15	2 hard copies, electronic copy	One each to: • DEQ Regional Office • DEQ Water Reuse Program Coordinator
Wastewater solids annual report describing quality, quantity, and use or disposal of wastewater solids generated at the facility.	Annually	February 19	2 hard copies, electronic hardcopy	One each to: • DEQ Regional Office • DEQ Biosolids Program Coordinator
Inflow and infiltration report (see Schedule D, Section 1	Annually	February 1	1 hard copy, electronic copy	DEQ Regional Office
Significant Industrial User Survey	Every 5 years		1 hard copy, electronic copy	DEQ Regional Office

Reporting Requirement	Frequency	Due Date (see note a.)	Report Form (unless otherwise specified in writing)	Submit To:
Outfall Inspection Report	Every 5 years	3rd year of permit term	1 hard copy, electronic copy	DEQ Regional Office

Notes:

a. For submittals that are provided to DEQ by mail, the postmarked date must not be later than the due date.

b. Name, certificate classification, and grade level of each responsible principal operator as well as identification of each system classification must be included on DMRs. Font size must not be less than 10 pt.

c. Equipment breakdowns and bypass events must be noted on DMRs.

SCHEDULE D: SPECIAL CONDITIONS

1. Inflow and Infiltration

An annual inflow and infiltration report must be submitted to DEQ as directed in Schedule B. The report must include the following:

a. Details of activities performed in the previous year to identify and reduce inflow and infiltration.

b. Details of activities planned for the following year to identify and reduce inflow and infiltration.

c. A summary of sanitary sewer overflows that occurred during the previous year.

2. Emergency Response and Public Notification Plan

The permittee must develop and maintain an Emergency Response and Public Notification Plan (the Plan) per Schedule F, Section B, and Conditions 7 & 8. The permit holder must develop the plan within six months of permit issuance and update the Plan annually to ensure that telephone and email contact information for applicable public agencies (permit writer should include specific contacts here as needed) are current and accurate. An updated copy of the plan must be kept on file at the wastewater treatment facility for Department review. The latest plan revision date must be listed on the Plan cover along with the reviewer's initials or signature.

3. Recycled Water Use Plan

a. To distribute recycled water for reuse, the permittee must have and maintain a DEQ-approved Recycled Water Use Plan meeting the requirements in OAR 340-055-0025. The permittee must submit substantial modifications to an existing plan to DEQ for approval at least 60 days before making the proposed changes. Conditions in the plan are enforceable requirements under this permit.

b. Recycled Water Annual Report – The permittee must submit a recycled water annual report by the date specified in Table B.5.: Reporting Requirements and Due Dates. This report must describe the effectiveness of the system to comply with the approved recycled water use plan, the rules included in OAR 340-055, and the permit limits and conditions for recycled water contained in Schedule A, Condition 5. The plan must also include the monitoring data for the previous year required under Schedule B, Condition 6.

4. Exempt Wastewater Reuse at the Treatment System

The permittee is exempt from the recycled water use requirements in OAR 340-055 when recycled water is used at the wastewater treatment system for landscape irrigation or for in-plant processes at a wastewater treatment system, and all of the following conditions are met:

a. The recycled water is an oxidized and disinfected wastewater.

b. The recycled water is used at the wastewater treatment system site where it is generated or at an auxiliary wastewater or sludge treatment facility that is subject to the same NPDES or WPCF permit as the wastewater treatment system. Contiguous property to the parcel of land upon which the treatment system is located is considered the wastewater treatment system site if under the same ownership.

c. Spray or drift or both from the use does not occur off the site.

d. Public access to the site is restricted.

5. Wastewater Solids Transfers

a. *Within state.* The permittee may transfer wastewater solids including Class A and Class B biosolids, to another facility permitted to process or dispose of wastewater solids, including but not limited to: another wastewater treatment facility, landfill, or incinerator. The permittee must monitor, report, and dispose of solids as required under the permit of the receiving facility.

b. *Out of state.* If wastewater solids, including Class A and Class B biosolids, are transferred out of state for use or disposal, the permittee must obtain written authorization from DEQ, meet Oregon requirements for the use or disposal of wastewater solids, notify in writing the receiving state of the proposed use or disposal of wastewater solids, and satisfy the requirements of the receiving state.

6. Operator Certification

a. Definitions

i. "Supervise" means to have full and active responsibility for the daily on site technical operation of a wastewater treatment system or wastewater collection system.

ii. "Supervisor" or "designated operator", means the operator delegated authority by the permittee for establishing and executing the specific practice and procedures for operating the wastewater treatment system or wastewater collection system in accordance with the policies of the owner of the system and any permit requirements.

iii. "Shift Supervisor" means the operator delegated authority by the permittee for executing the specific practice and procedures for operating the wastewater treatment system or wastewater collection system when the system is operated on more than one daily shift.

iv. "System" includes both the collection system and the treatment systems.

b. The permittee must comply with OAR Chapter 340, Division 49, "Regulations Pertaining to Certification of Wastewater System Operator Personnel" and designate a supervisor whose certification corresponds with the classification of the collection and/or treatment system as specified on p. 1 of this permit.

c. The permittee must have its system supervised full-time by one or more operators who hold a valid certificate for the type of wastewater treatment or wastewater collection system, and at a grade equal to or greater than the wastewater system's classification as specified on p. 1 one of this permit.

d. The permittee's wastewater system may not be without the designated supervisor for more than 30 days. During this period, there must be another person available to supervise who is certified at no more than one grade lower than the classification of the wastewater system. The permittee must delegate authority to this operator to supervise the operation of the system.

e. If the wastewater system has more than one daily shift, the permittee must have another properly certified operator available to supervise operation of the system. Each shift supervisor, if any, must be certified at no more than one grade lower than the system classification.

f. The permittee is not required to have a supervisor on site at all times; however, the supervisor must be available to the permittee and operator at all times.

g. The permittee must notify DEQ in writing of the name of the system supervisor. The permittee may replace or re-designate the system supervisor with another properly certified operator at any time and must notify DEQ in writing within 30 days of replacement or re-designation of operator in charge. As of this writing, the notice of replacement or re-designation must be sent to Water Quality Division, Operator Certification Program, 700 NE Multnomah Street, Suite 600, Portland, OR 97232. This address may be updated in writing by DEQ during the term of this permit.

h. When compliance with item (e) of this section is not possible or practicable because the system supervisor is not available or the position is vacated unexpectedly, and another certified operator is not qualified to assume supervisory responsibility, the Director may grant a time extension for compliance with the requirements in response to a written request from the system owner. The Director will not grant an extension longer than 120 days unless the system owner documents the existence of extraordinary circumstances.

7. Industrial User Survey

The permittee must conduct an industrial user survey to determine the presence of any industrial users discharging wastewaters subject to pretreatment and submit a report on the findings to DEQ within 24 months of permit issuance. The purpose of the survey is to identify if there are any categorical industrial users discharging to the POTW, and assure regulatory oversight of these discharges to state waters. If the permittee has already completed a baseline IU Survey, the permittee must provide the survey results to DEQ within two months of permit re-issuance.

Guidance on conducting IU Surveys can be found at

http://www.deq.state.or.us/wq/pretreatment/docs/guidance/IUSurveyGuidance.pdf

After the permittee conducts an initial baseline IU Survey, the permittee must maintain the survey results and make them available for DEQ inspection. Every 5 years from permit renewal, the permittee must submit an updated IU survey.

SCHEDULE F
NPDES GENERAL CONDITIONS – DOMESTIC FACILITIES
October 1, 2015 Version

SECTION A. STANDARD CONDITIONS

A1. Duty to Comply with Permit

The permittee must comply with all conditions of this permit. Failure to comply with any permit condition is a violation of Oregon Revised Statutes (ORS) 468B.025 and the federal Clean Water Act and is grounds for an enforcement action. Failure to comply is also grounds for DEQ to terminate, modify and reissue, revoke, or deny renewal of a permit.

A2. Penalties for Water Pollution and Permit Condition Violations

The permit is enforceable by DEQ or EPA, and in some circumstances also by third-parties under the citizen suit provisions of 33 USC § 1365. DEQ enforcement is generally based on provisions of state statutes and Environmental Quality Commission (EQC) rules, and EPA enforcement is generally based on provisions of federal statutes and EPA regulations.

ORS 468.140 allows DEQ to impose civil penalties up to $25,000 per day for violation of a term, condition, or requirement of a permit. The federal Clean Water Act provides for civil penalties not to exceed $37,500 and administrative penalties not to exceed $16,000 per day for each violation of any condition or limitation of this permit.

Under ORS 468.943, unlawful water pollution in the second degree, is a Class A misdemeanor and is punishable by a fine of up to $25,000, imprisonment for not more than one year, or both. Each day on which a violation occurs or continues is a separately punishable offense. The federal Clean Water Act provides for criminal penalties of not more than $50,000 per day of violation, or imprisonment of not more than 2 years, or both for second or subsequent negligent violations of this permit.

Under ORS 468.946, unlawful water pollution in the first degree is a Class B felony and is punishable by a fine of up to $250,000, imprisonment for not more than 10 years, or both. The federal Clean Water Act provides for criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment of not more than 3 years, or both for knowing violations of the permit. In the case of a second or subsequent conviction for knowing violation, a person is subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

A3. Duty to Mitigate

The permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit. In addition, upon request of DEQ, the permittee must correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

A4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application must be submitted at least 180 days before the expiration date of this permit.

DEQ may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

A5. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

a. Violation of any term, condition, or requirement of this permit, a rule, or a statute.
b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts.
c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
d. The permittee is identified as a Designated Management Agency or allocated a wasteload under a total maximum daily load (TMDL).
e. New information or regulations.
f. Modification of compliance schedules.
g. Requirements of permit reopener conditions
h. Correction of technical mistakes made in determining permit conditions.
i. Determination that the permitted activity endangers human health or the environment.
j. Other causes as specified in 40 CFR §§ 122.62, 122.64, and 124.5.
k. For communities with combined sewer overflows (CSOs):
   (1) To comply with any state or federal law regulation for CSOs that is adopted or promulgated subsequent to the effective date of this permit.
   (2) If new information that was not available at the time of permit issuance indicates that CSO controls imposed under this permit have failed to ensure attainment of water quality standards, including protection of designated uses.
   (3) Resulting from implementation of the permittee's long-term control plan and/or permit conditions related to CSOs.

The filing of a request by the permittee for a permit modification, revocation or reissuance, termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

A6. Toxic Pollutants

The permittee must comply with any applicable effluent standards or prohibitions established under Oregon Administrative Rule (OAR) 340-041-0033 and section 307(a) of the federal Clean Water Act for toxic pollutants, and with standards for sewage sludge use or disposal established under section 405(d) of the federal Clean Water Act, within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

A7. Property Rights and Other Legal Requirements

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, or authorize any injury to persons or property or invasion of any other private rights, or any infringement of federal, tribal, state, or local laws or regulations.

A8. Permit References

Except for effluent standards or prohibitions established under section 307(a) of the federal Clean Water Act and OAR 340-041-0033 for toxic pollutants, and standards for sewage sludge use or disposal established under section 405(d) of the federal Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

A9. Permit Fees

The permittee must pay the fees required by OAR.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

B1. Proper Operation and Maintenance

The permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

B2. Need to Halt or Reduce Activity Not a Defense

For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permittee must, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It is not a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

B3. Bypass of Treatment Facilities

a. Definitions
   (1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs b and c of this section.
   (2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Prohibition of bypass.
   (1) Bypass is prohibited and DEQ may take enforcement action against a permittee for bypass unless:
      i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
      ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventative maintenance; and
      iii. The permittee submitted notices and requests as required under General Condition B3.c.
   (2) DEQ may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, if DEQ determines that it will meet the three conditions listed above in General Condition B3.b.(1).

c. Notice and request for bypass.
   (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, a written notice must be submitted to DEQ at least ten days before the date of the bypass.
   (2) Unanticipated bypass. The permittee must submit notice of an unanticipated bypass as required in General Condition D5.

B4. Upset

a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by

operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of General Condition B4.c are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
   (1) An upset occurred and that the permittee can identify the causes(s) of the upset;
   (2) The permitted facility was at the time being properly operated;
   (3) The permittee submitted notice of the upset as required in General Condition D5, hereof (24-hour notice); and
   (4) The permittee complied with any remedial measures required under General Condition A3 hereof.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

B5. Treatment of Single Operational Upset

For purposes of this permit, a single operational upset that leads to simultaneous violations of more than one pollutant parameter will be treated as a single violation. A single operational upset is an exceptional incident that causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one federal Clean Water Act effluent discharge pollutant parameter. A single operational upset does not include federal Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational upset is a violation.

B6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definition. "Overflow" means any spill, release or diversion of sewage including:
   (1) An overflow that results in a discharge to waters of the United States; and
   (2) An overflow of wastewater, including a wastewater backup into a building (other than a backup caused solely by a blockage or other malfunction in a privately owned sewer or building lateral), even if that overflow does not reach waters of the United States.

b. Reporting required. All overflows must be reported orally to DEQ within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D5.

B7. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs that threatens public health, the permittee must take such steps as are necessary to alert the public, health agencies and other affected entities (for example, public water systems) about the extent and nature of the discharge in accordance with the notification procedures developed under General Condition B8. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

B8. Emergency Response and Public Notification Plan

The permittee must develop and implement an emergency response and public notification plan that identifies measures to protect public health from overflows, bypasses, or upsets that may endanger public health. At a minimum the plan must include mechanisms to:

a. Ensure that the permittee is aware (to the greatest extent possible) of such events;

b. Ensure notification of appropriate personnel and ensure that they are immediately dispatched for investigation and response;
c. Ensure immediate notification to the public, health agencies, and other affected public entities (including public water systems). The overflow response plan must identify the public health and other officials who will receive immediate notification;
d. Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained;
e. Provide emergency operations; and
f. Ensure that DEQ is notified of the public notification steps taken.

B9. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must be disposed of in such a manner as to prevent any pollutant from such materials from entering waters of the state, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

C1. Representative Sampling

Sampling and measurements taken as required herein must be representative of the volume and nature of the monitored discharge. All samples must be taken at the monitoring points specified in this permit, and must be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points must not be changed without notification to and the approval of DEQ. Samples must be collected in accordance with requirements in 40 CFR part 122.21 and 40 CFR part 403 Appendix E.

C2. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices must be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices must be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected must be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

C3. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR part 136 or, in the case of sludge (biosolids) use and disposal, approved under 40 CFR part 503 unless other test procedures have been specified in this permit.

For monitoring of recycled water with no discharge to waters of the state, monitoring must be conducted according to test procedures approved under 40 CFR part 136 or as specified in the most recent edition of Standard Methods for the Examination of Water and Wastewater unless other test procedures have been specified in this permit or approved in writing by DEQ.

C4. Penalties for Tampering

The federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit may, upon conviction, be punished by a fine of not more than $10,000 per violation, imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both.

C5. Reporting of Monitoring Results
Monitoring results must be summarized each month on a discharge monitoring report form approved by DEQ. The reports must be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

C6. Additional Monitoring by the Permittee
If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR part 136 or, in the case of sludge (biosolids) use and disposal, approved under 40 CFR part 503, or as specified in this permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the discharge monitoring report. Such increased frequency must also be indicated. For a pollutant parameter that may be sampled more than once per day (for example, total residual chlorine), only the average daily value must be recorded unless otherwise specified in this permit.

C7. Averaging of Measurements
Calculations for all limitations that require averaging of measurements must utilize an arithmetic mean, except for bacteria which must be averaged as specified in this permit.

C8. Retention of Records
Records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities must be retained for a period of at least 5 years (or longer as required by 40 CFR part 503). Records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete the application for this permit must be retained for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of DEQ at any time.

C9. Records Contents
Records of monitoring information must include:
a. The date, exact place, time, and methods of sampling or measurements;
b. The individual(s) who performed the sampling or measurements;
c. The date(s) analyses were performed;
d. The individual(s) who performed the analyses;
e. The analytical techniques or methods used; and
f. The results of such analyses.

C10. Inspection and Entry
The permittee must allow DEQ or EPA upon the presentation of credentials to:
a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
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.

C11. Confidentiality of Information
Any information relating to this permit that is submitted to or obtained by DEQ is available to the public unless classified as confidential by the Director of DEQ under ORS 468.095. The permittee may request that

information be classified as confidential if it is a trade secret as defined by that statute. The name and address of the permittee, permit applications, permits, effluent data, and information required by NPDES application forms under 40 CFR § 122.21 are not classified as confidential [40 CFR § 122.7(b)].

SECTION D. REPORTING REQUIREMENTS

D1. Planned Changes

The permittee must comply with OAR 340-052, "Review of Plans and Specifications" and 40 CFR § 122.41(l)(1). Except where exempted under OAR 340-052, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers may be commenced until the plans and specifications are submitted to and approved by DEQ. The permittee must give notice to DEQ as soon as possible of any planned physical alternations or additions to the permitted facility.

D2. Anticipated Noncompliance

The permittee must give advance notice to DEQ of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

D3. Transfers

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and EQC rules. No permit may be transferred to a third party without prior written approval from DEQ. DEQ may require modification, revocation, and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under 40 CFR § 122.61. The permittee must notify DEQ when a transfer of property interest takes place.

D4. Compliance Schedule

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

D5. Twenty-Four Hour Reporting

The permittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally (by telephone) to the DEQ regional office or Oregon Emergency Response System (1-800-452-0311) as specified below within 24 hours from the time the permittee becomes aware of the circumstances.

a. Overflows.
   (1) Oral Reporting within 24 hours.
      i. For overflows other than basement backups, the following information must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311. For basement backups, this information should be reported directly to the DEQ regional office.
         (a) The location of the overflow;
         (b) The receiving water (if there is one);
         (c) An estimate of the volume of the overflow;
         (d) A description of the sewer system component from which the release occurred (for example, manhole, constructed overflow pipe, crack in pipe); and
         (e) The estimated date and time when the overflow began and stopped or will be stopped.
      ii. The following information must be reported to the DEQ regional office within 24 hours, or during normal business hours, whichever is earlier:
         (a) The OERS incident number (if applicable); and

(b) A brief description of the event.

(2) Written reporting postmarked within 5 days.

i. The following information must be provided in writing to the DEQ regional office within 5 days of the time the permittee becomes aware of the overflow:

(a) The OERS incident number (if applicable);

(b) The cause or suspected cause of the overflow;

(c) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;

(d) Steps taken or planned to mitigate the impact(s) of the overflow and a schedule of major milestones for those steps; and

(e) For storm-related overflows, the rainfall intensity (inches/hour) and duration of the storm associated with the overflow.

DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

b. Other instances of noncompliance.

(1) The following instances of noncompliance must be reported:

i. Any unanticipated bypass that exceeds any effluent limitation in this permit;

ii. Any upset that exceeds any effluent limitation in this permit;

iii. Violation of maximum daily discharge limitation for any of the pollutants listed by DEQ in this permit; and

iv. Any noncompliance that may endanger human health or the environment.

(2) During normal business hours, the DEQ regional office must be called. Outside of normal business hours, DEQ must be contacted at 1-800-452-0311 (Oregon Emergency Response System).

(3) A written submission must be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission must contain:

i. A description of the noncompliance and its cause;

ii. The period of noncompliance, including exact dates and times;

iii. The estimated time noncompliance is expected to continue if it has not been corrected;

iv. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and

v. Public notification steps taken, pursuant to General Condition B7.

(4) DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

D6. Other Noncompliance

The permittee must report all instances of noncompliance not reported under General Condition D4 or D5 at the time monitoring reports are submitted. The reports must contain:

a. A description of the noncompliance and its cause;

b. The period of noncompliance, including exact dates and times;

c. The estimated time noncompliance is expected to continue if it has not been corrected; and

d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

D7. Duty to Provide Information

The permittee must furnish to DEQ within a reasonable time any information that DEQ may request to determine compliance with the permit or to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit. The permittee must also furnish to DEQ, upon request, copies of records required to be kept by this permit.

Other Information: When the permittee becomes aware that it has failed to submit any relevant facts or has submitted incorrect information in a permit application or any report to DEQ, it must promptly submit such facts or information.

D8. Signatory Requirements
All applications, reports or information submitted to DEQ must be signed and certified in accordance with 40 CFR § 122.22.

D9. Falsification of Information
Under ORS 468.953, any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, is subject to a Class C felony punishable by a fine not to exceed $125,000 per violation and up to 5 years in prison per ORS chapter 161. Additionally, according to 40 CFR § 122.41(k)(2), any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or non-compliance will, upon conviction, be punished by a federal civil penalty not to exceed $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

D10. Changes to Indirect Dischargers
The permittee must provide adequate notice to DEQ of the following:
a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the federal Clean Water Act if it were directly discharging those pollutants and;
b. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
c. For the purposes of this paragraph, adequate notice must include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

SECTION E. DEFINITIONS

E1. *BOD* or BOD_5 means five-day biochemical oxygen demand.
E2. *CBOD* or $CBOD_5$ means five-day carbonaceous biochemical oxygen demand.
E3. *TSS* means total suspended solids.
E4. *Bacteria* means but is not limited to fecal coliform bacteria, total coliform bacteria, *Escherichia coli* (*E. coli*) bacteria, and *Enterococcus* bacteria.
E5. *FC* means fecal coliform bacteria.
E6. *Total residual chlorine* means combined chlorine forms plus free residual chlorine
E7. *Technology based permit effluent limitations* means technology-based treatment requirements as defined in 40 CFR § 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-041.
E8. *mg/l* means milligrams per liter.
E9. *µg/l* means microgram per liter.
E10. *kg* means kilograms.
E11. m^3/d means cubic meters per day.
E12. *MGD* means million gallons per day.
E13. *Average monthly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

E14. *Average weekly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

E15. *Daily discharge* as defined at 40 CFR § 122.2 means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge must be calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge must be calculated as the average measurement of the pollutant over the day.

E16. *24-hour composite sample* means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow.

E17. *Grab sample* means an individual discrete sample collected over a period of time not to exceed 15 minutes.

E18. *Quarter* means January through March, April through June, July through September, or October through December.

E19. *Month* means calendar month.

E20. *Week* means a calendar week of Sunday through Saturday.

E21. *POTW* means a publicly-owned treatment works.

C-2:
Permit Modification

MODIFICATION #1
This modification is attached to and a part of permit #101772

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT
Oregon Department of Environmental Quality
Western Region – Salem Office
4026 Fairview Industrial Dr., Salem OR 97302
Telephone: 503-378-8240

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

ISSUED TO:
Aurora, City of
21420 Main Street
Aurora, Oregon, 97002

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Treated Wastewater	001	Pudding River 45.229121/122.752586 R.M. 8.4
Recycled Water Reuse	002	Land Application
Biosolids	N/A	

FACILITY LOCATION:

21494 Millrace Road
Aurora, Oregon 97002

Treatment System Class: Level II
Collection System Class: Level I

RECEIVING STREAM INFORMATION:
WRD Basin: Willamette
USGS Sub-Basin: Molalla-Pudding
Receiving Stream name: Pudding River
LLID: 1227161452842-8.4-D

County: Marion

EPA REFERENCE NO.: OR0043991

This is a DEQ-initiated modification issued in accordance with Oregon Administrative Rules 340-045-0055. The permit was originally issued on 8/1/2016 in response to application #971466 received 6/30/2009 and is based on the land use findings in the permit record.

Ranei Nomura, Water Quality Manager
Western Region

8/24/2016
Signature Date

9/13/2016
Effective Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to: 1) operate a wastewater collection, treatment, control and disposal system; and 2) discharge treated wastewater to waters of the state only from the authorized discharge point or points in Schedule A in conformance with the requirements, limits, and conditions set forth in this permit.

Unless specifically authorized by this permit, by another NPDES permit, or by Oregon statute or administrative rule, any other direct or indirect discharge of pollutants to waters of the state is prohibited.

MODIFICATIONS TO SCHEDULE B: MINIMUM MONITORING AND REPORTING REQUIREMENTS

This minor permit modification is to correct two typographical errors in Schedule B. The first correction is to Table B3 below. The text to be deleted is in strikeout font, and the correct text is in regular font, directly below.

Table B3: Recycled Water Monitoring

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
Quantity Irrigated (inches/acre)	May - Oct.	Daily	Measurement	Daily values
Flow Meter Calibration	May – Oct.	Annually	Verification	January 15
Quantity Chlorine Used (lbs)	May – Oct.	Daily	Grab	Daily values Monthly Avg.
Chlorine, Total Residual (mg/L)	May – Oct.	Daily	Grab	Daily values Monthly Max. Monthly Avg.
pH	May - Oct.	2/Week	Grab	Daily values Monthly Max. Min. Daily value
~~*E. coli* (#/100 mL)~~ Total coliform	May - Oct.	Weekly	Grab	Daily values Monthly Max. Monthly Geo. Mean Geo. Mean of re-samples
Nutrients (TKN, NO_2+NO_3-N, NH_3, Total Phosphorus)	May - Oct.	Quarterly	Grab	Quarterly values Quarterly Avg. Quarterly Max.

The second correction is to condition 5. The text to be deleted is in strikeout font.

5. Permit Application Monitoring Requirements

The permittee must monitor their final effluent for the pollutants listed in Table B4 in January, March, May and November, 2019. The results must be submitted with the applicable DMR.

Table B4: Effluent Monitoring Required for NPDES Permit Application

~~(a minimum of 3 scans required)~~

Parameter
Ammonia (as N)
Dissolved Oxygen
Total Kjeldahl Nitrogen (TKN)
Nitrate Plus Nitrite Nitrogen
Oil and Grease

This correction eliminates confusion about the requirement to monitor in January, March, May and November, 2019.

C-3:
Permit Evaluation Report

Permit Evaluation Report

Oregon Department of Environmental Quality
Northwest Region Office
700 NE Multnomah Street, Suite 600
Portland OR 97232

State of Oregon Department of Environmental Quality

Contact: David Cole

Permittee:	City of Aurora 21420 Main Street Aurora, Oregon, 97002
Existing Permit Information:	File Number: 100020 Permit Number: 101772 Expiration Date: 12/31/2009 EPA Reference Number: OR004-3991
Source Contact:	Darrel Lockard, 541-222-9997 Wastewater Treatment Plant Operator
Facility Location:	21494 Millrace Road Aurora, Oregon Marion County
LLID:	1227161452842-8.4-D
Receiving Stream/Basin:	Pudding River Willamette Basin Molalla-Pudding Sub-Basin
Proposed Action:	Renew Permit Application Number: 971466 Date Received: June 30, 2009
Source Category:	NPDES Minor – Domestic
Sources Covered:	Treated Wastewater
Permit Type:	NPDES Domestic
Permit Writer:	David Cole Water Quality Specialist/Western Region/Water Quality Section Date Prepared: 6/1/2016

City of Aurora
NPDES Permit Renewal

Table of Contents

Figures

Tables

City of Aurora
NPDES Permit Renewal

1.0 Introduction

The Department of Environmental Quality (DEQ) proposes to renew the National Pollutant Discharge Elimination System (NPDES) wastewater permit for the city of Aurora, located at 21420 Main Street NE, Aurora, Oregon, 97002. This permit allows and regulates the discharge of treated wastewater to the Pudding River. The permit also authorizes the city of Aurora to recycle the treated effluent as irrigation water for city owned property immediately adjacent to the facility from May 1st through October 31st.

The purpose of this permit evaluation report is to explain and provide justification for the permit.

The Federal Water Pollution Control Act of 1972 (also known as the Clean Water Act) and its subsequent amendments, as well as Oregon Revised Statutes (ORS 468B.050), require a NPDES permit for the discharge of wastewater to surface waters. This proposed permit action by DEQ complies with both federal and state requirements.

2.0 Permit History

2.1 Issuance, Renewal and Modifications

The current NPDES Permit expired on December 31, 2009. DEQ received renewal application number 971466 from the city of Aurora on June 30, 2009. Because the permittee submitted a renewal application to DEQ in a timely manner, the current permit will not expire until DEQ takes final action on the renewal application as per OAR 340-045-0040.

2.2 Compliance History

DEQ reviewed the facility's compliance history for the time period including the current permit cycle, through the present. During this time period DEQ issued two warning letters for BOD, TSS and chlorine residual permit violations. None of these resulted in any enforcement action.

On June 9, 2014, DEQ conducted the most recent facility inspection. The DEQ inspectors noted the following violations:

- No QA/QC plan for in-house testing.
- No annual reports submitted for I&I, recycled water reuse and flow meter calibration.

On July 1, 2014, the facility operator submitted information to DEQ that resolved these issues to DEQ's satisfaction.

During the current permit cycle the facility has satisfactorily addressed all of the conditions of the permit's Schedule C Compliance Schedule.

Proposed Revisions to Permit

The proposed permit contains the following substantive changes from the 2005 permit:

- Schedule A:

1. The average dry weather design flow is 0.087 MGD.
2. The monthly average concentration limit for total residual chlorine is 0.07 mg/L.
3. The daily maximum concentration limit for total residual chlorine is 0.19 mg/L.
4. During the year 2019, the permittee must inspect outfall 001 and submit a written report to DEQ within the same year regarding the outfall's integrity.

- Schedule B:
  1. Table B4, Effluent Monitoring Required for NPDES Permit Application (minimum of 3 scans).
  2. Table B5, Reporting Requirements and Due Dates. Added a requirement to conduct a Significant Industrial User Survey once every five years.
- Schedule C – The permittee has complied with all Schedule C requirements. The proposed renewal permit has no Schedule C requirements.
- Schedule D – Added a section on conducting an Industrial User Survey.

3.0 Facility Description

3.1 Wastewater Facility Description

The facility is located at 21494 Millrace Road, about ½ mile south of the intersection of Millrace Road with Ehlen Road (see Figure 1). The facility consists of a conventional gravity sewer collection system with three lift stations equipped with alarms and telemetry, 4" force mains, a six cell lagoon (consisting of four aerated cells and two settling basin cells), a final storage lagoon, and chlorination for disinfection with de-chlorination to meet toxicity requirements (see Appendix A for the facility's flow diagram schematic).

Treated effluent is pumped and discharged through a single-port submerged diffuser into the Pudding River at River Mile (RM) 8.4 during the winter discharge season from November 1 through April 30. Previous permits and evaluation reports have listed the outfall location at RM 9.2. In 2008 DEQ collected latitude and longitude coordinates for many outfalls around the state, including Aurora's. Based on this information and DEQ's LLID tool, the correct RM for the outfall is 8.4.

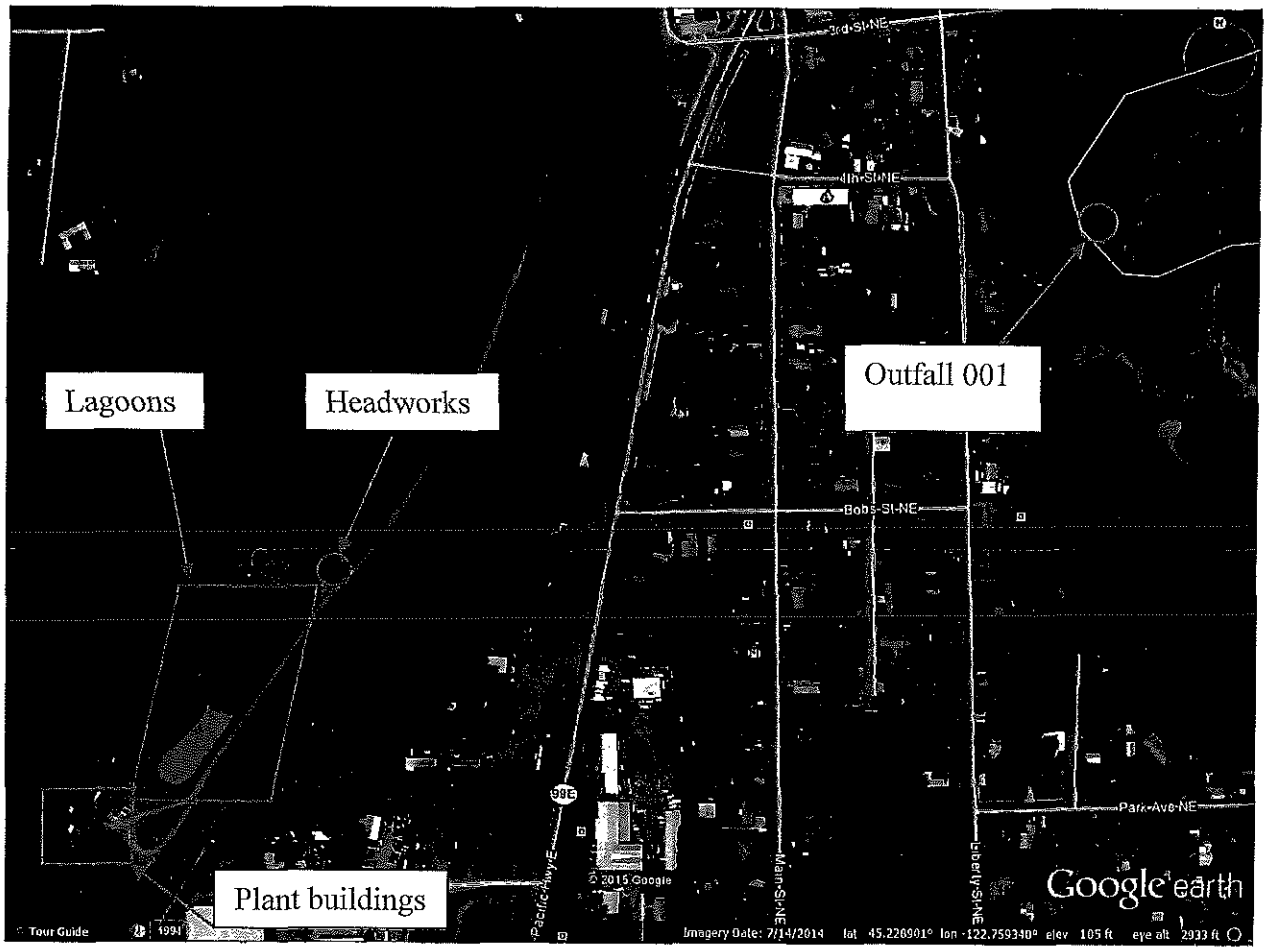


Figure 1: Facility Location

During the summer season from May 1 through October 31, the permittee land applies wastewater on approximately 8 acres of city owned property immediately adjacent to the facility. The facility's average dry weather design flow is 0.087 million gallons a day (MGD).

3.2 *Outfalls*

The current NPDES permit allows the treatment facility to discharge treated effluent through Outfall 001 to the Pudding River at RM 9.2 from November 1 through April 30 each year. The permit prohibits discharge to surface water from May 1 through October 31 each year. The proposed renewal permit will update the outfall location to RM 8.4, as discussed above in section 3.1.

Permit requirements for Outfall 002 requires the permittee to distribute all reclaimed water on land through dissipation by evapotranspiration, following sound irrigation practices so as to prevent:

- Prolonged ponding of treated wastewater on the ground surface;
- Surface runoff or subsurface drainage through drainage tile;
- The creation of odors, fly and mosquito breeding or other nuisance conditions;
- The overloading of land with nutrients, organics, or other pollutant parameters; and,
- Impairment of existing or reasonably probable beneficial uses of groundwater.

Schedule D, condition 3 requires the permittee to comply with the requirements for using reclaimed water under Division 55, and that the permittee must manage all reclaimed water according to a DEQ-approved Recycled Water Use Plan before land applying the wastewater.

3.3 Sewage Collection System

The City of Aurora has a collection system that consists of 20,600 feet of 8-inch diameter gravity sewer main pipe (type 3034), 5,060 feet of 6-inch gravity sewer main pipe (type 3034), 2,950 feet of 6-inch force main pipe (type 3034), and 6,680 feet of 4-inch force main pipe (type 3034). The system's three lift stations are about 15 feet to 20 feet deep, and are equipped with 20 HP Hydromatic submersible pumps, with 1 spare at the facility shop. The 20 foot deep lift station is equipped with two 5 HP Flyte pumps. All lift stations have level controls for operations, and alarms for high and low levels. All lift stations have high temperature and seal alarms. The wastewater treatment plant's SCADA system monitors the levels and alarms.

The ratio of wet weather to dry weather flows measured at the treatment plant is an indication of how much Infiltration and Inflow (I & I) is occurring in the collection system. Table 1 summarizes this information.

Table 1: Average and Peak Flow Statistics for City of Aurora

Flow Statistic	Millions of Gallons/Day (MGD)	Ratio to Average Dry Weather Design Flow (ADWDF)
Average Dry Weather Design Flow (ADWDF)[1]	0.087	1
Average Wet Weather Flow over last 3 years	0.303	3.8
Highest Monthly Average over last 3 years (December 2014)	0.200	2.5
Peak Daily Flow over last 3 years (12/13)	0.108	1.4

1. The average dry weather design flow of 0.087 MGD is from the permittee's renewal application. Facility personnel compiled the flow statistics, using discharge monitoring report data from the last three complete years (2012 – 2014).

The table's statistics indicate that the facility does not exhibit high levels of I & I.

DEQ recognizes that it is not practical to attempt to build and operate treatment plants and collection systems to eliminate any and all bypasses or overflows, and that at some point, attempts to do so represent a poor investment of public funds. Therefore, DEQ is interested in encouraging communities to reduce the rate at which SSOs and bypasses occur. To this end, the permit requires the following:

- The municipality must develop a program to reduce I & I and submit a progress report on an annual basis (see Schedule D, Condition 1).
- The municipality must develop and maintain an emergency response and public notification plan to cover bypass and SSO events (Schedule F, section B.8).

The municipality must report all bypasses and overflows (Schedule F, sections B.3, B.6, respectively).

3.4 Recycled Water

The permit holder currently operates a recycled water use program and plans to continue this operation during the next permit cycle. The permittee submitted a Recycled Water Use Plan (RWUP) to DEQ, and the plan is available for public comment with the proposed permit. The permittee's RWUP allows the facility to land apply their Class B treated wastewater on approximately 8 acres of city-owned property, immediately adjacent to the facility, from May 1st through October 31st of each year.

3.5 Wastewater Solids

The purpose of this section is to describe and document how the facility handles wastewater solids at the treatment plant. The term wastewater solid includes sewage sludge and biosolids. Sewage sludge refers to solids from primary, secondary, or advanced treatment of domestic wastewater that have not been treated or determined to be suitable for land application as fertilizer or soil amendment. The term biosolids refers to domestic wastewater treatment facility solids that have undergone adequate treatment, suitable for land application as a fertilizer or soil amendment.

3.5.1 Storage, Transfer and Disposal of Sewage Sludge

The facility currently has a concrete pad with short concrete walls surrounding three sides. This pad encloses four 3,000 gallon holding tanks. When these tanks are full, facility personnel contract with a licensed hauler to come pump the sludge into a tank truck, and haul it for disposal at the City of Salem's wastewater treatment plant, or other facility permitted to accept such waste.

3.5.2 Land Application

The permit holder does not currently land apply biosolids or produce biosolids for sale or distribution, and does not plan to do so during the renewal permit term.

3.5.3 Other Beneficial Reuse

The permit holder does not currently practice other types of beneficial reuse, such as energy recovery.

3.6 Storm Water

Stormwater is not addressed in this permit. General NPDES permits for stormwater are not required for facilities with a design flow of less than 1 MGD.

3.7 Groundwater

When the facility was constructed, the wastewater lagoon cells were lined with HDPE liners. Facility personnel leak tested each cell to assure that all seams, surfaces and protrusions were water tight. The operator has reported no evidence of lagoon leakage. Accordingly, this facility has little potential for adversely impacting groundwater quality. Schedule A, condition 4 of the proposed permit includes a provision prohibiting any adverse impact on groundwater quality.

3.8 Industrial Pretreatment

The permittee does not have a DEQ-approved industrial pretreatment program. Based on current information, no industrial pretreatment program is needed.

4.0 Receiving Water

4.1 Flows

The flow gage nearest to the city of Aurora's outfall is located next to the bridge over highway 99E in Aurora. This is USGS gage station number 14202000. This gage is currently active, and information from this station dates back to 1928. For the purposes of this evaluation report, DEQ used the last 30 years of flow data, and the EPA program, DFLOW, to compute the statistics in Table 2, below.

Aurora discharges to the Pudding River from November through April. The discharge's impact is likely to be greatest in late summer or early fall when stream flows are typically the lowest of their discharge period. This period is sometimes referred to as the critical period.

The impact of a discharge on the receiving stream is evaluated with respect to the flows likely to occur during the critical period. To standardize this analysis, DEQ makes use of four different flow statistics. Each statistic is designed to work with a different type of water quality impact and associated water quality criteria. Table 2 summarizes these flow statistics and their application. DEQ used flow data from the USGS gage at Aurora (site number 14202000), and the EPA DFLOW program, to calculate the statistics. The period of record is from 1993 through 2014.

Table 2: Summary of Flow Statistics

Streamflow Statistic	What It Is	Potential Impacts[1] Statistic is Used to Analyze	Value for Pudding River (cfs)
1Q10	The lowest one day average flow with a recurrence frequency of once in 10 years.	Acute toxicity to aquatic life	81
7Q10	The lowest seven day average flow with a recurrence frequency of once in 10 years.	Chronic toxicity to aquatic life	111
30Q5	The lowest 30 day average flow with a recurrence frequency of once in 5 years.	Impacts to human health from toxics classified as non-carcinogens	391
Harmonic mean	Long term mean flow value calculated by dividing the number of daily flows by the sum of the reciprocals of those daily flows. The equation is: $\frac{n}{\sum 1/Q_{i-n}}$ where n = number of daily flows and Q = flow	Impacts to human health from toxics classified as carcinogens	126

[1]Impacts are evaluated with respect to pollutants for which DEQ has developed water quality criteria. More information may be found at http://www.deq.state.or.us/wq/standards/toxics.htm#

4.2 Designated Uses

Under the Clean Water Act, DEQ is required to identify the beneficial uses of every waterbody in Oregon. The intent of this requirement is to insure that the water quality standards DEQ develops are consistent with how the waterbody is used. DEQ-issued permits must in turn reflect the water quality standards that apply to the basin in which DEQ issues permits.

The Aurora STP discharges to the Pudding River, for which the following beneficial uses have been identified:

- public and private domestic water supply,
- industrial water supply,
- irrigation and livestock watering,
- fish and aquatic life (including salmonid rearing, migration and spawning),
- wildlife and hunting,
- fishing,
- boating,
- water contact recreation,
- aesthetic quality, and
- hydro power

The water quality standards for the Willamette Basin, developed to protect these beneficial uses, can be found in Oregon Administrative Rules 340-041-0340.

4.3 Receiving Stream Water Quality

In the vicinity of the facility's outfall, the Pudding River is included on the DEQ's 303(d) List as water quality limited for numerous parameters (see Table 3). In December of 2008 DEQ issued a Total Maximum Daily Load (TMDL) addressing these parameters. The TMDL assigned a Waste Load Allocation (WLA) to the Aurora facility for bacteria. The current permit has the following bacteria limits: a monthly logarithmic mean (*E. coli* counts/100 mL) of 126, and a single sample limit (*E. Coli* counts/100 mL) of 406.

Table 3. 303(d) Parameters Applicable at Outfall 001

Parameter	Season – Criteria
DDT	Year Around
Dieldrin	Year Around
E. Coli	Fall/Winter/Spring
Fecal Coliform	Summer
Iron	Year Around
Manganese	Year Around
Temperature	Year Around (Non-spawning) Salmon and trout rearing and migration: 18.0° C

4.4 Mixing Zone Analysis

DEQ-issued permits sometimes specify mixing zones, also known as "regulatory mixing zones" or "allocated impact zones". State and federal regulations allow mixing zones. They are areas in the vicinity of outfalls in which all or some of Oregon's water quality standards can be suspended. DEQ allows mixing zones when the overall impact, evaluated with respect to Oregon's Mixing Zone Rule (OAR 340-041-0053), appears to be negligible.

Two mixing zones can be developed for each discharge: (1) The acute mixing zone, also known as the "zone of initial dilution" (ZID), and (2) the chronic mixing zone, usually referred to as "the mixing zone." The ZID is a small area where acute criteria can be exceeded as long as it does not cause acute toxicity to organisms drifting through it. The mixing zone is an area where acute criteria must be met but chronic criteria can be exceeded. The mixing zone's design must protect the integrity of the entire water body.

On October 13, 2009, the DEQ lab performed the field work for the mixing zone study that they released in May 2010. The allowable mixing zone for the Aurora facility is that portion of the Pudding River, extending from a point ten feet upstream of the outfall, to a point 25 feet from the east bank of the river, and to a point 108 feet downstream from the outfall. The zone of immediate dilution (ZID) is defined as that portion of the allowable mixing zone that is within ten feet of the outfall discharge port. DEQ believes that the discharge and mixing zone do not adversely affect the receiving stream's beneficial uses. DEQ also believes that the defined mixing zone meets the rule criteria.

The facility's discharge flow rate during the study was 0.061 MGD. The outfall was visible below the water's surface. Since the DEQ staff performed conductivity mapping at the outfall, a dye study was not necessary during the survey. The DEQ staff used conductivity to delineate wastewater mixing in the receiving stream. The Pudding River is designated as salmon and trout rearing and migration corridors, based on the ODFW fish habitat maps and Division 41, Water Quality Standards, Figure 340A.

There are public access sites to this portion of the river. Upstream of the outfall is an area used for contact recreation. The outfall is located in a part of the river that is upstream of a bridge over the river. No drinking water intakes are located within ½ mile downstream of the outfall. No other NPDES-permitted discharges are located within ½ mile upstream or downstream of the outfall. The outfall consists of a single port, eight-inch diameter steel pipe. The pipe is horizontal to the stream bottom, and enters the stream at mid channel.

DEQ used the conductivity data measured during the field study to determine the dilutions at the edge of the mixing zone and zone of initial dilution. DEQ then used the EPA-supported mixing zone software, CORMIX, to simulate the discharge during critical flow conditions. The resulting dilutions to be used for permitting purposes are 10 for the ZID, and 134 for the MZ.

5.0 Overview of permit development

5.1 Types of Permit Limits

Effluent limitations serve as the primary mechanism in NPDES permits for controlling pollutant discharges to receiving waters. Effluent limitations can be based on either the technology available to control the pollutants, or limits that protect the water quality standards for the receiving water. These two types of permit limits are referred to as technology-based effluent limitations (TBELs), and water quality-based effluent limits (WQBELs) respectively. When a TBEL is not restrictive enough to protect the receiving stream, a WQBEL must be placed in the permit. More explanation of each is provided below.

- TBELs:
  - The intent of TBELs is to require a minimum level of pollutant treatment, based on available treatment technologies, while allowing the discharger to use any available control technique to meet the limits.
  - TBELs for municipal treatment plants, also known as federal secondary treatment standards, have been developed for the following parameters: biochemical oxygen demand measured over 5 days (BOD_5), total suspended solids (TSS), and pH. These are found in the Code of Federal of Federal Regulations (CFR), and are known as secondary treatment standards. The CFR also allows special considerations and exceptions to these standards for certain circumstances and types of treatment facilities, such as lagoons.
- WQBELs:
  - The intent of WQBELs is to assure the water quality standards of a receiving stream are met. The water quality standards are developed to protect the beneficial uses of the receiving stream, such as swimming and fishing. In many cases TBELs are not restrictive enough to assure the receiving stream meets water quality standards. In these cases, DEQ needs to establish WQBELs to protect the receiving stream.
  - Oregon is unique in that it has minimum design criteria for BOD and TSS that are only applicable to sewage treatment plants. These design criteria vary by watershed basin. DEQ developed them to protect water quality in their respective basins. These are often more stringent than the federal secondary treatment standards. When this is the case, the basin standards supersede the federal standards.

TBELs are likely to be the most stringent if the receiving stream is large relative to the discharge, while WQBELs are likely to be the most stringent when the receiving stream is small or does not meet water quality standards.

In some cases, DEQ will develop both a TBEL and a WQBEL for a particular parameter. Permit writers must include the more stringent of the two in the permit.

Permit limits for bacteria are WQBELs when they are derived from the water quality standards found in OAR 340-041-0009 for freshwater. Bacteria limits are designed to protect human health when swimming or eating shellfish.

When DEQ renews a permit, the permit writer evaluates the existing limits to see if they need to be modified as a result of changes to technology based standards or water quality standards that may have occurred during the permit term. Anti-backsliding provisions (described in CFR 122.44(l)) generally do not allow DEQ to relax effluent limits in renewed/reissued permits. The more stringent of the existing or new limits must be included in the renewal permit.

5.2 Existing Permit Limits

The existing permit limits are as follows:

6. May 1 – October 31: No discharge to waters of the State (unless DEQ approves in writing)

(2) November 1 – April 30:

Parameter	Average Effluent Concentrations		Monthly* Average lb/day	Weekly* Average lb/day	Daily* Maximum lbs
	Monthly	Weekly			
BOD_5	30 mg/L	45 mg/L	30	60	140
TSS	50 mg/L	80 mg/L	47	90	220

* Average dry weather design flow to the facility is 0.087 MGD. DEQ calculated mass load limits based on the maximum flows with a two year recurrence interval and the capability of the treatment works at those flows.

(3)

Other parameters (year-round)	Limitations
E. coli Bacteria	Must not exceed 126 organisms per 100 mL monthly geometric mean. No single sample shall exceed 406 organisms per 100 mL. (See Note 1)
pH	Must not be outside the range of 6.0 – 9.0 S.U.
BOD_5 and TSS Removal Efficiency	Must not be less than 85% monthly average for BOD_5 and 65% monthly for TSS.
Total Residual Chlorine	Must not exceed a monthly average concentration of 0.08 mg/l and a daily maximum concentration of 0.20 mg/l (See Note 2).

Notes:

1. No single *E. coli* sample may exceed 406 organisms per 100 mL; however, DEQ will not cite a violation of this limit if the permittee takes at least 5 consecutive re-samples at 4 hour intervals beginning within 28 hours after the original sample was taken and the geometric mean of the 5 re-samples is less than or equal to 126 *E. coli* organisms/100 mL.
2. When the total residual chlorine limitation is lower than 0.10 mg/L, DEQ will use 0.10 mg/L as the compliance evaluation level (i.e., DEQ will consider daily maximum concentrations below 0.10 mg/L in compliance with the limitation).

5.3 *Recycled Water*

Historically, the treatment facility has produced 10 MG of recycled water annually for use, as summarized in Table 4.

Table 4: Annual Recycled Water Use (2014)

Use and Location	Recycled Water Class	Volume (gallons)
Grass, pasture, hybrid poplar trees	C	10 million

The permit holder maintains a Recycled Water Use Plan that describes how the facility will comply with permit requirements. The RWUP also includes specific locations where recycled water use occurs. DEQ updated the permit holder's RWUP on October 30, 2015. The RWUP is available for public review and comment with the permit.

5.4 *Anti-degradation*

Oregon's Anti-Degradation Policy for Surface Waters, found in OAR 340-041-0004, requires DEQ to demonstrate that the discharge does not lower water quality from existing conditions.

DEQ performed an antidegradation review for this discharge see Appendix E). The proposed permit contains the same discharge loadings as the existing permit. DEQ does not consider permit renewals with the same discharge loadings as the previous permit to lower water quality from the existing condition. DEQ is not aware of any information that existing limits do not protect the designated beneficial uses listed in Section 5.2. DEQ is also not aware of any existing uses present within the waterbody that are not currently protected by standards developed to protect the designated uses. Therefore, DEQ has determined that the proposed discharge complies with DEQ's antidegradation policy.

6.0 Permit Draft Discussion

6.1 *Face Page*

The face page provides information about the permittee, description of the wastewater, outfall locations, receiving stream information, permit approval authority, and a description of permitted activities. The

permit allows discharge to the Pudding River within the Schedule A limits, and the following schedules. It prohibits all other discharges.

In accordance with state and federal law, NPDES permits will be effective for a fixed term not to exceed 5 years. Upon issuance, this permit will be effective for no more than 5 years.

DEQ evaluated the classifications for the treatment and collection systems (see Attachment D). DEQ's evaluation determined that the facility's treatment system is Class 2, and the collection system is Class 1. DEQ is not proposing any changes to the system classifications.

6.2 Permit Limit Derivation

6.2.1 Technology-Based Effluent Limits (TBELs)

TBELs must be met at the outfall. The applicable TBELs for this facility are the most stringent of the federal secondary treatment standards and the Oregon basin standards, adjusted as necessary for the type of treatment system.

Table 5 shows a comparison of the federal secondary treatment standards and Oregon basin standards, and also lists bacteria standards. Basin standards and bacteria standards are not strictly speaking TBELs; however they function as such when they have to be met at the end of the pipe.

Table 5: Comparison of Federal Secondary Treatment and Basin Standards

Parameter	Federal Secondary Treatment Standards		Applicable Willamette Basin Standards (OAR 340-041-0345)
	30-Day Average	7-Day Average	30-Day Average
5-Day BOD	30 mg/L	45 mg/L	10 mg/L BOD & TSS (May 1 – Oct. 31). 30 mg/L BOD (Nov. 1 – Apr. 30).
TSS	30 mg/L	45 mg/L	45 mg/L TSS (Nov. 1 – Apr. 30).
pH	6.0 – 9.0 (instantaneous)		6.5 – 8.5 Note: basin standards for pH do not have to be met at the outfall and can instead be met at the edge of the mixing zone.
% Removal	85% BOD5 and TSS		Not specified.

The above TBELs may be adjusted for particular types of treatment systems and conditions described in 40 CFR Part 133. The adjustments that apply to Aurora are as follows:

- Facilities such as lagoons, trickling filters and waste stabilization ponds. These are often employed in smaller communities, such as Aurora, and though they are capable of achieving significant reductions in BOD and TSS, they may not be able to consistently achieve the secondary treatment standards listed above. Under 40 CFR 133.105, states are allowed to set special BOD and TSS limits for lagoon and trickling filter facilities. The monthly average concentration limits can be as high as 45 mg/L, while weekly average limits can be as high as 65 mg/L. The removal efficiency limits can be as low as 65%.

- There are additional, special considerations for TSS discharges from lagoon facilities (40 CFR 133.103(c). Monthly average concentration limits can be as high as 50 mg/L west of the Cascade Mountains, and 85 mg/L east of the Cascade Mountains.

Table 6 summarizes the TBELs and applicable basin standards for Aurora.

Table 6: Summary of Permit Limits* for Aurora

Effluent Parameter	Concentration		Percent Removal	Comments
	Monthly	Weekly		
BOD_5*	30 mg/L	45 mg/L	85	These are equal to the basin standards.
TSS*	50 mg/L	80 mg/L	65	These are equal to the basin standards, adjusted for the fact that the facility treatment uses lagoons.
pH	Must not be outside the range of 6.0 to 9.0			Basin standards are 6.5 – 8.5. Note: basin standards don't have to be met at the outfall and can instead be met at the edge of the mixing zone.
Bacteria	Must not exceed 126 organisms per 100 ml monthly geometric mean. Any single sample must not exceed 406 organisms per 100 ml.			
Total Residual Chlorine	0.19 mg/L Daily Maximum 0.07 mg/L Monthly Average			When the total residual chlorine limitation is lower than 0.10 mg/L, DEQ will use 0.10 mg/L as the compliance evaluation level (i.e. monthly average concentrations below 0.10 mg/L will be considered in compliance with the limitation).

*The limits for BOD_5 and TSS shown in this table are concentration-based limits.

The average dry weather design flow to the facility is 0.087 MGD. DEQ calculated the winter mass load limits for the facility, based on the maximum flows with a two-year recurrence, and the capability of the treatment works at those flows per OAR 340-041-061(9)(b). The facility's equipment pumps effluent to the Pudding River, using a constant speed pump at 300 gallons per minute (gpm), or 0.432 MGD. Therefore, the flow rate for a daily maximum discharge is 0.432 MGD. The weekly average discharge flow with a two year recurrence is 0.180 MGD, and the highest monthly average winter discharge flow with a two year recurrence is 0.142 MGD.

BST, Inc., the city's consultant, determined that the facility can reasonably achieve 40 mg/L BOD_5 and 60 mg/L TSS on a daily maximum, 40 mg/L BOD_5 and 60 mg/L TSS on a weekly average, and 25 mg/L BOD_5 and 40 mg/L TSS on a monthly average.

DEQ uses the following equation to develop mass loads:

- Mass Load = Design flow (MGD) x Concentration-based limit (mg/L) x Conversion factor (lbs/gal).

The weekly average and maximum daily mass loads are equal to the monthly average, times 1.5 and 2 respectively.

The facility's winter mass limits calculations for BOD5 are as follows:

- 0.142 MGD x 25 mg/L monthly average x 8.34 lbs/gal = 29.6 lbs/day rounded off to 30 lbs/day.
- 0.180 MGD x 40 mg/L weekly average x 8.34 lbs/gal = 60 lbs/day.
- 0.432 MGD x 40 mg/L daily maximum x 8.34 lbs/gal = 144 lbs/day rounded off to 140 lbs/day.

The facility's winter mass limits calculations for TSS are as follows:

- 0.142 MGD x 40 mg/L monthly average x 8.34 lbs/gal = 47.3 lbs/day rounded off to 47 lbs/day.
- 0.180 MGD x 60 mg/L weekly average x 8.34 lbs/gal = 90 lbs/day.
- 0.432 MGD x 60 mg/L daily maximum x 8.34 lbs/gal = 216 lbs/day rounded off to 220 lbs/day.

DEQ rounds all mass load limitations to two significant figures. This is consistent with the number of significant figures associated with the facility's flow measurements, and with the accuracy of BOD measurements of 10 or greater.

6.2.2 Water Quality-Based Effluent Limits

After DEQ establishes TBELs and applicable basin standards for the facility, DEQ then develops WQBELs.

In August 1993, DEQ established a TMDL to bring the river into compliance with the dissolved oxygen standard. The TMDL contains a WLA for the summer discharge season; however, the Aurora facility only discharges during the winter season and therefore does not have a WLA for any these pollutants in their permit.

6.2.2.1 General Discussion of Reasonable Potential Analysis

EPA has developed a methodology called Reasonable Potential Analysis (RPA) for determining if there is a reasonable potential for a discharge to cause or contribute to violations of water quality standards for a particular parameter. RPA accounts for effluent variability, available dilution (if applicable), receiving stream water quality, and water quality standards to protect aquatic life and human health. If the RPA results indicate that there is a potential for the discharge to cause or contribute to exceedances of water quality standards, then the methodology establishes permit limits that will not cause or contribute to violations of water quality standards.

DEQ has adopted EPA's methodology for RPA, and has developed spreadsheets that incorporate this analysis.

The parameters for which a RPA must be performed will vary with the size and type of discharge. The NPDES Permit Testing Requirements for Publicly Owned Treatment Works, contained in Appendix J of 40 CFR Part 122, lists these parameters. Table 7 summarizes the relevant section for the Aurora facility.

Table 7: Testing Requirements for Publicly-Owned Treatment Works

Pollutant List	Parameters for which RPA Needed
Table 1A – Effluent Parameters for All POTWs	pH, Temperature

The following sections discuss the parameters of concern for the Aurora facility, including the RPA results for each of these parameters.

6.2.2.2 Reasonable Potential Analysis for pH

The pH of water is a measure of how acidic or basic a solution is. At a pH of 7.0, the solution is considered neutral. Most aquatic organisms can tolerate only a narrow range around 7.0.

As indicated in the section 6.2.1, the applicable basin standard for Aurora's discharge to the Pudding River is 6.5 to 8.5. Aurora's current pH limits assure that the standard is met at the edge of the mixing zone. The proposed limits are the same as the existing limits (6.0 to 9.0 S.U.). See Appendix B for the pH RPA worksheet.

6.2.2.3 Reasonable Potential Analysis for Temperature

Water temperatures affect the life cycles of aquatic species and are a critical factor in maintaining and restoring healthy salmonid populations. The purpose of the temperature criteria in OAR 340-041-0028 is to protect designated, temperature-sensitive beneficial uses (including salmonid life cycle stages) from adverse anthropogenic warming activities.

On December 31, 2008, EPA approved the TMDL for the Pudding River. Because the facility does not discharge during the critical summer months, the TMDL did not assign a temperature waste load allocation to the facility.

DEQ reviewed the facility's effluent temperature data over the last two years. This review showed that during the discharge season (November 1 – April 30), the facility's maximum discharge temperature was less than 21.0°C. Therefore a thermal plume analysis is not required.

Based on the fish use maps, the receiving stream in the vicinity of the facility's outfall is not spawning habitat. Since the facility discharges only in the winter months (November 1st through April 30th), DEQ completed the Winter, No Spawning, RPA worksheet, to run the temperature RPA applicable to the facility. For the ambient temperature value of the receiving stream portion of the worksheet, DEQ used the maximum of the values over the last two years that DEQ collected at its ambient site from the bridge over the Pudding River in Aurora, during the discharge season. For the effluent flow rate portion of the worksheet, DEQ used the facility's ADWF value. This is a conservative approach since the actual dry weather flows are significantly lower than the design flow rate. The results of the RPA worksheet show that the facility has no reasonable potential to adversely affect the receiving stream's temperature (see Appendix C).

6.2.2.4 Reasonable Potential Analysis for Chlorine

DEQ used the fresh water criteria for chlorine to calculate permit limits. According to OAR 340-041, Table 33A, chlorine concentrations of 11 µg/L can result in chronic toxicity in fresh water, while 19 µg/L can result in acute chlorine toxicity in fresh water. DEQ requires compliance with acute toxicity criteria at the edge of the ZID, and compliance with chronic toxicity criteria at the edge of the MZ.

DEQ re-calculated the chlorine limits for the facility, based on the most recent two years' worth of data from the facility's DMRs. The results of the re-calculation show that the limits have changed very

slightly. The current limits are 0.08 mg/L (monthly average), and 0.20 mg/L (daily maximum). The new limits are 0.07 mg/L (monthly average), and 0.19 mg/L (daily maximum, see Appendix D).

6.3 *Schedule A. Waste Discharge Limits*

The proposed permit limits for Aurora are included in Schedule A of the permit. The numeric limits in Schedule A are reproduced below. These limits are the result of the analyses described in Section 6.2.1. Schedule A of the permit also contains conditions relating to recycled water and chlorine.

Schedule A – Waste Discharge Limits

The proposed effluent limits for Outfall 001 are as follows:

1. **Outfall 001 - Treated Effluent**
   a. BOD_5,and TSS
      i. May 1 – October 31: No discharge to waters of the state (unless DEQ gives written approval to do so).

      ii. November 1 – April 30: During this time period the permittee must comply with the limits in the following table:

Table A1: BOD_5 and TSS Limits

Parameter	Average Effluent Concentrations, mg/L		Monthly Average lbs/day	Weekly Average lbs/day	Daily Maximum Lbs
	Monthly	Weekly			
BOD_5	30 mg/L	45 mg/L	30	60	140
TSS	50 mg/L	80 mg/L	47	90	220

   b. Additional Parameters. The permittee must comply with the limits in the following table (year round except as noted):

Table A2: Limits for Additional Parameters

Year-round (except as noted)	Limits
BOD_5 and TSS Removal Efficiency	Must not be less than 85% monthly average for BOD_5 and 65% monthly for TSS.
E. coli Bacteria (see Note a.)	Monthly log mean must not exceed 126 organisms per 100 ml. Any single sample must not exceed 406 organisms per 100 ml.
pH	Must not be outside the range of 6.0 to 9.0 S.U.
Total Residual Chlorine	Monthly average concentration must not exceed 0.07 mg/L. Daily maximum concentration must not exceed 0.19 mg/L
Notes a. Any single *E. coli* sample must not exceed 406 organisms per 100 mL; however, DEQ	

Year-round (except as noted)	Limits
will not cite a violation of this limit if the permittee takes at least 5 consecutive re-samples at 4 hour intervals, beginning within 28 hours after the original sample was taken, and the log mean of the 5 re-samples is ≤ 126 *E. coli* organisms/100 mL.	

6.3.1 Discussion of Permit Limits in Tables A1 and A2

The limits in Tables A1 and A2 are discussed in detail below, in the following order:

a. BOD_5, TSS, Mass Load and Percent Removal Efficiency
b. Bacteria
c. pH
d. Total Residual Chlorine

a. BOD_5 and TSS Concentration, Mass Load and Percent Removal Limits
BOD_5 and TSS are effluent "strength" indicators. Section 6.2.1 describes the development of concentration and mass limits for BOD_5 and TSS. These indicators are TBELs. The permit requires a removal efficiency of 85% for BOD, and 65% for TSS. Section 6.2.1 describes the derivation of this removal efficiency, and is consistent with the Code of Federal Regulations (40 CFR part 133.105) when there is a trickling filter or lagoon system.

b. Bacteria
Federal and state rules consider bacteria limits WQBELs. Since Aurora discharges to freshwater , the proposed permit limits are based on the *E. coli* standard contained in OAR 340-041-0009(5). The proposed limits are a monthly geometric mean of 126 *E. coli* per 100 mL, with no single sample exceeding 406 E. coli per 100 mL. If a single sample exceeds 406 *E. coli* per 100 mL, then the permittee must take five consecutive re-samples. If the log mean of the five re-samples is less than or equal to 126, a violation is not triggered. The permittee must conduct the re-sampling at four hour intervals, beginning within 28 hours after the permittee collected the original sample.

c. pH
Section 6.2.1 describes the derivation of pH limits. DEQ developed these limits with respect to the basin standards, adjusted for dilution at edge of the mixing zone, and are therefore WQBELs. Appendix B shows that the facility has no reasonable potential to adversely affect the receiving stream's pH criterion.

d. Total Residual Chlorine
Aurora uses chlorine to disinfect the effluent before discharging to the Pudding River. While chlorine is an effective disinfectant, it is toxic to many aquatic organisms. To assure that the potential for toxicity is minimized, Aurora uses dechlorination equipment to reduce the presence of chlorine in the discharge. The current permit contains a chlorine discharge limit, where it is referred to as Total Residual Chlorine.

DEQ performed a chlorine RPA analysis for the current permit cycle. This analysis established total residual chlorine discharge limits of 0.08 mg/L as a monthly average, and 0.20 mg/L as a daily

maximum. DEQ recently re-calculated the chlorine limits for the facility, based on the most recent two years' worth of data from the facility's DMRs. The results of the re-calculation show that the limits have changed very slightly. The new limits are 0.07 mg/L (monthly average), and 0.19 mg/L (daily maximum, see Appendix D).

6.3.2 Discussion of Other Schedule A Requirements

In addition to permit limits for specific parameters, Schedule A also contains requirements pertaining to the use of recycled water, and chlorine usage. These are discussed in more detail below, in the following order:

a. Reclaimed Wastewater Outfall 002
b. Total Residual Chlorine

a. Reclaimed Wastewater Outfall 002
November 1 – April 30: The permit prohibits land application, unless DEQ gives written approval.

b. Total Residual Chlorine
When the total residual chlorine limitation is lower than 0.10 mg/l, DEQ will use 0.10 mg/l as the compliance evaluation concentration (i.e. DEQ will consider monthly average concentrations below 0.10 mg/l to comply with the limitations).

6.4 Schedule B - Minimum Monitoring and Reporting Requirements

Section 1 of Schedule B describes monitoring and reporting protocols for the permit and includes the following:

- Quality Assurance and Quality Control (QA/QC)
- Re-analysis and Re-sampling if QA/QC Requirements Not Met
- Reporting Procedures, including the following:
  - The correct use of significant figures.
  - Reporting detection levels and quantitation limits.
  - Calculating and reporting mass loads.

Schedule B also describes the minimum monitoring and reporting necessary to demonstrate compliance with permit conditions. ORS 468.065(5) requires permittees to perform periodic reporting. Self-monitoring requirements are the primary means of assuring that the permittee meets permit limits. The permittee may also need to monitor other parameters when insufficient data exist to establish a limit, but where there is a potential for a water quality concern.

DEQ has developed monitoring and reporting matrices that establish monitoring and reporting frequencies, based on the facility's size and complexity. The following links direct the reader to these matrices:

http://www.deq.state.or.us/wq/wqpermit/docs/TemplateGuidance/MonMatrix.pdf
http://www.deq.state.or.us/wq/wqpermit/docs/ReportingMatrix.pdf

DEQ used these matrices to establish the facility's monitoring and reporting requirements.

The following tables summarize the various monitoring requirements:

- Table B1: Influent Monitoring
- Table B2: Effluent Monitoring
- Table B3: Recycled Water Monitoring
- Table B4: Effluent Monitoring Required for NPDES Permit Application
- Table B5: Reporting Requirements and Due Dates

Each of these tables is discussed in more detail below.

Tables B1 and B2: Influent and Effluent Monitoring
These tables specify the parameters the permittee must monitor on a regular basis in the influent and effluent, along with associated monitoring frequencies, sample types and related reporting requirements.

Table B1: Influent Monitoring

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
Total Flow (MGD)	Year-round	Daily	Measurement	Daily values
Flow Meter Calibration	Year-round	Annual	Verification (see Note a)	Annual Certification
BOD_5 and TSS (mg/L)	Year-round	1 per two weeks	24-hr composite	Daily values
pH (S.U.)	Year-round	2 per week	Grab	Daily values

Table B2: Effluent Monitoring, Outfall 001

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
Total Flow (MGD)	Year-round	Daily	Measurement	Daily values
BOD_5 and TSS (mg/L)	Nov.–Apr.	1 per two weeks	Composite	Daily values Monthly average
BOD_5 and TSS Mass Load (lb/day)	Nov.–Apr.	1 per two weeks	Calculation	Daily values Monthly average Max. Daily values
BOD_5 and TSS Percent Removal	Nov.-Apr.	Monthly	Calculation	Monthly average
pH (S.U.)	Nov.-Apr.	2 per week	Grab	Daily values Max. Daily values Min. Daily values
Temperature (°C)	Nov.–May	2 per week	Grab	Max. Daily values
E. coli (#/100 mL)	Nov.–May	1 per two weeks	Grab	Daily values
Chlorine Used (lbs/day)	Year-round	Daily	Grab	Daily values
Chlorine, Total Residual (mg/L)	Year-round	Daily	Grab	Daily values
Storage Lagoon Depth	Year-round	Daily	Record	Daily values

Table B3: Recycled Water Monitoring Requirements
OAR 340-055-0012 requires the permittee to monitor and demonstrate compliance with the treatment criteria for a specific Class of recycled water. Table B3 lists the monitoring requirements consistent with OAR 340-055-0012. The RWUP describes specific monitoring and sampling procedures.

Table B3: Recycled Water Monitoring

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
Quantity Irrigated (inches/acre)	May 1-Oct. 31	Daily	Measurement	Daily values
Flow Meter Calibration	Year-round	Annually	Verification	Certification
Quantity Chlorine Used (lbs)	Year-round	Daily	Grab	Daily values
Chlorine, Total Residual (mg/L)	Year-round	Daily	Grab	Daily values
pH	May-Oct.	2/Week	Grab	Daily values
Total coliform	May-Oct.	Weekly	Grab	Weekly values
Nutrients (TKN, NO_2+NO_3-N, NH_3, Total Phosphorus)	May-Oct.	Quarterly	Grab	Quarterly values

Table B4: Effluent Monitoring Required for NPDES Permit Application
The renewal application for this permit requires three scans for the parameters listed in Table B4. The permittee may collect this data 4.5 years before submitting the renewal application. DEQ recognizes that it may be difficult for some facilities to collect three scans that represent the seasonal variation in the discharge from each outfall within the permit renewal timeframe. DEQ therefore requires that the permittee complete this monitoring as part of permit compliance.

Table B4: Effluent Monitoring Required for NPDES Permit Application

(a minimum of 3 scans required)

Parameter
Ammonia (as N)
Dissolved Oxygen
Total Kjeldahl Nitrogen (TKN)
Nitrate Plus Nitrite Nitrogen
Oil and Grease

Table B5: Reporting Requirements and Due Dates
For the convenience of the permit holder, this table summarizes the information contained in the previously-listed tables.

Table B5: Reporting Requirements and Due Dates

Reporting Requirement	Frequency	Due Date (see note a.)	Report Form (unless otherwise specified in writing)	Submit To:
1. Table B1: Influent Monitoring 2. Table B2: Effluent Monitoring	Monthly	15th day of the month following data collection	DEQ-approved discharge monitoring report (DMR) form, electronic and hardcopy. (See Notes b. and c.)	DEQ Regional Office
1. Recycled water annual report describing effectiveness of recycled water system in complying with the DEQ-approved recycled water use plan, OAR 340-055, and this permit. See Schedule D for more detail. 2. Table B3: Recycled Water Monitoring	Annually	January 15	2 hard copies, electronic copy	One each to: • DEQ Regional Office • DEQ Water Reuse Program Coordinator
Wastewater solids annual report describing quality, quantity, and use or disposal of wastewater solids generated at the facility.	Annually	February 19	2 hard copies, electronic hardcopy	One each to: • DEQ Regional Office • DEQ Biosolids Program Coordinator
Inflow and infiltration report (see Schedule D, Section 1	Annually	February 1	1 hard copy, electronic copy	DEQ Regional Office
Significant Industrial User Survey	Every 5 years		1 hard copy, electronic copy	DEQ Regional Office
Outfall Inspection Report	Every 5 years	3rd year of permit term	1 hard copy, electronic copy	DEQ Regional Office

Reporting Requirement	Frequency	Due Date (see note a.)	Report Form (unless otherwise specified in writing)	Submit To:
Notes: a. For submittals that are provided to DEQ by mail, the postmarked date must not be later than the due date. b. Name, certificate classification, and grade level of each responsible principal operator as well as identification of each system classification must be included on DMRs. Font size must not be less than 10 pt. c. Equipment breakdowns and bypass events must be noted on DMRs.				

6.5 Schedule C - Compliance Schedules and Conditions

During the current permit cycle the permittee met all Schedule C compliance schedule requirements. Therefore, the proposed renewal permit has no Schedule C requirements.

6.6 Schedule D - Special Conditions

6.6.1 Inflow and Infiltration

As described in Section 3.3 (sewage collection system), it is important for the permit holder to assess and take steps to reduce the rate of inflow and infiltration of stormwater and groundwater into the sewer system. Consistent with this, Schedule D of the permit requires the permit holder to undertake activities to track and reduce Inflow and Infiltration in the sewer system.

6.6.2 Emergency Response and Public Notification Plan

Schedule F (General Conditions), Condition B.8. requires municipal wastewater treatment facilities to have an Emergency Response and Public Notification Plan.

6.6.3 Recycled Water Use Plan

Schedule D contains conditions requiring the permit holder to develop and maintain a Recycled Water Use Plan. The RWUP must meet the requirements in OAR 340-055-0025 and include location-specific information describing where and how the permittee manages recycled water to protect public health and the environment. The permittee last updated the RWUP on October 30, 2015. The permittee's RWUP sites are registered with the Oregon Water Resources Department. The RWUP also addresses comments from the Oregon Health Authority's review.

6.6.4 Exempt Wastewater Reuse at the Treatment System

Schedule D exempts the permit holder from the recycled water requirements in OAR 340-055, when facility personnel use recycled water for landscape irrigation at the treatment facility, or for in-plant processes, such as in-plant maintenance activities. Landscape irrigation includes water applied to small-

scale irrigation such as supplying supplemental irrigation to turf grass, shrubs, and ornamental trees. Landscape irrigation may include irrigating native vegetation along dikes, banks, and earthen impounds around wastewater lagoons - especially as needed to reduce erosion and maintain structural integrity. Landscape irrigation does not include large-scale irrigation of pasture, hayfields, or native vegetation adjacent to the wastewater treatment facility (i.e., these activities are subject to OAR 340-055 and require facility personnel to develop a RWUP). All of the conditions listed in (6)(i) through (6)(iv), of the permit's Schedule D must be satisfied for an exempt use to be valid.

6.6.5 Wastewater Solids Transfers

The permit allows the facility to transfer treated or untreated wastewater solids to other in-state or out-of-state facilities that are permitted to accept the wastewater solids. The permittee is required to monitor, report, and dispose of solids according to the receiving facility's permit requirements. Wastewater solids that the permittee transfers out-of-state must meet all of the disposal or wastewater use requirements of both Oregon and the receiving state.

6.6.6 Operator Certification

State and federal rules require the permit holder to have an operator whose certifications are consistent with the size and type of treatment plant. The language in this section of the permit describes the requirements relating to operator certification. Appendix F is an updated copy of the Operator Certification Classification Worksheet for the facility.

6.6.7 Industrial User Survey

DEQ requires the permittee to conduct an industrial user survey every five years. The purpose of the survey is to identify whether there are any categorical industrial users discharging to the POTW, and to assure regulatory oversight of these discharges to state waters.

6.7 Schedule E - Pretreatment

The permittee does not have a DEQ-approved industrial pretreatment program. Based on current information, the permittee does not need an industrial pretreatment program.

6.8 Schedule F - NPDES General Conditions

These conditions are standard to all domestic NPDES permits and include language regarding operation and maintenance of facilities, monitoring and record keeping, and reporting requirements. In August 2009 DEQ substantially revised the General Conditions for all individual permits that DEQ issues. DEQ has made minor modifications since then. The following summarizes these changes:

- There are additional citations to the federal Clean Water Act and CFR, including references to standards for sewage sludge use or disposal.
- There is additional language regarding federal penalties.
- Bypass language has been made consistent with the Code of Federal Regulations and with other EPA Region 10 states.
- Reporting requirements regarding overflows are more explicit.

- Requirements regarding emergency response and public notification plans are more explicit.
- Language pertaining to duty to provide information is more explicit.
- Confidentiality of information is addressed.

7.0 Next Steps

7.1 Public Comment Period

DEQ will make the proposed NPDES permit available for public comment for 35 days. DEQ will post public notice and links to the proposed permit on DEQ's website, and send to subscribers to DEQ's pertinent public notice e-mail lists. DEQ will schedule a public hearing if 10 or more people request one, or if an authorized person representing an organization of at least 10 people requests one. If DEQ holds a public hearing, then DEQ will publish an additional public notice advertisement.

7.2 Response to Comments

DEQ will respond to comments received during the comment period. All those providing comments will receive a copy of DEQ's responses. Interested parties may also request a copy of DEQ's responses. After DEQ receives and evaluates the comments, DEQ will decide whether to issue the permit as proposed, make changes to the permit, or deny the permit. DEQ will notify the permittee of DEQ's decision.

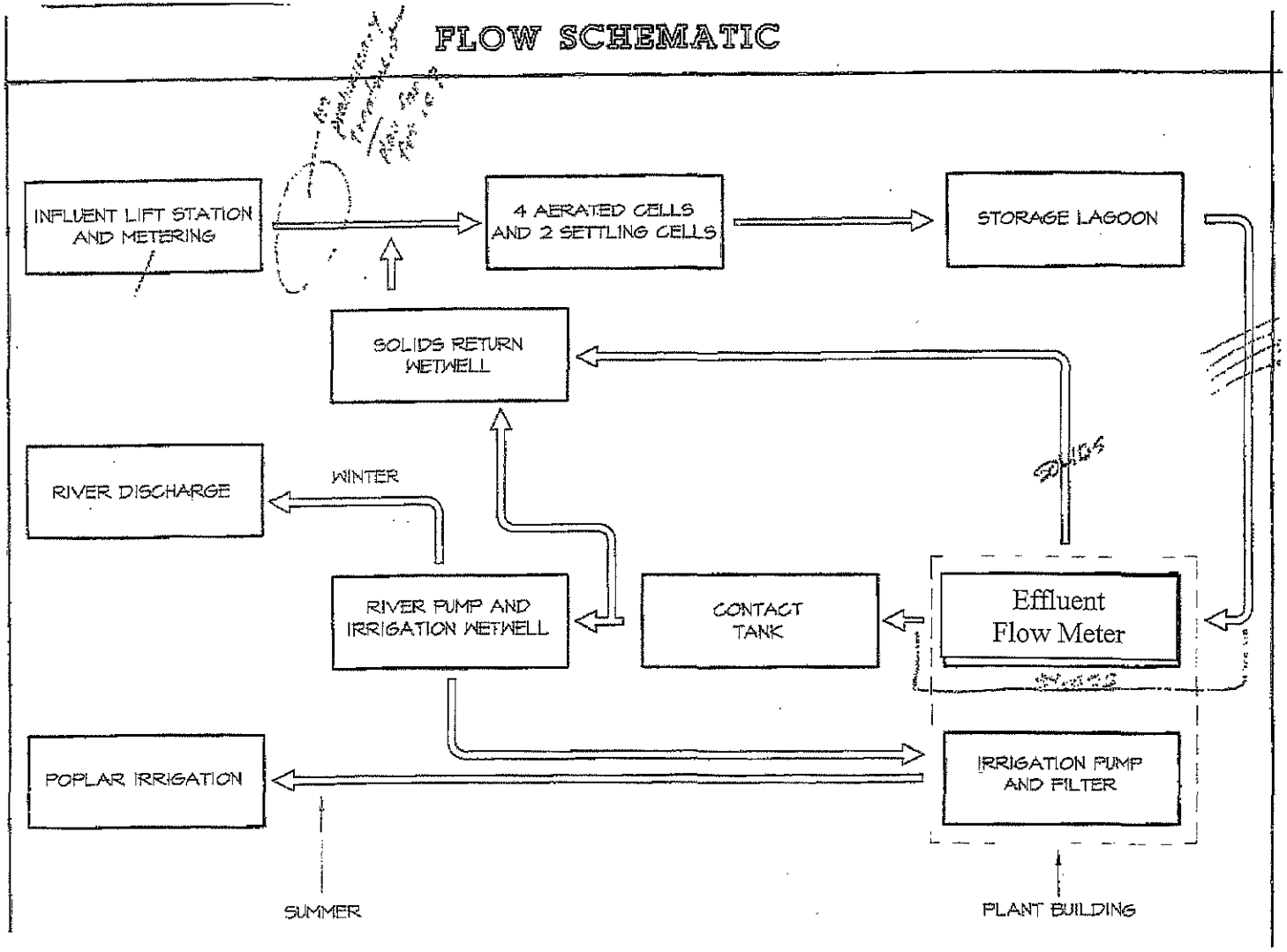
7.3 Modifications to Permit Evaluation Report and Fact Sheet

Depending on the nature of the comments and any changes made to the permit as result of comments, DEQ may modify this permit evaluation report. DEQ may also choose to update the permit evaluation report through memorandum or addendum. If DEQ makes substantive changes to the permit, then an additional round of public comment may occur.

7.4 Issuance

The DEQ mails the finalized, signed permit to the permittee. The permit is effective 20 days from the mailing date.

APPENDIX A: Wastewater Treatment Flow Diagram



APPENDIX B: Reasonable Potential Analysis for pH

	RPA for pH	
INPUT	Lower pH Criteria	Upper pH Criteria
1. DILUTION FACTOR AT MZ BOUNDARY - (Qe+Qr)/Qe	134	134
2. UPSTREAM/BACKGROUND CHARACTERISTICS		
Temperature (deg C):	22.8	22.8
pH:	7.3	7.9
Alkalinity (mg CaCO3/L):	21.0	21.0
3. EFFLUENT CHARACTERISTICS		
Temperature (deg C):	21.3	21.3
pH:	6.0	9.0
Alkalinity (mg CaCO3/L):	191.0	191.0
4. APPLICABLE PH CRITERIA	6.5	8.5
OUTPUT		
1. IONIZATION CONSTANTS		
Upstream/Background pKa:	6.36	6.36
Effluent pKa:	6.37	6.37
2. IONIZATION FRACTIONS		
Upstream/Background Ionization Fraction:	0.90	0.97
Effluent Ionization Fraction:	0.30	1.00
3. TOTAL INORGANIC CARBON		
Upstream/Background Total Inorganic Carbon (mg CaC	23.43	21.61
Effluent Total Inorganic Carbon (mg CaCO3/L):	641.96	191.45
4. CONDITIONS AT MIXING ZONE BOUNDARY		
Temperature (deg C):	22.79	22.79
Alkalinity (mg CaCO3/L):	22.27	22.27
Total Inorganic Carbon (mg CaCO3/L):	28.05	22.88
pKa:	6.36	6.36
pH at Mixing Zone Boundary:	**6.9**	**7.9**
Is there Reasonable Potential?	**No**	**No**

APPENDIX C: TEMPERATURE WORKSHEET

Meets Criteria, Winter, No Spawning
Analysis at Edge of Mixing Zone

Facility Name: Aurora **Date:** 2/3/2016

Enter data into white cells below:

Mixing Zone Dilution =	**134**	
Ambient Temperature =	**12.3**	°C
Effluent Temperature =	**16.5**	°C
Applicable Temperature Criterion =	**18**	°C
Effluent Flow =	**0.087**	mgd

Allowable increase = 5.70 °C

ΔT at MZ edge=	**0.03**	**°C**	**No Reasonable Potential**

Thermal Load Limit =	**N/A**	**Million Kcals**

Equation used to calculate ΔT at edge of MZ

$$\Delta T_{mz} = \frac{T_e + (S-1)T_a}{S} - T_a$$

Equation used to calculate thermal load limit

$$TLL = 3.7854 Q_e S \Delta T_{all} C_p \rho$$

Where:

Qe = Effluent Flow in mgd
S = Dilution
ΔT_{all} = Allowable temperature increase at edge of MZ (°C)
Cp = Specific Heat of Water (1 cal/g °C)
ρ = Density of Water (1 g/cm^3)
3785.41 = Flow conversion from mgd to m^3/day

APPENDIX D: CHLORINE LIMITS CALCULATION WORKSHEET

Facility Name: Aurora STP **Date:** 12/15/2015

Dilution Values? (Y/N)	y	calculated
Rearing Dilution @ ZID (1Q10)	10	*
Rearing Dilution @ MZ (7Q10)	134	*
pawning Dilution @ ZID (1Q10)	*	*
Spawning Dilution @ MZ (7Q10)	*	*
If no dilution values		
Enter flow rates here	Summer	Winter
Effluent Flow (MGD)	*	*
1Q10 (CFS)	*	*
7Q10 (CFS)	*	*
% dilution at MZ	*	*
% dilution at ZID	*	*
probability basis	99%	
(WLA multipliers)		

Rearing data	Effluent	Stream	Mixed ZID 1Q10	Mixed MZ 7Q10		
pH * =	7	7	7.0	7.0		(6.5-9)
Temp * =	22	22	22.0	22.0		° C
Alkalinity =	75	25				
Salmonids Present? (Y/N)	n/a	y				
Salmonid Spawning? (Y/N)	n/a	N				
Fresh Water ? (Y/N)	n/a	y				
Salinity	*	*	*	*		
Spawning data						
pH * =	*	*	*	*		(6.5-9)
Temp * =	*	*	*	*		° C
Alkalinity =	*	*				
Salmonids Present? (Y/N)	n/a	Y				
Salmonid Sapwning (Y/N)	n/a	Y				
Fresh Water ? (Y/N)	n/a	*				
Salinity	*	*	*	*		

	WATER QUALITY CRITERIA			Allocations										Concentration Limits		Mass	
PARAMETER	1 Hour (CMC) mg/l	4 Day (CCC) mg/l	30 Day (CCC) mg/l	Back-ground mg/l	Acute mg/l	4 Day mg/l	30 Day mg/L	CV	# Samples /Mo	Acute LTA mg/l	4 day LTA mg/l	30 day LTA mg/L	Min LTA mg/l	95% Monthly mg/l	99% Daily mg/l		
Rearing Season																	
CHLORINE	0.019	0.011	n/a	0.00	0.19	1.47	n/a	0.7	30	0.05	0.71	n/a	0.05	**0.07**	**0.19**		

NOTES :	Temperature must be between 0 and 30 ° C
	pH must be between 6.5 and 9
	Ammonia is mg/l ammonia as N.

APPENDIX E: ANTIDEGRADATION REVIEW SHEET

Applicant: City of Aurora.

1. What is the name of the surface water that receives the discharge? North Fork of Deep Creek.
Briefly describe the proposed activity: Domestic sewage treatment.
This review is for a: ☐ Renewal ☐ New
Go to Step 2.

2. Are there any existing uses associated with the water body that are not included in the list of designated uses? Example: DEQ's Fish Use Designation Maps identify the waterbody as supporting salmonid migration; however ODFW has determined that it also supports salmonid spawning.
☐ Yes. Identify additional use(s), the basis for conclusion, and the applicable criteria: Go to Step 3.
☐ No. Go to Step 3.

3.Was the analysis of the impact of the proposed activity performed relative to criteria applicable to the most sensitive beneficial use?
☐ Yes. Go to Step 4.
☐ No. Re-do analysis to develop permit limits using correct criteria, and modify permit as necessary. Go to Step 4.

4.Is this surface water an **Outstanding Resource Water** or **upstream** from an **Outstanding Resource Water**? Note: No waters in Oregon have been designated as Outstanding Resource Waters. OAR 340-041-0004(8)(a) contains criteria for designating such waters. Example: they are found in State or National parks.
☐ Yes. Go to Step 7. ☐ No. Go to Step 5.

5.Is this surface water a **High Quality Water**? A High Quality Water is one for which none of the pollutants are Water Quality Limited. To determine, go to the database at http://www.deq.state.or.us/wq/assessment/rpt2010/search.asp and under Listing Status, select "Water Quality Limited – All (Categories 4 and 5)".
☐ Yes. Go to Step 10. ☐ No. Go to Step 6.

6.Is this surface water a **Water Quality Limited Water**? To determine, use the same database query as Step 5.
☐ Yes. Go to Step 16. ☐ No. Go to Step 4 (you must answer "yes" to either question 4, 5, or 6)
Note: The surface water must fall into one of 3 categories: Outstanding Resource Water (Step 4), High Quality Water (Step 5), or Water Quality Limited Water (Step 6).

16.Will the proposed activity result in a lowering water quality in the **Water Quality Limited Water**? [see OAR 340-041-0004(3)-(5) for a description in rule of discharges that do not result in lowering of water quality or do not constitute a new and/or increased discharge or are otherwise exempt from anti-degradation review; otherwise see "Is an Activity Likely to Lower Water Quality?" in *Anti-degradation Policy Implementation Internal Management Directive for NPDES Permits and Section 401 Water Quality Certifications.*]
☐ Yes, go to Step 17.
☐ No, proceed with Permit Application. Permit writer should provide basis for determination in permit evaluation report: Go to Step 23.
23.The basis for conclusion should include a discussion of whether the lowering of water quality is necessary and important. "Necessary" means that the same social and economic benefits cannot be achieved with some

other approach. "Important" means that the value of the social and economic benefits due to lowering water quality is greater than the environmental costs of lowering water quality.
Benefits can be created from measures such as:

- Creating or expanding employment (provide current/expected number of employees, type & relative amount of each type.
- Increasing median family income.
- Increasing community tax base (provide current/expected annual sales, tax info).
- Providing necessary social services.
- Enhancing environmental attributes.

Environmental Costs can include:

- Losing assimilative capacity otherwise used for other industries/development.
- Impacting fishing, recreation, and tourism industries negatively.
- Impacting health protection negatively.
- Impacting societal value for environmental quality negatively.

On the basis of the Anti-degradation Review, DEQ recommends the following:
☐ Proceed with Application to Interagency Coordination and Public Comment Phase.
☐ Deny Application; return to applicant and provide public notice.

Action Approved
Review prepared by ☐ DEQ, go to DEQ info ☐ Other, go to Other info

DEQ info
Name: David Cole
Phone: 503-229-5011
Date Prepared: June 19, 2015
Please provide the following information and submit with the completed application form to:
Department of Environmental Quality
Water Quality Division—Surface Water Management
811 SW Sixth Avenue
Portland, Oregon 97204-1390

Name: Darrel Lockard, Wastewater Treatment Plant Operator
Name of Company: City of Aurora
Address: 21420 Main Street, Aurora, Oregon, 97002
Phone: 503-222-9997
Email: bmcm5@aol.com
Date prepared: September 8, 2015

APPENDIX F: Operator Certification Classification Worksheet

Oregon Department of Environmental Quality

Wastewater System Classification Worksheet for Operator Certification

STEP 1: Criteria for Classifying Wastewater Treatment Systems (OAR 340-049-0025)					
Wastewater System Common Name:	City of Aurora				
Location:	21494 Mill Race Rd			Region:	Western
County:	Marion			Date:	2/17/2015
Facility ID:	110020			Classified by:	David Cole
Design ADWF (Influent MDG):		0.087		WWC Class:	I
Design Population*:		1129		WWT Class:	II
Design BOD (influent lbs/day):		250		Total Points:	40
Is this a change from a prior classification?		NO			
1. Design Population	1129	or Population Equivalent	250mg/l		
Based on: Flow (gallons/person/day)	80	BOD (pounds/person/day)			
751 to 2,000				1.0	1.0
2. Average Dry Weather Flow (Design Capacity)					
Greater than 0.075 MGD to 0.1 MGD				1.0	1.0
3. Unit Processes					
Preliminary Treatment and Plant Hydraulics					
Screen(s) (in-situ or mechanical, coarse solids only)				1.0	1.0
Pump/Lift Station(s) (pumping of main flow)				2.0	2.0
Secondary, Advanced, and Tertiary Treatment					
Stabilization Lagoons (2 or more cells with full aeration)				9.0	9.0
Solids Handling (excludes long-term storage in treatment lagoons above)					
Non-Beneficial Sludge Disposal (landfill or burial) send to Salem WWTP				1.0	1.0
Disinfection					
Liquid Chlorine Disinfection				2.0	2.0
Dechlorination System				4.0	4.0
4. Effluent Permit Requirements					
Minimum of Secondary Effluent Limitation for BOD and/or TSS 30/50				2.0	2.0
6. Sampling and Laboratory Testing					
Sample for BOD, (performed by outside lab)				2.0	2.0
Total Suspended Solids analysis (performed at treatment plant)				4.0	4.0
Bacteriological analysis (performed at wastewater treatment plant lab)				2.0	2.0
Nutrient, Heavy Metals, or Organic analysis (performed by outside lab)				*3.0	3.0
** ≤ 1 per month = 1 point*					
STEP 2: Complexity Reflected in OAR 340-049-0020(4)					
Note: This step may justify a higher classification. Points shown are given as guidance.					
SCADA or similar instrumentation providing data/w process op.				2.0 - 4.0	2.0
Class B, C, D and Non-disinfected Recycle (surface & subsurface)				3.0	3.0
Sludge dewatering using bag or tube system (TANK)				1.0	
Standby power				1.0 - 3.0	1.0
				Total	40.0

Appendix D
Financial

CITY OF AURORA, OREGON
ANNUAL FINANCIAL REPORT
Year Ended June 30, 2016

CITY OF AURORA, OREGON
CITY OFFICIALS
JUNE 30, 2016

MAYOR

Bill Graupp	14629 Ehlen Road NE Aurora, Oregon 97002

CITY COUNCIL MEMBERS

Jason Sahlin	21011 Main Street NE Aurora, Oregon 97002
Kris Sallee	21311 Main Street NE Aurora, Oregon 97002
Bob Southard	21187 Highway 99E Aurora, Oregon 97002
Tom Heitmanek	21354 Liberty Street NE Aurora, Oregon 97002

CITY ADMINISTRATION

Kelly Richardson, City Recorder
35296 S. Sawtelle Road
Molalla, Oregon 97038

Mary Lambert, Finance Officer
11280 S Riggs Damm Road
Canby, Oregon 97013

MAILING ADDRESS

21420 Main Street NE
Aurora, Oregon 97002

CITY OF AURORA, OREGON
TABLE OF CONTENTS

GROVE, MUELLER & SWANK, P.C.
CERTIFIED PUBLIC ACCOUNTANTS AND CONSULTANTS
475 Cottage Street NE, Suite 200, Salem, Oregon 97301
(503) 581-7788

INDEPENDENT AUDITOR'S REPORT

Honorable Mayor and Council Members
City of Aurora
21420 Main Street NE
Aurora, Oregon 97002

Report on the Financial Statements

We have audited the accompanying modified cash basis financial statements of the governmental activities, the business-type activities, each major fund, and the aggregate remaining fund information of the City of Aurora, as of and for the year ended June 30, 2016, and the related notes to the financial statements, which collectively comprise the City's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with the modified cash basis of accounting described in the notes to the financial statements; this includes determining that the modified cash basis of accounting is an acceptable basis for the preparation of the financial statements in the circumstances. Management is also responsible for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on these modified cash basis financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the City's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the City's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the modified cash basis financial statements referred to above present fairly, in all material respects, the respective modified cash basis financial position of the governmental activities, the business-type activities, each major fund, and the aggregate remaining fund information of the City of Aurora, as of June 30, 2016, and the respective changes in modified cash basis financial position thereof for the year then ended in accordance with the basis of accounting described in the notes to the financial statements.

Basis of Accounting

We draw attention to the notes of the financial statements that describes the basis of accounting. The financial statements are prepared on the modified cash basis of accounting, which is a basis of accounting other than accounting principles generally accepted in the United States of America. Our opinions are not modified with respect to this matter.

Other Matters

Report on Supplemental and Other Information

Our audit was conducted for the purpose of forming opinions on the financial statements as a whole that collectively comprise the City's basic financial statements. Management's discussion and analysis, budgetary comparison information and combining nonmajor fund financial statements are presented for purposes of additional analysis and are not required parts of the basic financial statements.

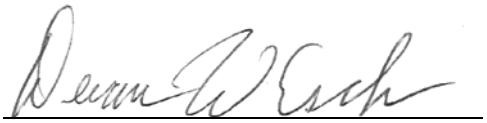
The supplemental information as listed in the table of contents is the responsibility of management and was derived from, and relates directly to, the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the basic financial statements as a whole on the basis of accounting described in notes to the financial statements.

Management's discussion and analysis has not been subjected to the auditing procedures applied in the audit of the basic financial statements, and accordingly, we do not express an opinion or provide any assurance on such information.

Other Legal and Regulatory Requirements

In accordance with Minimum Standards for Audits of Oregon Municipal Corporations, we have issued our report dated December 1, 2016, on our consideration of the City's compliance with certain provisions of laws and regulations, including the provisions of Oregon Revised Statutes as specified in Oregon Administrative Rules. The purpose of that report is to describe the scope of our testing of compliance and the results of that testing and not to provide an opinion on compliance.

GROVE, MUELLER & SWANK, P.C.
CERTIFIED PUBLIC ACCOUNTANTS

By: 

Devan W. Esch, A Shareholder
December 1, 2016

CITY OF AURORA, OREGON

Management's Discussion and Analysis
June 30, 2016

As management of the City of Aurora, we offer readers of the financial statements this narrative overview and analysis of the financial activities for the fiscal year ended June 30, 2016.

Financial Highlights

	June 30, 2016	June 30, 2015	change
Net position	$ 1,794,290	$ 1,547,836	$ 246,454
Change in net position	246,454	248,153	(1,699)
Governmental net position	927,100	850,185	76,915
Proprietary net position	867,190	697,651	169,539
Change in governmental net position	76,915	124,575	(47,660)
Change in proprietary net position	169,539	123,578	45,961

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the City of Aurora's basic financial statements. The City's basic financial statements consist of three components: 1) government-wide financial statements, 2) fund financial statements, and 3) notes to the financial statements. This report also contains supplementary and other information in addition to the basic financial statements themselves.

Government-wide financial statements. The government-wide financial statements are designed to provide readers with a broad overview of the City's finances, in a manner similar to a private-sector business. These statements include:

The Statement of Net Position (Modified Cash Basis). This presents information on the assets and liabilities of the City as of the date on the statement. Net position is what remains after the liabilities have been paid or otherwise satisfied. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the City is improving or deteriorating.

The Statement of Activities (Modified Cash Basis). The *statement of activities* presents information showing how the net position of the City changed over the most recent fiscal year by tracking revenues, expenditures and other transactions that increase or reduce net position.

In the government-wide financial statements, the City's activities are shown as governmental and business-type activities. Governmental activities include all basic City government functions, such as administration, city hall, legal, parks, streets and police. These activities are primarily financed through property taxes and other intergovernmental activities. Business-type activities are those which are primarily financed through charges to customers, and include water and sewer operations.

Fund financial statements. The *fund financial statements* provide more detailed information about the City's funds, focusing on its most significant or "major" funds – not the City of Aurora as a whole. A fund is a grouping of related accounts that is used to maintain control over resources that have been segregated for specific activities or objectives. The City of Aurora, like state and other local governments, uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements. All of the funds of the City can be divided into two categories: governmental funds and proprietary funds.

Governmental funds. The *governmental funds* are used to account for essentially the same functions reported as *governmental activities* in the government-wide financial statements. Because the focus of governmental funds is narrower than that of the government-wide financial statements, it is useful in obtaining an understanding of each fund's activity.

Proprietary funds. Proprietary funds are used to account for funds which are intended to recover all or a significant portion of their costs through user fees and charges (business-type activities). Proprietary funds whose primary user is the public are known as enterprise funds.

Notes to the financial statements. The notes provide additional information that is essential to a full understanding of the data provided in the government-wide and fund financial statements.

Other information. In addition to the basic financial statements and accompanying notes, this report also presents certain *other supplemental information*, including the budgetary comparison schedules and the combining non-major fund financial statements.

Government-wide Financial Analysis

Statements of Net Position (modified cash basis)
June 30,

	2016			2015		
	Governmental Activities	Business-type Activities	Total	Governmental Activities	Business-type Activities	Total
Cash and cash equivalents	$ 927,100	$ 867,190	$ 1,794,290	$ 850,185	$ 697,651	$ 1,547,836
Liabilities	-	-	-	-	-	-
Net Position:						
Restricted	339,256	187,367	526,623	288,118	116,842	404,960
Unrestricted	587,844	679,823	1,267,667	562,067	580,809	1,142,876
Total Net Position	$ 927,100	$ 867,190	$ 1,794,290	$ 850,185	$ 697,651	$ 1,547,836

Statement of Net Position (modified cash basis). The *statement of net position* (modified cash basis) is provided on a comparative basis. As noted earlier, net position may serve over time as a useful indicator of a government's financial position. In the case of the City of Aurora, assets exceeded liabilities by $1,794,290 as of June 30, 2016.

Restricted net position represents sources that are subject to external restrictions on their use, such as debt service or capital projects.

Unrestricted net position is available for general operations of the City.

Statements of Activities (modified cash basis)

Year ended June 30,

	2016			2015		
	Governmental Activities	Business-type Activities	Total	Governmental Activities	Business-type Activities	Total
Revenues						
Program revenues						
Charges for service	$ 152,245	$ 583,868	$ 736,113	$ 84,654	$ 560,611	$ 645,265
Operating grants	57,323	15,752	73,075	53,596	-	53,596
Capital grants	37,125	68,175	105,300	10,905	22,725	33,630
General revenues						
Taxes and assessments	251,730	322,393	574,123	240,785	297,706	538,491
Franchise taxes	63,799	-	63,799	63,723	-	63,723
Intergovernmental	21,593	-	21,593	23,918	-	23,918
Miscellaneous	78,484	5,955	84,439	30,207	5,902	36,109
Total revenues	662,299	996,143	1,658,442	507,788	886,944	1,394,732
Expenses						
General government	130,568	-	130,568	98,545	-	98,545
Public safety	166,400	-	166,400	156,996	-	156,996
Highways and streets	92,707	-	92,707	53,934	-	53,934
Community development	155,999	-	155,999	81,738	-	81,738
Water	-	256,660	256,660	-	247,033	247,033
Sewer	-	609,654	609,654	-	508,333	508,333
Total expenses	545,674	866,314	1,411,988	391,213	755,366	1,146,579
Transfers	(39,710)	39,710	-	8,000	(8,000)	-
Change in net position	76,915	169,539	246,454	124,575	123,578	248,153
Net position, beginning of year	850,185	697,651	1,547,836	725,610	574,073	1,299,683
Net position, end of year	$ 927,100	$ 867,190	$ 1,794,290	$ 850,185	$ 697,651	$ 1,547,836

Statement of Activities (modified cash basis). During the current fiscal year, the City's total net position increased by $246,454 to $1,794,290 from $1,547,836 at the beginning of the year. The key elements of the change in the City's net position for the year ended June 30, 2016 are as follows:

Governmental activities - The City's net position increased by $76,915 from governmental activities. Revenues and expenses were both more than in the prior year.

Business type activities - The City's net position increased by $169,539 from business type activities. This increase is comparable to the increase in the prior year.

Financial Analysis of the City of Aurora's Funds

As noted earlier, the City uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements.

Governmental funds. The focus of the City's governmental funds is to provide information on relatively short-term cash flow and funding for future basic services. Such information is useful in assessing the City's financing requirements. In particular, *fund balance* may serve as a useful measure of a government's net resources available for spending at the end of a fiscal year. As of June 30, 2016, the City's governmental funds reported combined ending fund balances of $927,100 an increase of $76,915 over the prior year.

Business-type funds. The business-type funds account for the City's water and sewer operations. Operating revenues exceeded operating expenses by $169,539 for the year ended June 30, 2016.

General Fund Budgetary Highlights

The governing body made no changes to the General Fund budget for the fiscal year ended June 30, 2016.

Significant Fund Transactions

As noted earlier, the City uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements. The following information details significant fund transactions during the year.

Major Governmental Funds:

General Fund. The General Funds is the primary operating funds of the City. The fund balance was $453,388 as of June 30, 2016. The fund balance increased $52,654 during the current fiscal year. The increase was due primarily to revenues in excess of expenditures in the amount of $72,654 offset by net transfers out of $20,000. As a measure of the liquidity, it may be useful to compare total fund balances to total fund expenditures. Fund balance represents of 103% total expenditures.

Street/Storm Operating Fund. The Street/Storm Operating Fund accounts for street maintenance and improvements. The fund balance decreased by $28,232 during the year due primarily to transfers out in the amount of $20,000.

City Hall Building Fund – The fund balance increased by $12,826 due to transfers in of $10,000 and no expenditures.

Major Proprietary Funds:

Water Fund – The Water fund revenues are from charges for services and expenses are for personal services, materials and services, capital outlay, and debt service. The fund's net position increased $24,063 during the year due to operating income of $114,274 which was substantially used for capital acquisitions, transfers out, and debt payments.

Sewer Fund – The Sewer fund revenues are from charges for services and expenses are for personal services, materials and services, and capital outlay. The fund's net position decreased by $24,807 during the year due to operating income of $44,233 which was used for transfers out and capital acquisitions.

G. O. Wastewater Bond Fund – This fund is used to make payments on the 2009 Sewer bonds. Revenues are primarily property taxes and expenditures are for debt payments. The fund balance increased by $502 during the current year.

Debt Administration

The City had total debt outstanding of $2,587,425 at the end of the current fiscal year.

During the current fiscal year, the City's total debt decreased by $227,640 (9%).

State statutes limit the amount of general obligation debt a governmental entity may issue to 3 percent of its total assessed valuation. The assessed valuation of the City of Aurora is $139,777,108 for the current year; therefore, the current debt limitation is $4,193,313 for the City of Aurora. The City had $2,325,000 general obligation debt subject to the limitation at June 30, 2016.

City of Aurora
Outstanding Debt

	Business-type Activities	
	2016	2015
General obligation bonds	$2,325,000	$2,540,000
Loans	262,425	275,065
Total	$2,587,425	$2,815,065

Additional information on the City of Aurora's long-term debt can be found in the notes to the basic financial statements of this report.

Economic Factors and the Next Year's Budget

The City of Aurora's Budget Committee considered all the following factors while preparing the City budget for the 2016-17 fiscal year:

a. Prior history of revenues and expenditures
b. Capital projects in the water and sewer funds
c. Expected property tax revenues

Requests for Information

This financial report is designed to present the user (citizens, taxpayers, investors and creditors) with a general overview of the City's finances and to demonstrate the City's accountability. Questions concerning any of the information provided in this report or requests for additional information should be addressed to:

City Recorder
City of Aurora
21420 Main Street NE
Aurora, Oregon 97002

BASIC FINANCIAL STATEMENTS

CITY OF AURORA, OREGON
STATEMENT OF NET POSITION (MODIFIED CASH BASIS)
JUNE 30, 2016

	Governmental Activities	*Business-type Activities*	*Totals*
ASSETS			
Cash and cash equivalents	$ 927,100	$ 867,190	$ 1,794,290
LIABILITIES	-	-	-
NET POSITION			
Restricted for:			
Customer deposits	-	8,910	8,910
Debt service	-	22,292	22,292
Capital outlay	136,635	156,165	292,800
Streets	202,621	-	202,621
Unrestricted	587,844	679,823	1,267,667
Total Net Position	$ 927,100	$ 867,190	$ 1,794,290

The accompanying notes are an integral part of the financial statements.

CITY OF AURORA, OREGON
STATEMENT OF ACTIVITIES (MODIFIED CASH BASIS)
YEAR ENDED JUNE 30, 2016

FUNCTIONS/PROGRAMS	***Expenses***	***Program Revenues***		
		Fees, Fines and Charges for Services	***Operating Grants and Contributions***	***Capital Grants and Contributions***
Governmental activities:				
General government	$ 130,568	$ 8,389	$ -	$ -
Public safety	166,400	19,415	-	-
Highways and streets	92,707	37,034	56,323	26,100
Community development	155,999	87,407	1,000	11,025
Total Governmental activities	545,674	152,245	57,323	37,125
Business-type activities:				
Water	256,660	299,159	-	49,887
Sewer	609,654	284,709	15,752	18,288
Total Business-type activities	866,314	583,868	15,752	68,175
Total Activities	$ 1,411,988	$ 736,113	$ 73,075	$ 105,300
General Revenues:				
Property taxes				
Franchise taxes				
Intergovernmental				
Miscellaneous				
Total General Revenues				
Transfers				
Change in net position				
Net Position - beginning of year				
Net Position - end of year				

Net (Expenses) Revenues and Changes in Net Position		
Governmental Activities	*Business-type Activities*	*Total*
$ (122,179)	$ -	$ (122,179)
(146,985)	-	(146,985)
26,750	-	26,750
(56,567)	-	(56,567)
(298,981)	-	(298,981)
-	92,386	92,386
-	(290,905)	(290,905)
-	(198,519)	(198,519)
(298,981)	(198,519)	(497,500)
251,730	322,393	574,123
63,799	-	63,799
21,593	-	21,593
78,484	5,955	84,439
415,606	328,348	743,954
(39,710)	39,710	-
76,915	169,539	246,454
850,185	697,651	1,547,836
$ 927,100	$ 867,190	$ 1,794,290

The accompanying notes are an integral part of the financial statements.

CITY OF AURORA, OREGON
BALANCE SHEET (MODIFIED CASH BASIS) - GOVERNMENTAL FUNDS
JUNE 30, 2016

		Special Revenue	***Capital Projects***
	General	***Street / Storm Operating***	***City Hall Building***
ASSETS			
Cash and cash equivalents	$ 453,388	$ 153,660	$ 133,306
LIABILITIES AND FUND BALANCE			
Liabilities:	$ -	$ -	$ -
Fund Balance:			
Restricted for:			
Capital outlay	-	-	-
Community development	-	-	-
Streets	-	153,660	-
Committed to:			
Capital outlay	-	-	133,306
Unassigned	453,388	-	-
Total Fund Balance	453,388	153,660	133,306
Total Liabilities and Fund Balance	$ 453,388	$ 153,660	$ 133,306

Other Governmental Funds	*Total*
$ 186,746	$ 927,100
$ -	$ -
125,223	125,223
-	-
48,961	202,621
12,562	145,868
-	453,388
186,746	927,100
$ 186,746	$ 927,100

The accompanying notes are an integral part of the financial statements.

CITY OF AURORA, OREGON
STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCES – (MODIFIED CASH BASIS) – GOVERNMENTAL FUNDS
YEAR ENDED JUNE 30, 2016

`

		Special Revenue	***Capital Projects***
	General	***Street / Storm Operating***	***City Hall Building***
REVENUES			
Taxes and assessments	$ 251,730	$ -	$ -
Fines and forfeitures	19,415	-	-
Licenses and permits	157,553	-	2,041
Charges for services	-	23,338	-
Intergovernmental	22,593	56,323	-
Miscellaneous	60,623	1,062	785
Total Revenues	511,914	80,723	2,826
EXPENDITURES			
General government	118,009	-	-
Public safety	166,400	-	-
Highways and streets	-	72,597	-
Community development	101,880	-	-
Parks	40,414	-	-
Capital outlay	12,557	16,358	-
Total Expenditures	439,260	88,955	-
REVENUES OVER (UNDER) EXPENDITURES	72,654	(8,232)	2,826
OTHER FINANCING SOURCES (USES)			
Transfers in	39,710	-	10,000
Transfers out	(59,710)	(20,000)	-
Total Other Financing Sources (Uses)	(20,000)	(20,000)	10,000
NET CHANGE IN FUND BALANCE	52,654	(28,232)	12,826
FUND BALANCE, beginning of year	400,734	181,892	120,480
FUND BALANCE, end of year	$ 453,388	$ 153,660	$ 133,306

Other Governmental Funds	*Total*
$ -	$ 251,730
-	19,415
41,993	201,587
13,695	37,033
-	78,916
11,148	73,618
66,836	662,299
13,706	131,715
-	166,400
-	72,597
-	101,880
-	40,414
3,753	32,668
17,459	545,674
49,377	116,625
30,000	79,710
(39,710)	(119,420)
(9,710)	(39,710)
39,667	76,915
147,079	850,185
$ 186,746	$ 927,100

The accompanying notes are an integral part of the financial statements.

CITY OF AURORA, OREGON
STATEMENT OF FUND NET POSITION (MODIFIED CASH BASIS) - ENTERPRISE FUNDS
JUNE 30, 2016

	Water	***Sewer***	***G.O. Wastewater Bond Fund***
ASSETS			
Cash and cash equivalents	$ 253,678	$ 231,723	$ 22,292
LIABILITIES	-	-	-
NET POSITION			
Restricted for:			
Customer deposits	8,910	-	-
Debt service	-	-	22,292
Construction	-	-	-
Unrestricted	244,768	231,723	-
Total Net Position	$ 253,678	$ 231,723	$ 22,292

Other Business-type Funds	*Total*
$ 359,497	$ 867,190
-	-
-	8,910
-	22,292
156,165	156,165
203,332	679,823
$ 359,497	$ 867,190

The accompanying notes are an integral part of the financial statements.

CITY OF AURORA, OREGON
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN FUND NET POSITION
(MODIFIED CASH BASIS) - ENTERPRISE FUNDS
YEAR ENDED JUNE 30, 2016

	Water	***Sewer***
OPERATING REVENUES		
Charges for services	$ 299,160	$ 284,709
Miscellaneous	70	-
Total Operating Revenues	299,230	284,709
OPERATING EXPENSES		
Personal services	79,367	66,996
Materials and services	105,589	173,480
Total Operating Expenses	184,956	240,476
OPERATING INCOME	114,274	44,233
NONOPERATING ITEMS		
Taxes and assessments	-	-
Intergovernmental	-	-
Interest revenue	1,493	1,411
Capital acquisitions	(50,812)	(30,451)
Debt payments		
Principal	(12,640)	-
Interest	(8,252)	-
Total Nonoperating Items	(70,211)	(29,040)
NET INCOME BEFORE CONTRIBUTIONS AND TRANSFERS	44,063	15,193
Capital contributions	-	-
Transfers in	-	-
Transfers out	(20,000)	(40,000)
CHANGE IN NET POSITION	24,063	(24,807)
NET POSITION, beginning of year	229,615	256,530
NET POSITION, end of year	$ 253,678	$ 231,723

G.O. Wastewater Bond Fund	*Other Business-type Funds*	*Total*
$ -	$ -	$ 583,869
-	-	70
-	-	583,939
-	-	146,363
-	-	279,069
-	-	425,432
-	-	158,507
322,394	-	322,394
-	15,752	15,752
1,083	1,896	5,883
-	(15,752)	(97,015)
(215,000)	-	(227,640)
(107,975)	-	(116,227)
502	1,896	(96,853)
502	1,896	61,654
-	68,175	68,175
-	99,710	99,710
-	-	(60,000)
502	169,781	169,539
21,790	189,716	697,651
$ 22,292	$ 359,497	$ 867,190

The accompanying notes are an integral part of the financial statements.

SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The City of Aurora, Oregon is governed by an elected mayor and four council members who comprise the City Council. The City Council exercises supervisory responsibilities over City operations, but day-to-day management control is the responsibility of a city recorder. All significant activities and organizations for which the City is financially accountable are included in the basic financial statements.

There are certain governmental agencies and various service districts which provide services within the City. These agencies have independently elected governing boards and the City is not financially accountable for these organizations. Therefore, financial information for these agencies is not included in the accompanying basic financial statements.

As discussed further under *Measurement Focus and Basis of Accounting*, these financial statements are presented on a modified cash basis of accounting, which is a basis of accounting other than accounting principles generally accepted in the United States of America (GAAP) established by the Governmental Accounting Standards Board (GASB). These modified cash basis financial statements generally meet the presentation and disclosure requirements applicable to GAAP, in substance, but are limited to the elements presented in the financial statements and the constraints of the measurement and recognition criteria of the modified cash basis of accounting.

Basic Financial Statements

Basic financial statements are presented at both the government-wide and fund financial level. Both levels of statements categorize primary activities as either governmental or business-type. Governmental activities, which are normally supported by taxes and intergovernmental revenues, are reported separately from business-type activities, which rely to a significant extent on fees and charges for support.

Government-wide financial statements display information about the City as a whole. For the most part, the effect of interfund activity has been removed from these statements. These statements focus on the sustainability of the City as an entity and the change in aggregate financial position resulting from the activities of the fiscal period. These aggregated statements consist of the Statement of Net Position (modified cash basis) and the Statement of Activities (modified cash basis).

The Statement of Net Position (modified cash basis) presents the assets and liabilities of the City. Net position, representing assets less liabilities, is shown in two components: restricted for special purposes, amounts which must be spent in accordance with legal restrictions; and unrestricted, the amount available for ongoing City activities.

The Statement of Activities (modified cash basis) demonstrates the degree to which the direct expenses of a given function or segment are offset by program revenues. *Direct expenses* are those that are clearly identifiable with a specific function or segment. *Program revenues* include (1) charges to customers or applicants who purchase, use or directly benefit from goods, services or privileges provided by a given function or segment, and (2) grants and contributions that are restricted to meeting the operational or capital requirements of a particular function or segment. Taxes and other items not properly included among program revenues are reported instead as *general revenues*.

Fund financial statements display information at the individual fund level. Each fund is considered to be a separate accounting entity. Funds are classified and summarized as governmental, proprietary or fiduciary. Currently, the City has governmental funds (general, special revenue, and capital projects) and proprietary type funds (enterprise). Major individual governmental funds and proprietary funds are reported as separate columns in the fund financial statements.

***SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES** (Continued)*

Basis of Presentation

The financial transactions of the City are recorded in individual funds. Each fund is accounted for by providing a separate set of self-balancing accounts that comprise its assets, liabilities, fund equity, revenues and expenditures / expenses. The various funds are reported by generic classification within the financial statements.

Accounting principles generally accepted in the United States of America set forth minimum criteria (percentage of the assets, liabilities, revenues or expenditures / expenses of either fund category or the government and enterprise combined) for the determination of major funds.

The City reports the following governmental funds as major funds:

General Fund

This fund accounts for the basic governmental financial operations of the City. Principal sources of revenues are property taxes, licenses and permits, franchise taxes and State shared revenues. Primary expenditures are for administration, police protection, parks, community development and municipal court.

Street/Storm Operating Fund

Gas tax apportionments received from the State are recorded in this fund. Expenditures are for road construction and maintenance.

City Hall Building Fund

This fund accounts for monies set aside by the City for the renovation of the City Hall building.

The following governmental funds are considered non-major:

Park SDC Fund

This fund was established to account for revenues from park system development charges and to provide for future parks capital improvement projects.

Park Reserve Fund

This fund accounts for monies set aside by the City Council and designated for park projects.

Street/Storm SDC Fund

This fund was established to account for revenues from street/storm system development charges and to provide for future capital improvements to the street and storm system.

Street/Storm Reserve Fund

This fund was established to account for revenues set aside to provide for future street/storm capital improvement projects.

***SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES** (Continued)*

Basis of Presentation (continued)

SPWF Project Maintenance Fund

This fund was established to account for monies to be used for future payments of the local improvement district loan. The fund was closed in the current year and the residual cash transferred to the General Fund.

Aurora Colony Days

This fund accounts for revenues and expenditures related to the annual Colony Days events.

Proprietary funds are used to account for the acquisition, operation, maintenance and debt service of the sewer and water systems. These funds are entirely or predominantly self-supported through user charges to customers.

The City reports the following proprietary funds as major funds:

Water Fund

Financial activities of the City's water utility are recorded in this fund. Revenues consist primarily of user charges. Expenditures are primarily for operation of the utility and for acquisition of property, plant and equipment.

Sewer Fund

Financial activities of the City's sewer utility are recorded in this fund. Revenues consist primarily of user charges. Expenses are primarily for operation of the utility and for acquisition of property, plant and equipment.

General Obligation Wastewater Bond Fund

This fund was established to account for revenues set aside for debt service on the general obligation bond and loan repayments. Taxes and interfund transfers are the primary revenues. Payments are for debt service.

The following proprietary funds are considered non-major:

Water SDC Fund

This fund was established to account for revenues from water system development charges and to provide for future capital improvements to the water system.

Water Reserve Fund

This fund is used to accumulate resources for major repairs and improvements to the water system through transfers from other funds.

***SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES** (Continued)*

Basis of Presentation (continued)

Sewer SDC Fund

This fund was established to account for revenues from sewer system development charges and to provide for future capital improvements to the sewer system.

Sewer Reserve Fund

This fund accumulates resources for major repairs and improvements to the sewer system through transfers from other funds.

Fund Balance

In governmental funds, the City's policy is to first apply the expenditure toward restricted fund balance and then to other less-restrictive classifications - committed and then assigned fund balances before using unassigned fund balances.

Fund balance is reported as non-spendable when the resources cannot be spent because they are either in a legally or contractually required to be maintained intact or non-spendable form. Resources in non-spendable form include inventories, prepaids and deposits, and assets held for resale.

Fund balance is reported as restricted when the constraints placed on the use of resources are either: (a) externally imposed by creditors (such as through debt covenants), grantors, contributors, or laws or regulations of other governments; or (b) imposed by law through constitutional provisions or enabling legislation.

Fund balance is reported as committed when the City Council takes formal action that places specific constraints on how the resources may be used. The City Council can modify or rescind the commitment at any time through taking a similar formal action.

Resources that are constrained by the City's intent to use them for a specific purpose, but are neither restricted nor committed, are reported as assigned fund balance. Intent is expressed when the City Council approves which resources should be "reserved" during the adoption of the annual budget. The City's Finance Officer uses that information to determine whether those resources should be classified as assigned or unassigned for presentation in the City's Annual Financial Report.

Unassigned fund balance is the residual classification for the General Fund. This classification represents fund balance that has not been restricted, committed, or assigned within the General Fund. This classification is also used to report any negative fund balance amounts in other governmental funds.

***SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES** (Continued)*

Definitions of Governmental Fund Types

The General Fund is used to account for the basic operations of the City, which include general government, public safety, highways and streets, and community development.

Special Revenue Funds are used to account for and report the proceeds of specific revenue sources that are restricted or committed to expenditure for specified purposes other than debt service or capital projects. The term "proceeds of specific revenues sources" means that the revenue sources for the fund must be from restricted or committed sources, specifically that a substantial portion of the revenue must be from these sources and be expended in accordance with those requirements.

Capital Projects Funds are utilized to account for financial resources to be used for the acquisition or construction of capital equipment and facilities.

Measurement Focus and Basis of Accounting

Measurement focus is a term used to describe what transactions or events are recorded within the various financial statements. Basis of accounting refers to when and how transactions or events are recorded, regardless of the measurement focus applied.

In the government-wide Statement of Net Position (Modified Cash Basis) and Statement of Activities (Modified Cash Basis), both governmental and business-type activities are presented using the economic resource measurement focus, within the limitations of the modified cash basis of accounting, as defined below.

In the fund financial statements, the current financial resources measurement focus or the economic resources measurement focus is applied to the modified cash basis of accounting, is used as appropriate:

a. All governmental funds utilize a current financial resources measurement focus within the limitations of the modified cash basis of accounting. Only current financial assets and liabilities are generally included on their balance sheets. Their operating statements present sources and uses of available spendable financial resources during a given period. These funds use fund balance as their measure of available spendable financial resources at the end of the period.
b. The proprietary funds utilize an economic resource measurement focus within the limitations of the modified cash basis of accounting. The accounting objectives of this measurement focus are the determination of operating income, change in net position (or cost recovery), net financial position, and cash flows. All assets, deferred outflows, liabilities, and deferred inflows (whether current or noncurrent or financial or nonfinancial) associated with their activities are generally reported within the limitations of the modified cash basis of accounting.

The financial statements are presented on a modified cash basis of accounting, which is a basis of accounting other than GAAP as established by GASB. This basis of accounting involves modifications to the cash basis of accounting to report in the statements of net position or balance sheets cash transactions or events that provide a benefit or result in an obligation that covers a period greater than the period in which the cash transaction or event occurred. Such reported balances include:

***SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES** (Continued)*

Measurement Focus and Basis of Accounting (Continued)

1. Interfund receivables and payables that are temporary borrowing and result from transactions involving cash or cash equivalents are recognized.
2. Assets that normally convert to cash or cash equivalents (e.g., certificates of deposit, external cash pools, and marketable investments) that arise from transactions and events involving cash or cash equivalents are recognized.
3. Liabilities for cash (or cash equivalents) held on behalf of others or held in escrow are recognized.

The modified cash basis of accounting differs from GAAP primarily because certain assets and their related revenues (such as accounts receivable and revenue for billed or provided services not yet collected and other accrued revenue and receivables) and certain liabilities and their related expenses or expenditures (such as accounts payable and expenses for goods and services received but not yet paid and other accrued expenses and liabilities) are not recorded in these financial statements. In addition, other economic assets, deferred outflows, liabilities, and deferred inflows that do not arise from a cash transaction or event are not reported, and the measurement of reported assets and liabilities does not involve adjustment to fair value. Additionally, capital assets such as property and equipment, and long-term liabilities such as debt are only reported in the notes to the financial statements.

If the City utilized the basis of accounting recognized as generally accepted in the United States of America, the fund financial statements for the governmental funds would use the modified accrual basis of accounting, and the fund financial statements for the enterprise funds would use the accrual basis of accounting. All government-wide financial statements would be presented on the accrual basis of accounting.

The City's policy, although not in accordance with accounting principles generally accepted in the United States of America, is acceptable under Oregon Law (ORS 294.333), which leaves the selection of the method of accounting to the discretion of the municipal corporation.

Enterprise funds distinguish between operating revenues and expenses and non-operating items. Operating revenues and expenses result from providing services to customers in connection with ongoing utility operations. The principal operating revenues are charges to customers for service. Operating expenses include payroll and related costs, materials and supplies, and capital outlay. All revenues not considered operating are reported as non-operating items.

When both restricted and unrestricted resources are available for use, it is the City's policy to use restricted resources first, then unrestricted resources as they are needed.

Cash and Cash Equivalents

The City maintains cash and cash equivalents in a common pool that is available for use by all funds. Each fund type's portion of this pool is displayed as cash and cash equivalents. The City considers cash on hand, demand deposits and savings accounts, and short-term investments with an original maturity of three months or less from the date of acquisition to be cash and cash equivalents.

Oregon Revised Statutes authorize the City to invest in certificates of deposit, savings accounts, bank repurchase agreements, bankers' acceptances, general obligations of U.S. Government and its agencies, certain bonded obligations of Oregon municipalities, and the State Treasurer's Local Government Investment Pool, among others.

***SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES** (Continued)*

Cash and Cash Equivalents (Continued)

For the purpose of financial reporting, cash and cash equivalents includes all demand and savings accounts and certificates of deposit or short-term investments with an original maturity of three months or less.

Investments in the Local Government Investment Pool are stated at cost, which approximates fair value.

Property Taxes

Property taxes are levied by the County Assessor and collected by the County Tax Collector. The taxes are levied and become a lien as of July 1. They may be paid in three installments payable in equal payments due November 15, February 15 and May 15. The City's property tax collection records show that most of the property taxes due are collected during the year of levy and delinquent taxes are collected in the next few years.

Capital Assets

The City does not maintain historical cost or depreciation records for capital assets. Therefore, capital assets are not reported on the government-wide Statement of Net Position or the enterprise funds statements of Fund Net Position.

Long-Term Debt

Long-term debt is presented only in the notes to the financial statements. Payments of principal and interest are recorded as expenditures / expenses when paid.

Accrued Compensated Absences

Accumulated unpaid vacation pay is not accrued. Earned but unpaid sick pay is recorded as an expenditure / expense when paid.

Budget and Budgetary Accounting

The City adopts the budget on an object basis; therefore, expenditures of a specific object within a fund may not legally exceed that object's appropriations. The City Council may amend the budget to expend unforeseen revenues by supplemental appropriations. All supplemental appropriations are included in the budget comparison statements. Appropriations lapse at year end and may not be carried over. The City does not use encumbrance accounting.

Use of Estimates

The preparation of basic financial statements in conformity with the modified cash basis of accounting requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the basic financial statements and reported amounts of revenues and expenditures during the reporting period. Actual results may differ from those estimates.

CASH AND CASH EQUIVALENTS

Cash and cash equivalents are comprised of the following at June 30, 2016:

	Carrying Value	*Fair Value*
Cash		
Cash on hand	$ 400	$ 400
Deposits with financial institutions	43,019	43,019
Local Government Investment Pool	1,750,871	1,750,871
	$ 1,794,290	$ 1,794,290

Deposits

The City's deposits with various financial institutions had a book value of $43,019 a bank value of $114,961 as of June 30, 2016. The difference is due to transactions in process. Bank deposits are secured to legal limits by federal deposit insurance. The remaining amount is secured in accordance with ORS 295 under a collateral program administered by the Oregon State Treasurer.

Custodial Credit Risk - Deposits

This is the risk that in the event of a bank failure, the City's deposits may not be returned. The Federal Depository Insurance Corporation (FDIC) provides insurance for the City's deposits with financial institutions for up to $250,000 for the aggregate of all demand deposits and the aggregate of all time deposit and savings accounts at each institution. Deposits in excess of FDIC coverage are with institutions participating in the Oregon Public Funds Collateralization Program (PFCP). The PFCP is a shared liability structure for participating bank depositories, better protecting public funds though still not guaranteeing that all funds are 100% protected. Barring any exceptions, a bank depository is required to pledge collateral valued at least 10% of their quarter-end public fund deposits if they are well capitalized, 25% of their quarter-end public fund deposits if they are adequately capitalized, or 110% of their quarter-end public fund deposits if they are undercapitalized or assigned to pledge 110% by the Office of the State Treasurer. In the event of a bank failure, the entire pool of collateral pledged by all qualified Oregon public funds bank depositories is available to repay deposits of public funds of government entities. As of June 30, 2016 all of the City’s bank balances were covered by FDIC insurance.

Local Government Investment Pool

The State Treasurer of the State of Oregon maintains the Oregon Short-Term Fund, of which the Local Government Investment Pool is part. Participation by local governments is voluntary. The State of Oregon investment policies are governed by statute and the Oregon Investment Council. In accordance with Oregon Statutes, the investment funds are invested as a prudent investor would do, exercising reasonable care, skill and caution. The Oregon Short-Term Fund is the LGIP for local governments and was established by the State Treasurer. It was created to meet the financial and administrative responsibilities of federal arbitrage regulations.

The investments are regulated by the Oregon Short-Term Fund Board and approved by the Oregon Investment Council (ORS 294.805 to 294.895). At June 30, 2016, the fair value of the position in the Oregon State Treasurer’s Short-Term Investment Pool was approximately equal to the value of the pool shares. The investment in the Oregon Short-Term Fund is not subject to risk evaluation. The LGIP is not rated for credit quality.

Separate financial statements for the Oregon Short-Term Fund are available from the Oregon State Treasurer.

***CASH AND CASH EQUIVALENTS** (Continued)*

Interest Rate Risk

In accordance with its investment policy, the City manages its exposure to declines in fair value of its investments by limiting its investments the LGIP.

Custodial Credit Risk - Investments

For an investment, this is the risk that, in the event of a failure of the counterparty, the City will not be able to recover the value of its investments or collateralized securities that are in the possession of an outside party. The City's investment policy limits the types of investments that may be held and does not allow securities to be held by the counterparty.

The LGIP is administered by the Oregon State Treasury with the advice of other state agencies and is not registered with the U.S. Securities and Exchange Commission. The LGIP is an open-ended no-load diversified portfolio offered to any agency, political subdivision, or public corporation of the state that by law is made the custodian of, or has control of any fund. The LGIP is commingled with the State's short-term funds. In seeking to best serve local governments of Oregon, the Oregon Legislature established the Oregon Short Term Fund Board, which has established diversification percentages and specifies the types and maturities of the investments.

The purpose of the Board is to advise the Oregon State Treasury in the management and investment of the LGIP. These investments within the LGIP must be invested and managed as a prudent investor would, exercising reasonable care, skill and caution. Professional standards indicate that the investments in external investment pools are not subject to custodial risk because they are not evidenced by securities that exist in physical or book entry form. Nevertheless, management does not believe that there is any substantial custodial risk related to investments in the LGIP.

LONG-TERM DEBT

As a result of the use of the modified cash basis of accounting in this report, obligations related to long-term debt and other obligations are not reported as liabilities in the financial statements. Long-term debt transactions for the year were as follows:

	Original Issue	***Outstanding July 1, 2015***	***Issued***	***Matured/ Redeemed During Year***	***Outstanding June 30, 2016***	***Due Within One Year***
Business-type activities						
General Obligation Bonds issued May 2009, semi-annual payments through 2024 with interest from 2.5% to 4.5%	$ 3,530,000	$ 2,540,000	$ -	$ (215,000)	$ 2,325,000	$ 235,000
Safe Drinking Water Revolving Loan Fund Award Contract Loan issued through OECDD issued 2011 with interest and principal payments of $20,892 through 2031 with interest at 3.0%	310,818	275,065	-	(12,640)	262,425	13,019
	$ 3,840,818	$ 2,815,065	$ -	$ (227,640)	$ 2,587,425	$ 248,019

Debt payments on the general obligation bonds are made from the G.O. Wastewater Bond Fund.

***LONG-TERM DEBT** (Continued)*

Future debt service requirements are as follows:

Fiscal Year Ending June 30,	***Principal***	***Interest***	***Total***
2017	$ 248,019	$ 107,248	$ 355,267
2018	263,410	97,457	360,867
2019	283,812	87,055	370,867
2020	309,226	75,841	385,067
2021	324,653	63,614	388,267
2022-2026	1,045,130	108,479	1,153,609
2027-2031	92,892	11,567	104,459
2032	20,283	607	20,890
	$ 2,587,425	$ 551,868	$ 3,139,293

PENSION PLAN

The Oregon Public Employees Retirement System (OPERS) is a cost-sharing multiple employer defined benefit plan. Qualified employees of the City are provided with pensions through OPERS. Employees hired before August 29, 2003 belong to the Tier One/Tier Two Retirement Benefit Program (established pursuant to ORS Chapter 238), while employees hired on or after August 29, 2003 belong to the OPSRP Pension Program (established pursuant to ORS Chapter 238A). OPERS issues a publicly available financial report that can be obtained at

http://www.oregon.gov/pers/pages/section/financial_reports/financials.aspx.

Benefits provided under ORS Chapter 238 – Tier One/ Tier Two

Pension Benefits: The PERS retirement allowance is payable monthly for life. It may be selected from 13 retirement benefit options. These options include survivorship benefits and lump-sum refunds. The basic benefit is based on years of service and final average salary. A percentage (2.0 percent for police and fire employees, 1.67 percent for general service employees) is multiplied by the number of years of service and the final average salary. Benefits may also be calculated under a formula plus annuity (for members who were contributing before August 21, 1981) or a money match computation if a greater benefit results.

A member is considered vested and will be eligible at minimum retirement age for a service retirement allowance if he or she has had a contribution in each of five calendar years or has reached at least 50 years of age before ceasing employment with a participating employer (age 45 for police and fire members). General service employees may retire after reaching age 55. Police and fire members are eligible after reaching age 50. Tier One general service employee benefits are reduced if retirement occurs prior to age 58 with fewer than 30 years of service. Police and fire member benefits are reduced if retirement occurs prior to age 55 with fewer than 25 years of service. Tier Two members are eligible for full benefits at age 60. The ORS Chapter 238 Defined Benefit Pension Plan is closed to new members hired on or after August 29, 2003.

***PENSION PLAN** (Continued)*

Death Benefits: Upon the death of a non-retired member, the beneficiary receives a lump-sum refund of the member's account balance (accumulated contributions and interest). In addition, the beneficiary will receive a lump-sum payment from employer funds equal to the account balance, provided one or more of the following conditions are met: the member was employed by a PERS employer at the time of death; the member died within 120 days after termination of PERS-covered employment; the member died as a result of injury sustained while employed in a PERS-covered job, or; the member was on an official leave of absence from a PERS-covered job at the time of death.

Disability Benefits: A member with 10 or more years of creditable service who becomes disabled from other than duty connected causes may receive a non-duty disability benefit. A disability resulting from a job-incurred injury or illness qualifies a member (including PERS judge members) for disability benefits regardless of the length of PERS-covered service. Upon qualifying for either a non-duty or duty disability, service time is computed to age 58 when determining the monthly benefit.

Benefit Changes After Retirement: Members may choose to continue participation in a variable equities investment account after retiring and may experience annual benefit fluctuations due to changes in the market value of equity investments. Under ORS 238.360 monthly benefits are adjusted annually through cost-of-living changes. Under current law, the cap on the COLA in fiscal year 2015 and beyond will vary based on 1.25 percent on the first $60,000 of annual benefit and 0.15 percent on annual benefits above $60,000.

Benefits provided under Chapter 238A - OPSRP Pension Program (OPSRP DB)
This portion of OPSRP provides a life pension funded by employer contributions. Benefits are calculated with the following formula for members who attain normal retirement age: General service: 1.5 percent is multiplied by the number of years of service and the final average salary. Normal retirement age for general service members is age 65, or age 58 with 30 years of retirement credit.

Police and Fire: 1.8 percent is multiplied by the number of years of service and the final average salary. Normal retirement age for police and fire members is age 60 or age 53 with 25 years of retirement credit. To be classified as a police and fire member, the individual must have been employed continuously as a police and fire member for at least five years immediately preceding retirement.

General Service: 1.5 percent is multiplied by the number of years of service and the final average salary. Normal retirement age for general service members is age 65, or age 58 with 30 years of retirement credit.

A member of the OPSRP Pension Program becomes vested on the earliest of the following dates: the date the member completes 600 hours of service in each of five calendar years, the date the member reaches normal retirement age, and, if the pension program is terminated, the date on which termination becomes effective.

Death Benefits: Upon the death of a non-retired member, the spouse or other person who is constitutionally required to be treated in the same manner as the spouse receives for life 50 percent of the pension that would otherwise have been paid to the deceased member.

Disability Benefits: A member who has accrued 10 or more years of retirement credits before the member becomes disabled or a member who becomes disabled due to job-related injury shall receive a disability benefit of 45 percent of the member's salary determined as of the last full month of employment before the disability occurred.

Benefit Changes After Retirement: Under ORS 238A.210 monthly benefits are adjusted annually through cost-of-living changes. Under current law, the cap on the COLA in fiscal year 2016 and beyond will vary based on 1.25 percent on the first $60,000 of annual benefit and 0.15 percent on annual benefits above $60,000.

***PENSION PLAN** (Continued)*

Contributions

PERS funding policy provides for monthly employer contributions at actuarially determined rates. These contributions, expressed as a percentage of covered payroll, are intended to accumulate sufficient assets to pay benefits when due. This funding policy applies to the PERS Defined Benefit Plan and the Other Postemployment Benefit Plans.

Employer contribution rates during the period were based on the December 31, 2013 actuarial valuation. The City's contribution rates in effect for the fiscal year ended June 30, 2016 were 0.53 percent for Tier One/Two members, 0.45 percent for OPSRP general service members, and 0.45 percent for OPSRP uniformed members. The City's contributions for the year ended June 30, 2016 were $854, excluding amounts to fund employer specific liabilities.

Members of PERS are required to contribute 6% of their salary covered under the plan, which is invested in the OPSRP Individual Account Program. The total contributed by the City on behalf of employees for the year ended December 31, 2015 was $854.

Actuarial Methods and Assumptions:

The employer contribution rates effective July 1, 2015, through June 30, 2017, were set by OPERS using the projected unit credit actuarial cost method. For the Tier One/Tier Two component of the PERS Defined Benefit Plan, this method produced an employer contribution rate consisting of (1) an amount for normal cost (the estimated amount necessary to finance benefits earned by the employees during the current service year), (2) an amount for the amortization of unfunded actuarial accrued liabilities, which are being amortized over a fixed period with new unfunded actuarial accrued liabilities being amortized over 20 years. For the OPSRP Pension Program component of the PERS Defined Benefit Plan, this method produced an employer contribution rate consisting of (a) an amount for normal cost (the estimated amount necessary to finance benefits earned by the employees during the current service year), (b) an amount for the amortization of unfunded actuarial accrued liabilities, which are being amortized over a fixed period with new unfunded actuarial accrued liabilities being amortized over 16 years.

Valuation Date	December 31, 2013 rolled forward to June 30, 2015
Experience Study Report	2014, published September 2015
Actuarial cost method	Entry Age Normal
Amortization method	Amortized as a level percentage of payroll as layered amortization bases over a closed period; Tier One/Tier Two UAL is amortized over 20 years and OPSRP pension UAL is amortized over 16 years.
Asset valuation method	Market value of assets
Actuarial assumptions:	
Inflation rate	2.75 percent
Investment rate of return	7.75 percent
Projected salary increases	3.75 percent overall payroll growth
Cost of living adjustments (COLA)	Blend of 2.00% COLA and graded COLA (1.25%/0.15%) in accordance with *Moro* decision; blend based on service

***PENSION PLAN** (Continued)*

Actuarial Methods and Assumptions: (Continued)

Mortality	Healthy retirees and beneficiaries: RP-2000 Sex-distinct, generational per Scale AA, with collar adjustments and set-backs as described in the valuation. Active members: Mortality rates are a percentage of healthy retiree rates that vary by group, as described in the valuation. Disabled retirees: Mortality rates are a percentage (65% for males, 90% for females) of the RP-2000 static combined disabled mortality sex-distinct table.

Actuarial valuations of an ongoing plan involve estimates of the value of projected benefits and assumptions about the probability of events far into the future. Actuarially determined amounts are subject to continual revision as actual results are compared to past expectations and new estimates are made about the future. Experience studies are performed as of December 31 of even numbered years. The methods and assumptions shown above are based on the 2014 Experience Study which reviewed experience for the four-year period ending on December 31, 2014.

Discount Rate

The discount rate used to measure the total pension liability was 7.75 percent for the Defined Benefit Pension Plan. The projection of cash flows used to determine the discount rate assumed that contributions from plan members and those of the contributing employers are made at the contractually required rates, as actuarially determined. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments for the Defined Benefit Pension Plan was applied to all periods of projected benefit payments to determine the total pension liability.

Long-Term Expected Rate of Return

To develop an analytical basis for the selection of the long-term expected rate of return assumption, in July 2015 the PERS Board reviewed long-term assumptions developed by both Milliman's capital market assumptions team and the Oregon Investment Council's (OIC) investment advisors. The table below shows Milliman's assumptions for each of the asset classes in which the plan was invested at that time based on the OIC long-term target asset allocation. The OIC's description of each asset class was used to map the target allocation to the asset classes shown below. Each asset class assumption is based on a consistent set of underlying assumptions, and includes adjustment for the inflation assumption. These assumptions are not based on historical returns, but instead are based on a forward-looking capital market economic model.

***PENSION PLAN** (Continued)*

Long-Term Expected Rate of Return (Continued)

Asset Class	Target	Compound Annual Return (Geometric)
Core Fixed Income	8.00 %	4.10 %
Short-Term Bonds	8.00	3.65
Bank/Leveraged Loans	3.00	5.69
High Yield Bonds	1.00	6.67
Large/Mid Cap US Equities	15.75	7.96
Small Cap US Equities	1.31	8.93
Micro Cap US Equities	1.31	9.37
Developed Foreign Equities	13.13	8.34
Emerging Market Equities	4.13	10.56
Non-US Small Cap Equities	1.88	9.01
Private Equity	17.50	11.60
Real Estate (Property)	10.00	6.48
Real Estate (REITS)	2.50	8.74
Hedge Fund of Funds - Diversified	2.50	4.94
Hedge Fund - Event-driven	0.63	7.07
Timber	1.88	6.60
Farmland	1.88	7.11
Infrastructure	3.75	8.31
Commodities	1.88	6.07
Assumed Inflation - Mean		2.50

Sensitivity of the City's proportionate share of the net pension liability to changes in the discount rate
The following presents the City's proportionate share of the net pension liability calculated using the discount rate of 7.75, as well as what City's proportionate share of the net pension liability (asset) would be if it were calculated using a discount rate that is 1-percentage-point lower (6.75%) or 1-percentage-point higher (8.75%) than the current rate:

	1% Decrease (6.75%)	Discount Rate (7.75%)	1% Increase (8.75%)
Proportionate share of the net pension liability	$ -	$ -	$ -

TRANSFERS

Fund	*Transfers In*	*Transfers Out*
General	$ 39,710	$ 59,710
Street/Storm Operating	-	20,000
City Hall Building	10,000	-
SPWF Maintenance	-	39,710
Street Reserve	20,000	-
Aurora Colony Days	10,000	-
Water	-	20,000
Sewer	-	40,000
Sewer Reserve	40,000	-
Water Reserve	59,710	-
	$ 179,420	$ 179,420

Transfers are used to (1) move resources from the fund that statute or budget requires to collect them to the fund that statute or budget requires to expend them, (2) move revenues restricted to debt service from the funds collecting the revenues to the debt service fund as debt service payments become due, and (3) use unrestricted revenues collected in the general fund to finance various programs accounted for in other funds in accordance with budgetary authorizations.

CONTINGENCIES

The City purchases commercial insurance to cover all commonly insurable risks, which includes property damage, liability and employee bonds. Most policies carry a small deductible amount. No insurance claims settled in each of the prior three years have exceeded policy coverage.

SUBSEQUENT EVENTS

Management has evaluated subsequent events through December 1, 2016, the date on which the financial statements were available to be issued. Management is not aware of any subsequent events that require recognition or disclosure in the financial statements.

SUPPLEMENTAL INFORMATION

CITY OF AURORA, OREGON
COMBINING BALANCE SHEET (MODIFIED CASH BASIS) - NONMAJOR GOVERNMENTAL FUNDS
JUNE 30, 2016

	Capital Projects		
	Park SDC	***Park Reserve***	***Street / Storm SDC***
ASSETS			
Cash and cash equivalents	$ 42,777	$ 1,150	$ 48,961
LIABILITIES AND FUND BALANCE			
Liabilities:	$ -	$ -	$ -
Fund Balance:			
Restricted for:			
Capital acquisitions	42,777	-	-
Streets	-	-	48,961
Committed to:			
Capital acquisitions	-	1,150	-
Total Fund Balance	42,777	1,150	48,961
Total Liabilities and Fund Balance	$ 42,777	$ 1,150	$ 48,961

Capital Projects			
Street / Storm Reserve	*SPWF Project Maintenance*	*Aurora Colony Days*	*Total*
$ 82,446	$ -	$ 11,412	$ 186,746
$ -	$ -	$ -	$ -
82,446	-	-	125,223
-	-	-	48,961
-	-	11,412	12,562
82,446	-	11,412	186,746
$ 82,446	$ -	$ 11,412	$ 186,746

CITY OF AURORA, OREGON
COMBINING STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - NONMAJOR GOVERNMENTAL FUNDS
YEAR ENDED JUNE 30, 2016

	Capital Projects		
	Park SDC	***Park Reserve***	***Street / Storm SDC***
REVENUES			
Licenses and permits	$ 11,025	$ -	$ 26,100
Charges for services	-	-	-
Miscellaneous	229	7	228
Total Revenues	11,254	7	26,328
EXPENDITURES			
General government	-	-	-
Capital acquisitions	-	-	-
Total Expenditures	-	-	-
REVENUES OVER (UNDER) EXPENDITURES	11,254	7	26,328
OTHER FINANCING SOURCES (USES)			
Transfers in	-	-	-
Transfers out	-	-	-
Total Other Financing Sources and Uses	-	-	-
NET CHANGE IN FUND BALANCE	11,254	7	26,328
FUND BALANCE, beginning of year	31,523	1,143	22,633
FUND BALANCE, end of year	$ 42,777	$ 1,150	$ 48,961

Capital Projects			
Street / Storm Reserve	*SPWF Project Maintenance*	*Aurora Colony Days*	*Total*
$ -	$ -	$ 4,868	$ 41,993
13,695	-	-	13,695
434	-	10,250	11,148
14,129	-	15,118	66,836
-	-	13,706	13,706
3,753	-	-	3,753
3,753	-	13,706	17,459
10,376	-	1,412	49,377
20,000	-	10,000	30,000
-	(39,710)	-	(39,710)
20,000	(39,710)	10,000	(9,710)
30,376	(39,710)	11,412	39,667
52,070	39,710	-	147,079
$ 82,446	$ -	$ 11,412	$ 186,746

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL - GENERAL FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Taxes and assessments	$ 240,932	$ 240,932	$ 251,730	$ 10,798
Fines and forfeitures	15,000	15,000	19,415	4,415
Licenses and permits	98,500	98,500	157,553	59,053
Intergovernmental	37,000	37,000	22,593	(14,407)
Miscellaneous	42,300	42,300	60,623	18,323
Total Revenues	433,732	433,732	511,914	78,182
EXPENDITURES				
Personal services	89,267	89,267	80,514	8,753
Materials and services	346,605	346,605	340,144	6,461
Capital outlay	18,870	18,870	18,602	268
Contingency	324,590	324,590	-	324,590
Total Expenditures	779,332	779,332	439,260	340,072
REVENUES OVER (UNDER) EXPENDITURES	(345,600)	(345,600)	72,654	418,254
OTHER FINANCING SOURCES (USES)				
Transfers in	39,710	39,710	39,710	-
Transfers out	(59,710)	(59,710)	(59,710)	-
Total Other Financing Sources and Uses	(20,000)	(20,000)	(20,000)	-
NET CHANGE IN FUND BALANCE	(365,600)	(365,600)	52,654	418,254
FUND BALANCE, beginning of year	365,600	365,600	400,734	35,134
FUND BALANCE, end of year	$ -	$ -	$ 453,388	$ 453,388

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL - STREET/STORM OPERATING FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Charges for services	$ 22,800	$ 22,800	$ 23,338	$ 538
Intergovernmental	105,000	105,000	56,323	(48,677)
Miscellaneous	1,600	1,600	1,062	(538)
Total Revenues	129,400	129,400	80,723	(48,677)
EXPENDITURES				
Personal services	24,444	24,444	21,191	3,253
Materials and services	70,000	70,000	51,406	18,594
Capital outlay	92,500	92,500	16,358	76,142
Contingency	102,456	102,456	-	102,456
Total Expenditures	289,400	289,400	88,955	200,445
REVENUES OVER (UNDER) EXPENDITURES	(160,000)	(160,000)	(8,232)	151,768
OTHER FINANCING SOURCES (USES)				
Transfers out	(20,000)	(20,000)	(20,000)	-
NET CHANGE IN FUND BALANCE	(180,000)	(180,000)	(28,232)	151,768
FUND BALANCE, beginning of year	180,000	180,000	181,892	1,892
FUND BALANCE, end of year	$ -	$ -	$ 153,660	$ 153,660

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE (MODIFIED CASH BASIS) - BUDGET AND ACTUAL – CITY HALL BUILDING FUND YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	Final	Actual	Variance
REVENUES				
Licenses and permits	$ 1,700	$ 1,700	$ 2,041	$ 341
Miscellaneous	600	600	785	185
Total Revenues	2,300	2,300	2,826	526
EXPENDITURES				
Capital outlay	132,500	132,500	-	132,500
REVENUES OVER (UNDER) EXPENDITURES	(130,200)	(130,200)	2,826	133,026
OTHER FINANCING SOURCES (USES)				
Transfers in	10,000	10,000	10,000	-
NET CHANGE IN FUND BALANCE	(120,200)	(120,200)	12,826	133,026
FUND BALANCE, beginning of year	120,200	120,200	120,480	280
FUND BALANCE, end of year	$ -	$ -	$ 133,306	$ 133,306

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL – PARK SDC FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Licenses and permits	$ 2,205	$ 2,205	$ 11,025	$ 8,820
Miscellaneous	130	130	229	99
Total Revenues	2,335	2,335	11,254	8,919
EXPENDITURES				
Capital outlay	36,055	36,055	-	36,055
NET CHANGE IN FUND BALANCE	(33,720)	(33,720)	11,254	44,974
FUND BALANCE, beginning of year	33,720	33,720	31,523	(2,197)
FUND BALANCE, end of year	$ -	$ -	$ 42,777	$ 42,777

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL – PARK RESERVE FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Intergovernmental	$ 6,000	$ -	$ -	$ -
Miscellaneous	6	6,006	7	(5,999)
Total Revenues	6,006	6,006	7	(5,999)
EXPENDITURES				
Capital outlay	7,148	7,148	-	7,148
NET CHANGE IN FUND BALANCE	(1,142)	(1,142)	7	1,149
FUND BALANCE, beginning of year	1,142	1,142	1,143	1
FUND BALANCE, end of year	$ -	$ -	$ 1,150	$ 1,150

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE (MODIFIED CASH BASIS) - BUDGET AND ACTUAL – STREET/STORM SDC FUND YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	Final	Actual	Variance
REVENUES				
Licenses and permits	$ 11,200	$ 11,200	$ 26,100	$ 14,900
Miscellaneous	80	80	228	148
Total Revenues	11,280	11,280	26,328	15,048
EXPENDITURES				
Capital outlay	31,000	31,000	-	31,000
NET CHANGE IN FUND BALANCE	(19,720)	(19,720)	26,328	46,048
FUND BALANCE, beginning of year	19,720	19,720	22,633	2,913
FUND BALANCE, end of year	$ -	$ -	$ 48,961	$ 48,961

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE (MODIFIED CASH BASIS) - BUDGET AND ACTUAL – STREET/STORM RESERVE FUND YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Charges for services	$ 13,500	$ 13,500	$ 13,695	$ 195
Miscellaneous	200	200	434	234
Total Revenues	13,700	13,700	14,129	429
EXPENDITURES				
Capital outlay	85,700	85,700	3,753	81,947
REVENUES OVER (UNDER) EXPENDITURES	(72,000)	(72,000)	10,376	82,376
OTHER FINANCING SOURCES (USES)				
Transfers in	20,000	20,000	20,000	-
NET CHANGE IN FUND BALANCE	(52,000)	(52,000)	30,376	82,376
FUND BALANCE, beginning of year	52,000	52,000	52,070	70
FUND BALANCE, end of year	$ -	$ -	$ 82,446	$ 82,446

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL – SPWF PROJECT MAINTENANCE FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	*Final*	*Actual*	*Variance*
REVENUES	$ -	$ -	$ -	$ -
EXPENDITURES	-	-	-	-
REVENUES OVER (UNDER) EXPENDITURES	-	-	-	-
OTHER FINANCING SOURCES (USES)				
Transfers out	(39,710)	(39,710)	(39,710)	-
NET CHANGE IN FUND BALANCE	(39,710)	(39,710)	(39,710)	-
FUND BALANCE, beginning of year	39,710	39,710	39,710	-
FUND BALANCE, end of year	$ -	$ -	$ -	$ -

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE (MODIFIED CASH BASIS) - BUDGET AND ACTUAL – AURORA COLONY DAYS FUND YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Licenses and permits	$ 6,500	$ 6,500	$ 4,868	$ (1,632)
Miscellaneous	7,040	7,040	10,250	3,210
Total Revenues	13,540	13,540	15,118	1,578
EXPENDITURES				
Personal services	2,568	2,568	2,339	229
Materials and services	15,900	15,900	11,367	4,533
Contingency	5,072	5,072	-	5,072
Total Expenditures	23,540	23,540	13,706	9,834
REVENUES OVER (UNDER) EXPENDITURES	(10,000)	(10,000)	1,412	11,412
OTHER FINANCING SOURCES (USES)				
Transfers in	10,000	10,000	10,000	-
NET CHANGE IN FUND BALANCE	-	-	11,412	11,412
FUND BALANCE, beginning of year	-	-	-	-
FUND BALANCE, end of year	$ -	$ -	$ 11,412	$ 11,412

CITY OF AURORA, OREGON
COMBINING STATEMENT OF FUND NET POSITION (MODIFIED CASH BASIS) – NONMAJOR ENTERPRISE FUNDS
JUNE 30, 2016

	Water SDC	***Water Reserve***	***Sewer SDC***
ASSETS			
Cash and cash equivalents	$ 112,799	$ 107,049	$ 43,366
LIABILITIES	-	-	-
NET POSITION			
Restricted for:			
Construction	112,799	-	43,366
Unrestricted	-	107,049	-
Total Net Position	$ 112,799	$ 107,049	$ 43,366

Sewer Reserve	*Total*
$ 96,283	$ 359,497
-	-
-	156,165
96,283	203,332
$ 96,283	$ 359,497

CITY OF AURORA, OREGON
COMBINING STATEMENT OF REVENUES, EXPENSES AND CHANGES IN FUND NET POSITION
(MODIFIED CASH BASIS) - NONMAJOR ENTERPRISE FUNDS
YEAR ENDED JUNE 30, 2016

	Water SDC	***Water Reserve***	***Sewer SDC***
OPERATING REVENUES	$ -	$ -	$ -
OPERATING EXPENSES	-	-	-
OPERATING INCOME	-	-	-
NONOPERATING ITEMS			
Intergovernmental	-	-	-
Interest revenue	553	629	215
Capital acquisitions	-	-	-
Total Nonoperating Revenues (Expenses)	553	629	215
NET INCOME BEFORE CONTRIBUTIONS AND TRANSFERS	553	629	215
Capital contributions	49,887	-	18,288
Transfers in	-	59,710	-
CHANGE IN NET POSITION	50,440	60,339	18,503
NET POSITION, beginning of year	62,359	46,710	24,863
NET POSITION, end of year	$ 112,799	$ 107,049	$ 43,366

Sewer Reserve	*Total*
$ -	$ -
-	-
-	-
15,752	15,752
499	1,896
(15,752)	(15,752)
499	1,896
499	1,896
-	68,175
40,000	99,710
40,499	169,781
55,784	189,716
$ 96,283	$ 359,497

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL - WATER FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Charges for services	$ 285,650	$ 285,650	$ 299,160	$ 13,510
Miscellaneous	2,100	2,100	70	(2,030)
Interest earnings	950	950	1,493	543
Total Revenues	288,700	288,700	300,723	12,023
EXPENDITURES				
Personal services	90,812	90,812	79,367	11,445
Materials and services	146,494	146,494	105,589	40,905
Debt service				
Principal	12,640	12,640	12,640	-
Interest	8,252	8,252	8,252	-
Capital outlay	72,870	72,870	50,812	22,058
Contingency	159,132	159,132	-	159,132
Total Expenditures	490,200	490,200	256,660	233,540
REVENUES OVER (UNDER) EXPENDITURES	(201,500)	(201,500)	44,063	245,563
OTHER FINANCING SOURCES (USES)				
Transfers out	(20,000)	(20,000)	(20,000)	-
CHANGE IN FUND BALANCE	(221,500)	(221,500)	24,063	245,563
FUND BALANCE, beginning of year	221,500	221,500	229,615	8,115
FUND BALANCE, end of year	$ -	$ -	$ 253,678	$ 253,678

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL - SEWER FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Charges for services	$ 275,400	$ 275,400	$ 284,709	$ 9,309
Miscellaneous	2,000	2,000	-	(2,000)
Interest earnings	900	900	1,411	511
Total Revenues	278,300	278,300	286,120	7,820
EXPENDITURES				
Personal services	82,093	82,093	66,996	15,097
Materials and services	165,830	178,700	173,480	5,220
Capital outlay	47,870	35,000	30,451	4,549
Contingency	199,507	199,507	-	199,507
Total Expenditures	495,300	495,300	270,927	224,373
REVENUES OVER (UNDER) EXPENDITURES	(217,000)	(217,000)	15,193	232,193
OTHER FINANCING SOURCES (USES)				
Transfers out	(40,000)	(40,000)	(40,000)	-
CHANGE IN FUND BALANCE	(257,000)	(257,000)	(24,807)	232,193
FUND BALANCE, beginning of year	257,000	257,000	256,530	(470)
FUND BALANCE, end of year	$ -	$ -	$ 231,723	$ 231,723

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL – GENERAL OBLIGATION WASTEWATER BOND FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	Final	Actual	Variance
REVENUES				
Taxes and assessments	$ 313,175	$ 313,175	$ 322,394	$ 9,219
Interest earnings	800	800	1,083	283
Total Revenues	313,975	313,975	323,477	9,502
EXPENDITURES				
Debt service				
Principal	215,000	215,000	215,000	-
Interest	107,975	107,975	107,975	-
Total Expenditures	322,975	322,975	322,975	-
CHANGE IN FUND BALANCE	(9,000)	(9,000)	502	9,502
FUND BALANCE, beginning of year	19,000	19,000	21,790	2,790
FUND BALANCE, end of year	$ 10,000	$ 10,000	$ 22,292	$ 12,292

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL – WATER SDC FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	*Final*	*Actual*	*Variance*
REVENUES				
Licenses and permits	$ 20,326	$ 20,326	$ 49,887	$ 29,561
Interest earnings	240	240	553	313
Total Revenues	20,566	20,566	50,440	29,874
EXPENDITURES				
Capital outlay	77,376	77,376	-	77,376
CHANGE IN FUND BALANCE	(56,810)	(56,810)	50,440	107,250
FUND BALANCE, beginning of year	56,810	56,810	62,359	5,549
FUND BALANCE, end of year	$ -	$ -	$ 112,799	$ 112,799

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL – WATER RESERVE FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Interest earnings	$ 100	$ 100	$ 629	$ 529
EXPENDITURES				
Capital outlay	106,510	106,510	-	106,510
REVENUES OVER (UNDER) EXPENDITURES	(106,410)	(106,410)	629	107,039
OTHER FINANCING SOURCES (USES)				
Transfers in	59,710	59,710	59,710	-
CHANGE IN FUND BALANCE	(46,700)	(46,700)	60,339	107,039
FUND BALANCE, beginning of year	46,700	46,700	46,710	10
FUND BALANCE, end of year	$ -	$ -	$ 107,049	$ 107,049

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL – SEWER SDC FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Licenses and permits	$ 6,096	$ 6,096	$ 18,288	$ 12,192
Interest earnings	120	120	215	95
Total Revenues	6,216	6,216	18,503	12,287
EXPENDITURES				
Capital outlay	29,036	29,036	-	29,036
CHANGE IN FUND BALANCE	(22,820)	(22,820)	18,503	41,323
FUND BALANCE, beginning of year	22,820	22,820	24,863	2,043
FUND BALANCE, end of year	$ -	$ -	$ 43,366	$ 43,366

CITY OF AURORA, OREGON

SCHEDULE OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
(MODIFIED CASH BASIS) - BUDGET AND ACTUAL – SEWER RESERVE FUND
YEAR ENDED JUNE 30, 2016

	Budget Amounts			
	Original	***Final***	***Actual***	***Variance***
REVENUES				
Intergovernmental	$ -	$ -	$ 15,752	$ 15,752
Interest earnings	190	190	499	309
Total Revenues	190	190	16,251	16,061
EXPENDITURES				
Capital outlay	95,940	95,940	15,752	80,188
REVENUES OVER (UNDER) EXPENDITURES	(95,750)	(95,750)	499	96,249
OTHER FINANCING SOURCES (USES)				
Transfers in	40,000	40,000	40,000	-
CHANGE IN FUND BALANCE	(55,750)	(55,750)	40,499	96,249
FUND BALANCE, beginning of year	55,750	55,750	55,784	34
FUND BALANCE, end of year	$ -	$ -	$ 96,283	$ 96,283

COMPLIANCE SECTION

GROVE, MUELLER & SWANK, P.C.
CERTIFIED PUBLIC ACCOUNTANTS AND CONSULTANTS
475 Cottage Street NE, Suite 200, Salem, Oregon 97301
(503) 581-7788

INDEPENDENT AUDITOR'S REPORT REQUIRED BY OREGON STATE REGULATIONS

Honorable Mayor and Council Members
City of Aurora
21420 Main Street NE
Aurora, Oregon 97002

We have audited, in accordance with auditing standards generally accepted in the United States of America, the basic financial statements of the City of Aurora, Oregon as of and for the year ended June 30, 2016, and have issued our report thereon dated December 1, 2016.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the City's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grants, including the provisions of Oregon Revised Statutes as specified in Oregon Administrative Rules 162-10-000 through 162-10-320 of the Minimum Standards for Audits of Oregon Municipal Corporations, noncompliance with which could have a direct and material effect on the determination of financial statements amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion.

We performed procedures to the extent we considered necessary to address the required comments and disclosures which included, but were not limited to the following:

- Deposit of public funds with financial institutions (ORS Chapter 295).
- Indebtedness limitations, restrictions and repayment.
- Budgets legally required (ORS Chapter 294).
- Insurance and fidelity bonds in force or required by law.
- Programs funded from outside sources.
- Highway revenues used for public highways, roads, and streets.
- Authorized investment of surplus funds (ORS Chapter 294).
- Public contracts and purchasing (ORS Chapters 279A, 279B, 279C).
- Accountability for collecting or receiving money by elected officials - no money was collected or received by elected officials.

In connection with our testing nothing came to our attention that caused us to believe the City was not in substantial compliance with certain provisions of laws, regulations, contracts, and grants, including the provisions of Oregon Revised Statutes as specified in Oregon Administrative Rules 162-10-000 through 162-10-320 of the Minimum Standards for Audits of Oregon Municipal Corporations.

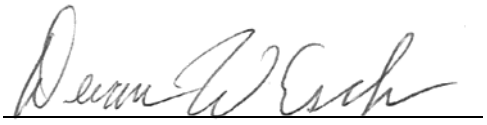
Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered the City's internal control over financial reporting to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the City's internal control. Accordingly, we do not express an opinion on the effectiveness of the City's internal control.

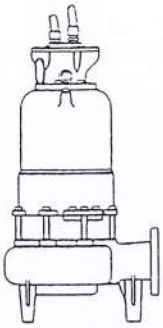
Restriction on Use

This report is intended solely for the information and use of the City Council and management of the City of Aurora, Oregon and the Oregon Secretary of State and is not intended to be and should not be used by anyone other than these parties.

GROVE, MUELLER & SWANK, P.C.
CERTIFIED PUBLIC ACCOUNTANTS

By: 
Devan W. Esch, A Shareholder
December 1, 2016

Appendix E
Lift Station Pump Curves

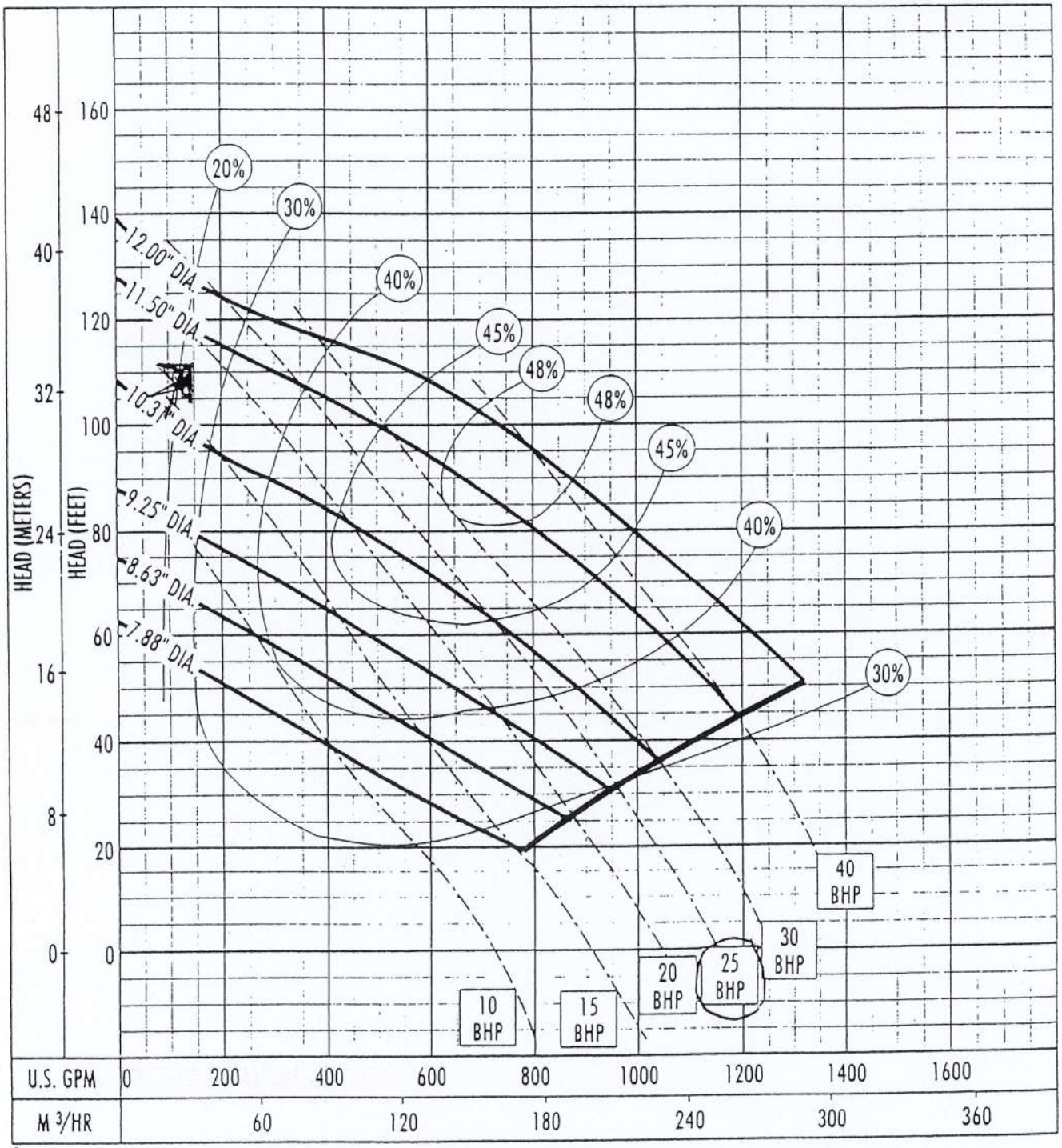


P.S. 1
3φ 460V

Performance Curve

S4LRC/S4LVX

RPM: **1750** Discharge: **4"** Solids: **3-1/4"**

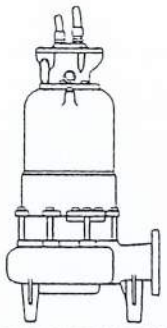


The curves reflect maximum performance characteristics without exceeding full load (Nameplate) horsepower. All pumps have a service factor of 1.2. Operation is recommended in the bounded area with operational point within the curve limit. Performance curves are based on actual tests with clear water at 70° F. and 1280 feet site elevation.

Conditions of Service:

GPM: 140 TDH: 116

HYDROMATIC™ PUMPS

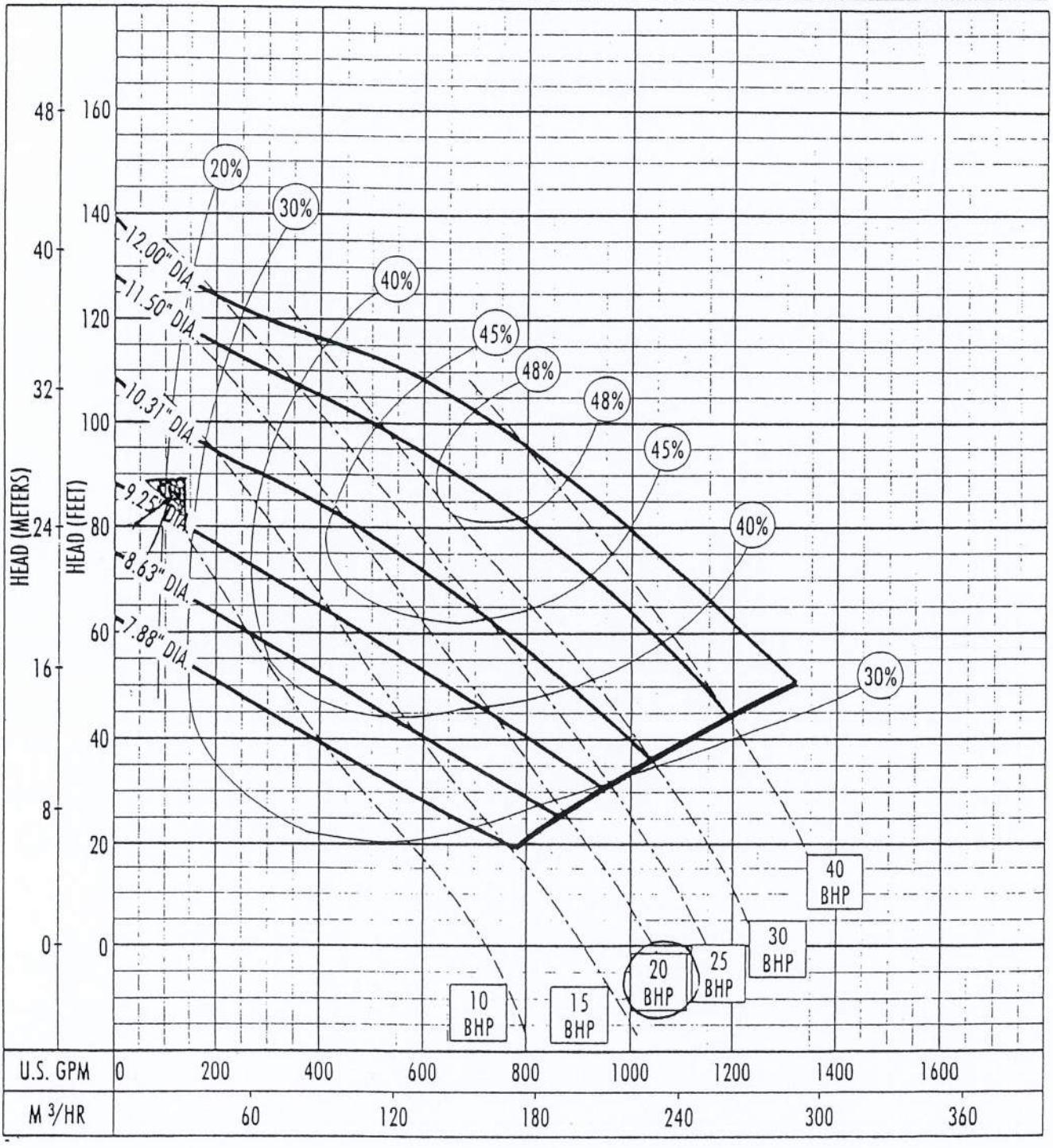


P.S. 2
3φ 460 V.

Performance Curve

S4LRC/S4LVX

RPM: **1750** Discharge: **4"** Solids: **3-1/4"**

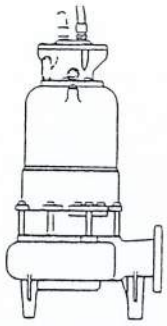


The curves reflect maximum performance characteristics without exceeding full load (Nameplate) horsepower. All pumps have a service factor of 1.2. Operation is recommended in the bounded area with operational point within the curve limit. Performance curves are based on actual tests with clear water at 70° F. and 1280 feet site elevation.

Conditions of Service:

GPM: 140 TDH: 90

HYDROMATIC™ PUMPS

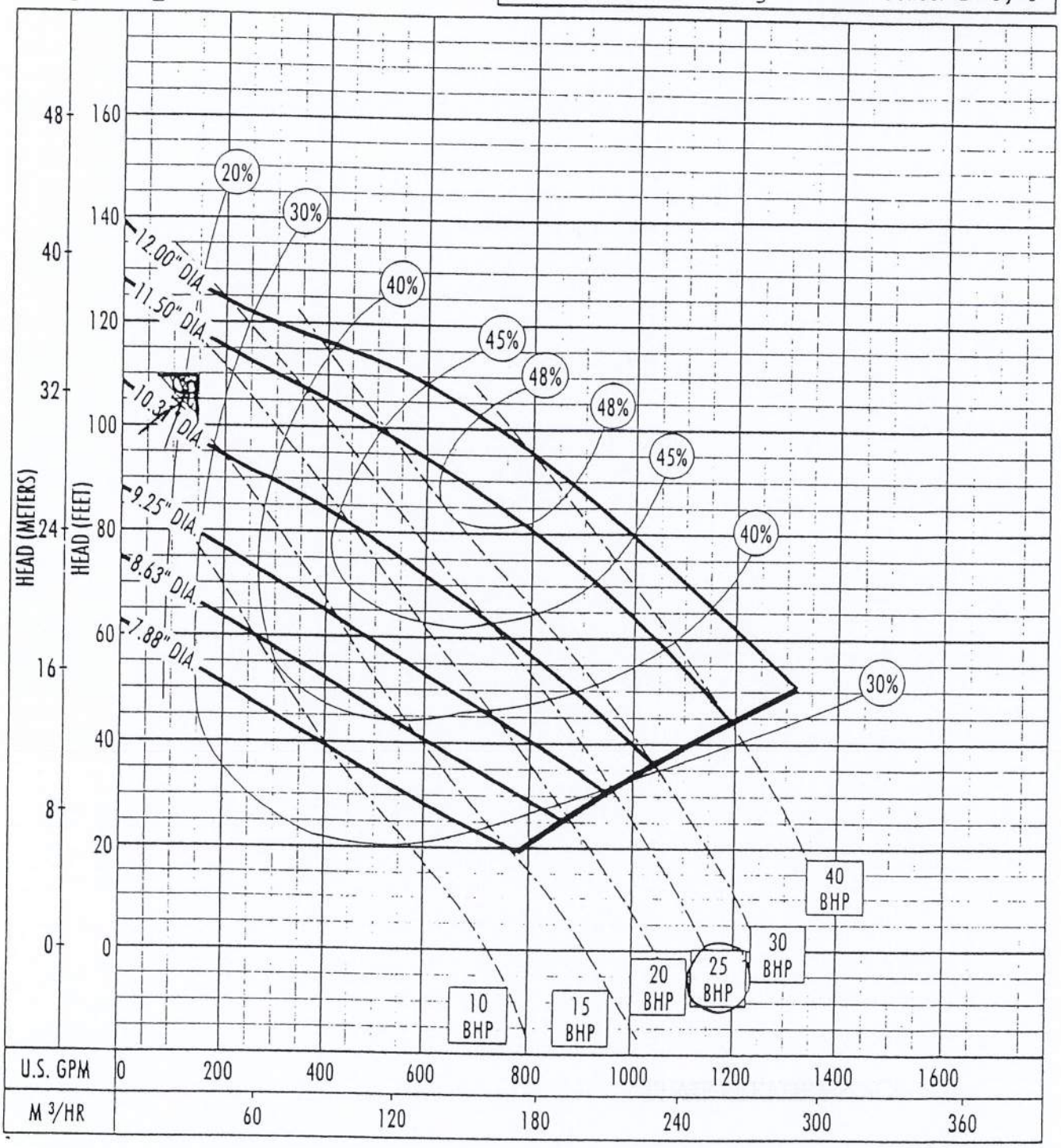


P.S.3
3φ 460V.

Performance Curve

S4LRC/S4LVX

RPM: **1750** Discharge: **4"** Solids: **3-1/4"**



The curves reflect maximum performance characteristics without exceeding full load (Nameplate) horsepower. All pumps have a service factor of 1.2. Operation is recommended in the bounded area with operational point within the curve limit. Performance curves are based on actual tests with clear water at 70° F. and 1280 feet site elevation.

Conditions of Service:

GPM: 140 TDH: 110

HYDROMATIC™ PUMPS

FLYGT

Influent Pump Station

PERFORMANCE CURVE

PRODUCT	TYPE
FP3085.092	LT

DATE	PROJECT	CURVE NO	ISSUE
1999-11-29		63-491-00-5391	1

	1/1-LOAD	3/4-LOAD	1/2-LOAD
ER FACTOR	0.83	0.77	0.66
CIENCY	77.5 %	78.5 %	76.5 %
MOTOR DATA	---	---	---

RATED POWER	3.0	Hp
STARTING CURRENT ...	22	A
RATED CURRENT ...	4.3	A
RATED SPEED	1700	rpm
TOT.MOM.OF INERTIA ...	0.028	kgm2
NO. OF BLADES	2	

IMPELLER DIAMETER: 200 mm

MOTOR #	STATOR	REV
15-10-4AL	12YSER	10

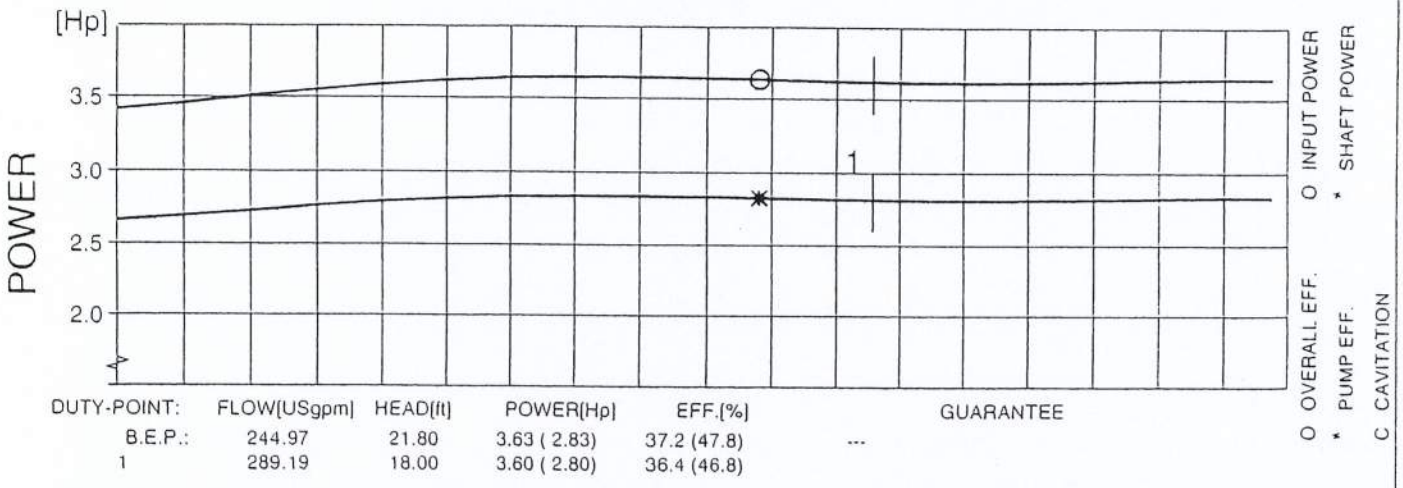
FREQ.	PHASES	VOLTAGE	POLES
60 Hz	3	460 V	4

GEARTYPE	RATIO
---	---

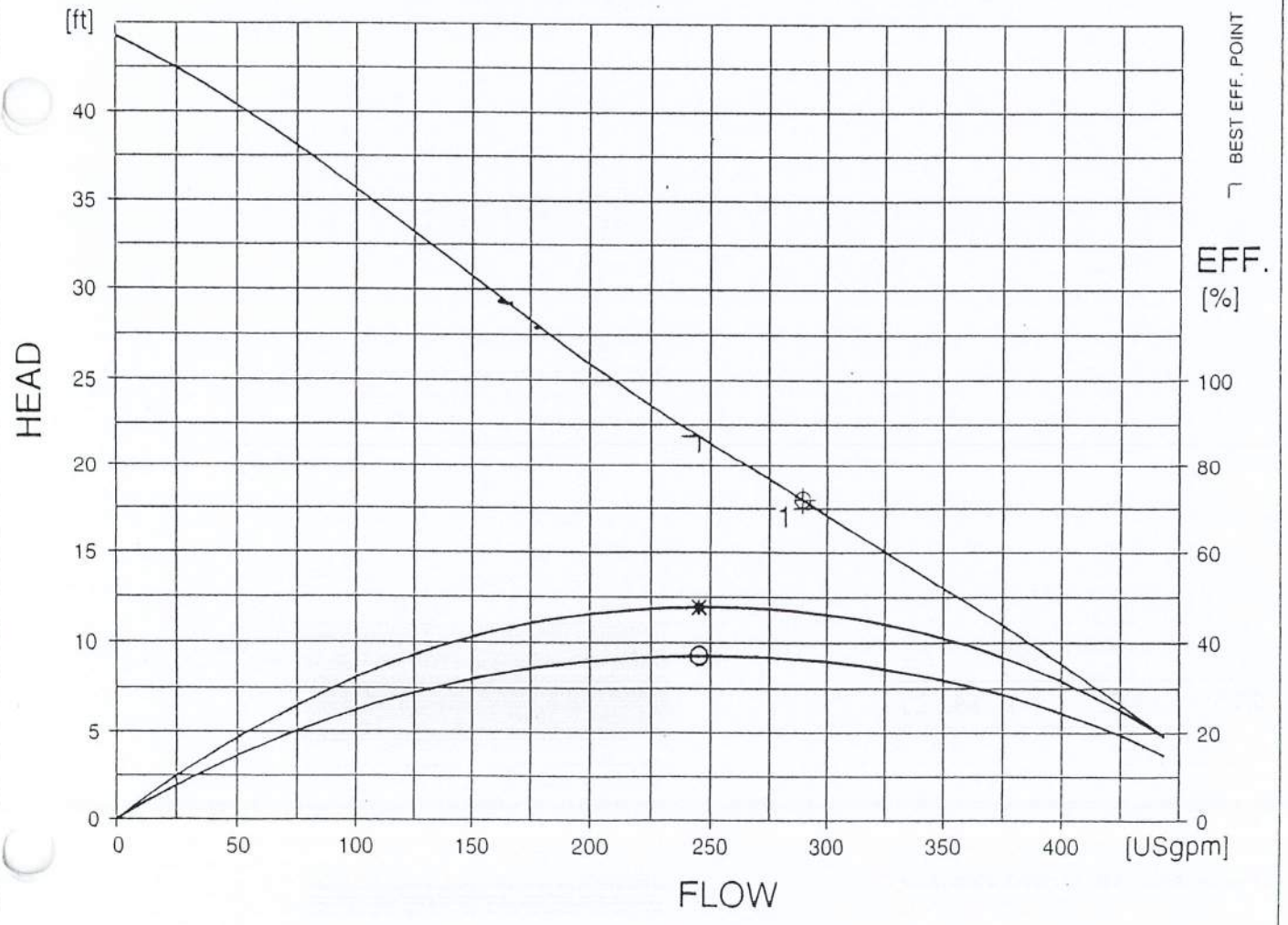
COMMENTS

INLET/OUTLET: - /100 mm

IMP. THROUGHLET: ---



DUTY-POINT:	FLOW[USgpm]	HEAD[ft]	POWER[Hp]	EFF.[%]	GUARANTEE
B.E.P.:	244.97	21.80	3.63 (2.83)	37.2 (47.8)	---
1	289.19	18.00	3.60 (2.80)	36.4 (46.8)	



FLYGT CURVE

Performance with clear water and ambient temp 40 °C

Appendix F
Collection System Model Data

Existing System Flows, PIF5

Input						Output					
Junction ID (Char)	Rim Elev	Invert Elev	Install Year	Avg DWF (gpm)	DWF Pattern	Max Depth (ft)	Max HGL (ft)	Freeboard (ft)	Max Inflow (gpm)	Total Flood Vol (MG)	Time Flooded (hrs)
MH_1	162.48	144.55	1999	0.696	DIURNAL	0.2	144.8	17.7	134.2	0	0.00
MH_10	163.01	150.44	1999	2.226	DIURNAL	0.1	150.6	12.4	50.5	0	0.00
MH_100	140.36	133.52	2005	1.252	DIURNAL	0.1	133.6	6.8	9.7	0	0.00
MH_101	140.92	134.72	2005	1.391	DIURNAL	0.1	134.8	6.1	4.6	0	0.00
MH_102	153.00	145.80	2005	1.113	DIURNAL	0.0	145.8	7.2	5.6	0	0.00
MH_103	152.54	148.94	2005	0.278	DIURNAL	0.0	149.0	3.6	2.0	0	0.00
MH_104	149.44	142.14	2005	0.835	DIURNAL	0.0	142.2	7.3	2.8	0	0.00
MH_105	140.22	135.52	2005	0.000	DIURNAL	0.0	135.5	4.7	0.0	0	0.00
MH_106	159.26	153.46	2005	0.696	DIURNAL	0.0	153.5	5.8	1.3	0	0.00
MH_107	165.26	157.46	2005	0.000	DIURNAL	0.0	157.5	7.8	0.0	0	0.00
MH_108	168.61	163.61	2006	0.000	DIURNAL	0.0	163.6	5.0	0.0	0	0.00
MH_109	168.30	161.31	2006	1.252	DIURNAL	0.0	161.3	7.0	2.3	0	0.00
MH_11	162.55	152.70	1999	1.391	DIURNAL	0.2	152.9	9.7	50.9	0	0.00
MH_110	167.39	160.85	2006	0.000	DIURNAL	0.0	160.9	6.5	0.0	0	0.00
MH_111	162.67	151.97	2006	0.696	DIURNAL	0.0	152.0	10.7	1.3	0	0.00
MH_112	160.53	154.63	2006	0.000	DIURNAL	0.0	154.6	5.9	0.0	0	0.00
MH_113	162.00	153.27	2006	0.835	DIURNAL	0.0	153.3	8.7	1.5	0	0.00
MH_114	161.84	154.24	2006	0.000	DIURNAL	0.0	154.2	7.6	0.0	0	0.00
MH_115	173.10	165.31	2002	0.557	DIURNAL	0.1	165.4	7.7	8.2	0	0.00
MH_116	172.40	166.13	2002	0.417	DIURNAL	0.1	166.2	6.2	7.2	0	0.00
MH_117	172.40	167.10	2002	2.922	DIURNAL	0.1	167.2	5.2	6.4	0	0.00
MH_118	175.00	168.18	2002	0.557	DIURNAL	0.0	168.2	6.8	1.0	0	0.00
MH_119	173.60	169.00	2002	0.000	DIURNAL	0.0	169.0	4.6	0.0	0	0.00
MH_12	164.00	154.97	1999	0.139	DIURNAL	0.1	155.1	8.9	66.8	0	0.00
MH_120	170.40	167.90	2002	0.000	DIURNAL	0.0	167.9	2.5	0.0	0	0.00
MH_121	175.20	170.39	2002	0.000	DIURNAL	0.0	170.4	4.8	0.0	0	0.00
MH_122	113.26	104.71	2004	0.000	DIURNAL	0.0	104.7	8.6	0.0	0	0.00
MH_123	178.86	173.76	2005	0.000	DIURNAL	0.0	173.8	5.1	0.0	0	0.00
MH_124	176.93	169.03	2005	0.000	DIURNAL	0.0	169.0	7.9	0.0	0	0.00
MH_125	129.00	127.10	unknown	0.000	DIURNAL	0.1	127.2	1.8	19.7	0	0.00
MH_126	130.00	121.58	unknown	0.278	DIURNAL	0.1	121.6	8.4	26.9	0	0.00
MH_13	163.06	156.15	1999	0.278	DIURNAL	0.2	156.3	6.7	164.0	0	0.00
MH_14	168.00	159.00	1999	0.835	DIURNAL	0.0	159.0	9.0	4.4	0	0.00
MH_15	170.00	162.12	1999	1.531	DIURNAL	0.0	162.2	7.8	2.8	0	0.00
MH_16	172.00	165.25	1999	0.000	DIURNAL	0.0	165.3	6.8	0.0	0	0.00
MH_17	172.00	165.30	1999	0.000	DIURNAL	0.0	165.3	6.7	0.0	0	0.00
MH_18	172.00	161.48	1999	0.974	DIURNAL	0.2	161.7	10.3	160.1	0	0.00
MH_19	173.57	163.21	1999	1.252	DIURNAL	0.1	163.3	10.3	18.2	0	0.00
MH_2	166.69	157.40	1999	0.417	DIURNAL	0.1	157.5	9.2	83.2	0	0.00
MH_20	174.00	164.20	1999	0.974	DIURNAL	0.1	164.3	9.7	10.0	0	0.00
MH_22	173.83	166.54	1999	1.948	DIURNAL	0.1	166.6	7.2	5.9	0	0.00
MH_23	176.00	167.71	1999	1.252	DIURNAL	0.0	167.8	8.2	2.3	0	0.00
MH_24	170.01	163.10	1999	2.365	DIURNAL	0.0	163.1	6.9	4.4	0	0.00
MH_25	172.28	165.55	1999	0.000	DIURNAL	0.0	165.6	6.7	0.0	0	0.00
MH_26	168.21	154.65	1999	0.974	DIURNAL	0.0	154.7	13.5	5.1	0	0.00
MH_27	168.00	158.00	1999	0.557	DIURNAL	0.2	158.2	9.8	3.3	0	0.00
MH_28	168.00	161.38	1999	1.252	DIURNAL	0.0	161.4	6.6	2.3	0	0.00

Existing System Flows, PIF5

Input						Output					
Junction ID (Char)	Rim Elev	Invert Elev	Install Year	Avg DWF (gpm)	DWF Pattern	Max Depth (ft)	Max HGL (ft)	Freeboard (ft)	Max Inflow (gpm)	Total Flood Vol (MG)	Time Flooded (hrs)
MH_29	171.36	164.65	1999	0.000	DIURNAL	0.0	164.7	6.7	0.0	0	0.00
MH_3	170.76	158.97	1999	0.835	DIURNAL	0.2	159.1	11.6	92.6	0	0.00
MH_30	172.00	162.00	1999	0.000	DIURNAL	0.0	162.0	10.0	0.0	0	0.00
MH_31	161.73	152.50	1999	0.139	DIURNAL	0.0	152.5	9.2	5.4	0	0.00
MH_32	144.98	136.80	1999	0.696	DIURNAL	0.0	136.8	8.1	6.7	0	0.00
MH_33	126.08	118.00	1999	0.000	DIURNAL	0.1	118.1	8.0	26.9	0	0.00
MH_34	118.00	110.26	1999	1.113	DIURNAL	0.1	110.3	7.7	28.9	0	0.00
MH_35	111.50	103.87	1999	0.557	DIURNAL	0.1	104.0	7.5	30.0	0	0.00
MH_36	110.00	101.95	1999	0.557	DIURNAL	0.1	102.1	7.9	31.0	0	0.00
MH_37	110.80	100.53	1999	0.835	DIURNAL	0.1	100.6	10.2	32.5	0	0.00
MH_38	111.10	98.63	1999	0.974	DIURNAL	0.1	98.8	12.3	46.8	0	0.00
MH_39	117.34	110.40	1999	0.835	DIURNAL	0.0	110.4	6.9	12.5	0	0.00
MH_4	174.00	166.05	1999	0.417	DIURNAL	0.0	166.1	7.9	4.1	0	0.00
MH_40	134.55	124.10	1999	0.835	DIURNAL	0.0	124.1	10.4	11.0	0	0.00
MH_41	154.37	144.40	1999	0.417	DIURNAL	0.0	144.4	9.9	9.5	0	0.00
MH_42	160.29	147.45	1999	1.252	DIURNAL	0.1	147.5	12.8	8.7	0	0.00
MH_43	160.96	150.60	1999	0.696	DIURNAL	0.1	150.7	10.3	6.4	0	0.00
MH_44	160.65	152.70	1999	0.835	DIURNAL	0.0	152.7	7.9	1.5	0	0.00
MH_45	164.12	154.80	1999	0.000	DIURNAL	0.0	154.8	9.3	0.0	0	0.00
MH_46	168.89	157.40	1999	1.948	DIURNAL	0.0	157.4	11.5	3.6	0	0.00
MH_47	170.64	163.90	1999	0.000	DIURNAL	0.0	163.9	6.7	0.0	0	0.00
MH_48	168.32	161.60	1999	0.000	DIURNAL	0.0	161.6	6.7	0.0	0	0.00
MH_49	167.34	160.85	1999	0.000	DIURNAL	0.0	160.9	6.5	0.0	0	0.00
MH_5	175.24	167.45	1999	0.417	DIURNAL	0.0	167.5	7.8	3.3	0	0.00
MH_50	166.00	158.00	1999	0.000	DIURNAL	0.0	158.0	8.0	0.0	0	0.00
MH_51	162.70	155.00	1999	1.252	DIURNAL	0.0	155.0	7.7	2.3	0	0.00
MH_52	159.19	151.75	1999	1.531	DIURNAL	0.0	151.8	7.4	5.1	0	0.00
MH_53	136.69	123.95	1999	1.809	DIURNAL	0.0	124.0	12.7	8.4	0	0.00
MH_54	122.48	111.00	1999	1.113	DIURNAL	0.1	111.1	11.4	18.4	0	0.00
MH_55	128.54	118.00	1999	0.278	DIURNAL	0.0	118.0	10.5	7.9	0	0.00
MH_56	130.03	122.00	1999	0.557	DIURNAL	0.0	122.0	8.0	7.4	0	0.00
MH_57	111.39	104.50	1999	0.417	DIURNAL	0.1	104.6	6.8	19.2	0	0.00
MH_58	133.11	126.40	1999	0.000	DIURNAL	0.0	126.4	6.7	0.0	0	0.00
MH_59	163.34	156.60	1999	0.000	DIURNAL	0.0	156.6	6.7	0.0	0	0.00
MH_6	176.09	169.20	1999	0.417	DIURNAL	0.0	169.2	6.9	2.6	0	0.00
MH_60	167.54	160.65	1999	0.000	DIURNAL	0.0	160.7	6.9	0.0	0	0.00
MH_61	157.10	150.00	1999	0.835	DIURNAL	0.0	150.0	7.1	3.8	0	0.00
MH_62	164.56	157.65	1999	0.696	DIURNAL	0.0	157.7	6.9	1.3	0	0.00
MH_63	168.00	161.30	1999	0.000	DIURNAL	0.0	161.3	6.7	0.0	0	0.00
MH_64	152.58	142.60	1999	0.000	DIURNAL	0.0	142.6	10.0	0.0	0	0.00
MH_65	160.40	153.50	1999	0.557	DIURNAL	0.0	153.5	6.9	1.0	0	0.00
MH_66	162.55	155.85	1999	0.000	DIURNAL	0.0	155.9	6.7	0.0	0	0.00
MH_67	145.20	138.00	1999	1.391	DIURNAL	0.0	138.0	7.2	6.4	0	0.00
MH_68	104.00	94.80	1999	0.139	DIURNAL	0.1	94.9	9.1	14.6	0	0.00
MH_69	106.38	99.00	1999	0.000	DIURNAL	0.1	99.1	7.3	14.3	0	0.00
MH_7	178.33	171.00	1999	0.974	DIURNAL	0.0	171.0	7.3	1.8	0	0.00
MH_70	119.14	112.00	1999	0.557	DIURNAL	0.0	112.0	7.1	1.0	0	0.00

Existing System Flows, PIF5

Input						Output					
Junction ID (Char)	Rim Elev	Invert Elev	Install Year	Avg DWF (gpm)	DWF Pattern	Max Depth (ft)	Max HGL (ft)	Freeboard (ft)	Max Inflow (gpm)	Total Flood Vol (MG)	Time Flooded (hrs)
MH_71	131.64	124.70	1999	0.000	DIURNAL	0.0	124.7	6.9	0.0	0	0.00
MH_72	104.19	97.35	1999	0.000	DIURNAL	0.0	97.4	6.8	0.0	0	0.00
MH_73	110.87	103.00	1999	0.417	DIURNAL	0.1	103.1	7.8	13.3	0	0.00
MH_74	129.34	122.40	1999	0.278	DIURNAL	0.0	122.4	6.9	12.5	0	0.00
MH_75	138.59	131.65	1999	0.417	DIURNAL	0.0	131.7	6.9	12.0	0	0.00
MH_77	151.51	143.30	1999	0.139	DIURNAL	0.0	143.3	8.2	11.3	0	0.00
MH_78	156.40	149.50	1999	1.113	DIURNAL	0.0	149.5	6.9	6.4	0	0.00
MH_79	166.84	159.90	1999	0.139	DIURNAL	0.0	159.9	6.9	2.0	0	0.00
MH_8	160.53	146.36	1999	0.417	DIURNAL	0.1	146.5	14.0	49.0	0	0.00
MH_80	178.23	163.60	1999	0.835	DIURNAL	0.0	163.6	14.6	1.8	0	0.00
MH_81	173.88	167.20	1999	0.139	DIURNAL	0.0	167.2	6.7	0.3	0	0.00
MH_82	158.30	150.50	1999	0.835	DIURNAL	0.0	150.5	7.8	4.6	0	0.00
MH_88	163.11	154.00	1999	0.278	DIURNAL	0.0	154.0	9.1	3.1	0	0.00
MH_89	169.52	161.00	1999	0.139	DIURNAL	0.0	161.0	8.5	2.6	0	0.00
MH_9	162.00	148.48	1999	0.417	DIURNAL	0.1	148.6	13.4	49.4	0	0.00
MH_90	180.00	167.95	1999	0.278	DIURNAL	0.0	168.0	12.0	2.3	0	0.00
MH_91	179.44	169.25	1999	0.278	DIURNAL	0.0	169.3	10.2	1.8	0	0.00
MH_92	177.56	170.65	1999	0.557	DIURNAL	0.0	170.7	6.9	1.3	0	0.00
MH_93	179.64	172.65	1999	0.139	DIURNAL	0.0	172.7	7.0	0.3	0	0.00
MH_94	154.23	150.00	1999	1.252	DIURNAL	0.0	150.0	4.2	2.3	0	0.00
MH_95	158.07	151.20	1999	1.252	DIURNAL	0.0	151.2	6.8	2.3	0	0.00
MH_96	170.19	163.40	1999	0.000	DIURNAL	0.0	163.4	6.8	0.0	0	0.00
MH_97	154.81	145.91	2005	0.000	DIURNAL	0.0	145.9	8.9	0.0	0	0.00
MH_98	145.84	131.29	2005	1.391	DIURNAL	0.1	131.4	14.5	19.7	0	0.00
MH_99	142.99	130.52	2005	0.974	DIURNAL	1.9	132.4	10.6	17.2	0	0.00

Existing System Flows, PIF5

Input								Output					
Pipe ID	Upstream MH	Downstream MH	Length (ft)	Roughness	US Invert	DS Invert	Diameter (ft)	Full Flow (gpm)	Slope (%)	Max Flow (gpm)	Max Velocity (ft/s)	Max.Flow/Full Flow	Max.Depth/Full Depth
GM_1	MH_1	LS4	93.2	0.012	144.55	144.00	0.83	818.275	0.59	132.07	2.454	0.161	0.272
GM_10	MH_10	MH_9	314.0	0.012	150.44	148.68	0.83	797.593	0.56	48.69	1.803	0.061	0.167
GM_100	MH_104	MH_100	223.6	0.012	142.14	133.62	0.67	1,147.39	3.81	2.82	1.533	0.002	0.037
GM_101	MH_100	MH_99	274.0	0.012	133.52	132.42	0.67	372.292	0.40	9.73	1.081	0.026	0.107
GM_102	MH_101	MH_100	268.8	0.012	134.72	133.62	0.67	375.88	0.41	4.61	0.88	0.012	0.074
GM_103	MH_105	MH_101	91.0	0.012	135.52	135.02	0.67	435.66	0.55	0.00	0	0	0
GM_104	MH_103	MH_101	229.8	0.012	148.94	135.02	0.67	1,447.36	6.07	2.05	1.632	0.001	0.028
GM_105	MH_107	MH_106	254.0	0.012	157.46	153.56	0.67	728.118	1.54	0.00	0	0	0
GM_106	MH_106	MH_102	150.9	0.012	153.46	145.90	0.67	1,316.16	5.02	1.28	1.326	0.001	0.024
GM_107	MH_108	MH_109	410.0	0.012	163.61	161.41	0.67	430.411	0.54	0.00	0	0	0
GM_108	MH_109	MH_102	258.0	0.012	161.31	145.90	0.67	1,437.28	5.98	2.30	1.683	0.002	0.03
GM_109	MH_110	MH_111	194.0	0.012	160.85	152.07	0.67	1,250.63	4.53	0.00	0	0	0
GM_11	MH_11	MH_10	376.9	0.012	152.74	150.64	0.83	795.174	0.56	46.37	1.773	0.058	0.164
GM_110	MH_111	MH_104	269.0	0.012	151.97	142.10	0.67	1,123.59	3.66	1.28	0.892	0.001	0.031
GM_111	MH_112	MH_113	148.0	0.012	154.63	153.47	0.67	520.194	0.78	0.00	0	0	0
GM_112	MH_113	MH_103	256.0	0.012	153.27	149.00	0.67	758.901	1.67	1.54	0.955	0.002	0.033
GM_113	MH_115	MH_20	212.5	0.012	165.31	164.30	0.67	405.083	0.48	8.19	1.075	0.02	0.095
GM_114	MH_116	MH_115	89.8	0.012	166.13	165.41	0.67	526.174	0.80	7.17	1.184	0.014	0.082
GM_115	MH_117	MH_116	145.5	0.012	167.10	166.23	0.67	454.352	0.60	6.40	1.051	0.014	0.082
GM_116	MH_118	MH_117	130.0	0.012	168.18	167.30	0.67	483.432	0.68	1.03	0.717	0.002	0.031
GM_117	MH_119	MH_23	234.9	0.012	169.00	167.91	0.67	400.253	0.46	0.00	0	0	0
GM_118	MH_120	MH_117	120.9	0.012	167.90	167.30	0.67	413.929	0.50	0.00	0	0	0
GM_119	MH_121	MH_117	498.8	0.012	170.39	167.30	0.67	462.467	0.62	0.00	0	0	0
GM_12	MH_12	MH_11	348.3	0.012	154.97	152.94	0.83	813.283	0.58	48.33	1.824	0.059	0.165
GM_120	MH_122	MH_35	213.3	0.012	104.71	103.86	0.67	368.763	0.39	0.00	0	0	0.082
GM_121	MH_123	MH_7	378.7	0.012	173.76	171.10	0.67	492.447	0.70	0.00	0	0	0
GM_122	MH_124	MH_118	142.2	0.012	169.03	168.83	0.67	220.372	0.14	0.00	0	0	0
GM_123	MH_98	MH_125	455.3	0.012	131.29	127.20	0.67	556.881	0.90	19.71	1.672	0.035	0.129
GM_124	MH_125	MH_126	316.0	0.012	127.10	125.52	0.67	415.478	0.50	19.71	1.399	0.047	0.145
GM_125	MH_64	MH_32	401.5	0.012	142.60	137.00	0.67	693.975	1.40	0.00	0	0	0
GM_126	MH_114	MH_113	152.6	0.012	154.24	153.47	0.67	417.405	0.51	0.00	0	0	0
GM_127	LS4_PUMP	LS4_BREAK	1639.8	0.012	153.00	149.20	0.50	154.289	0.23	147.35	1.746	0.955	0.913
GM_13	MH_13	MH_12	182.9	0.012	156.15	155.17	0.83	779.783	0.54	66.53	1.946	0.085	0.197
GM_14	MH_14	MH_13	207.0	0.012	159.00	156.35	0.67	664.807	1.28	4.35	1.197	0.007	0.058
GM_15	MH_15	MH_14	390.0	0.012	162.12	159.20	0.67	508.418	0.75	2.82	0.895	0.006	0.052
GM_16	MH_16	MH_15	390.0	0.012	165.25	162.32	0.67	509.287	0.75	0.00	0	0	0
GM_17	MH_17	MH_10	300.0	0.012	165.30	156.30	0.67	1,017.88	3.00	0.00	0	0	0
GM_18	MH_18	MH_3	308.0	0.012	161.48	159.17	0.67	508.851	0.75	82.59	2.39	0.162	0.272
GM_19	MH_19	MH_18	205.0	0.012	163.21	161.68	0.67	507.616	0.75	18.18	1.529	0.036	0.129
GM_2	MH_2	MH_1	225.3	0.012	157.40	146.00	0.83	2,397.98	5.07	81.94	4.559	0.034	0.126
GM_20	MH_20	MH_19	335.0	0.012	164.20	163.41	0.67	285.329	0.24	9.99	0.917	0.035	0.122
GM_22	MH_22	MH_19	115.0	0.012	166.54	165.67	0.67	511.045	0.76	5.89	1.092	0.012	0.075
GM_23	MH_23	MH_22	335.0	0.012	167.71	166.74	0.67	316.169	0.29	2.30	0.635	0.007	0.058
GM_24	MH_24	MH_3	300.0	0.012	163.10	160.85	0.67	508.851	0.75	4.35	1.012	0.009	0.065
GM_25	MH_25	MH_24	270.0	0.012	165.55	163.30	0.67	536.377	0.83	0.00	0	0	0
GM_26	MH_27	MH_26	415.0	0.012	158.20	154.85	0.67	527.911	0.81	3.33	0.958	0.006	0.056
GM_27	MH_28	MH_27	420.0	0.012	161.38	158.20	0.67	511.271	0.76	2.30	0.729	0.005	0.053
GM_28	MH_29	MH_28	410.0	0.012	164.65	161.58	0.67	508.439	0.75	0.00	0	0	0
GM_3	MH_3	MH_2	231.0	0.012	158.97	157.60	0.83	820.365	0.59	82.45	2.146	0.1	0.214
GM_30	MH_30	MH_26	235.1	0.012	162.00	154.85	0.67	1,024.89	3.04	0.00	0	0	0
GM_31	MH_26	MH_31	258.0	0.012	154.65	152.70	0.67	510.818	0.76	5.12	1.051	0.01	0.07
GM_32	MH_31	MH_32	258.6	0.012	152.50	137.00	0.67	1,439.83	6.01	5.38	2.173	0.004	0.044
GM_33_1	MH_32	MH_126	326.0	0.012	136.80	121.58	0.67	1,270.27	4.67	6.66	1.214	0.005	0.076
GM_33_2	MH_126	MH_33	72.0	0.012	121.58	118.20	0.67	1,273.77	4.70	26.88	3.284	0.021	0.1

Existing System Flows, PIF5

Input								Output					
Pipe ID	Upstream MH	Downstream MH	Length (ft)	Roughness	US Invert	DS Invert	Diameter (ft)	Full Flow (gpm)	Slope (%)	Max Flow (gpm)	Max Velocity (ft/s)	Max.Flow/Full Flow	Max.Depth/Full Depth
GM_34	MH_33	MH_34	256.9	0.012	118.00	110.46	0.67	1,006.83	2.94	26.88	2.772	0.027	0.112
GM_35	MH_34	MH_35	235.1	0.012	110.26	104.07	0.67	953.596	2.63	28.93	2.737	0.03	0.119
GM_36	MH_35	MH_36	228.5	0.012	103.87	102.15	0.67	509.753	0.75	29.95	1.78	0.059	0.164
GM_37	MH_36	MH_37	163.0	0.012	101.95	100.73	0.67	508.401	0.75	30.98	1.795	0.061	0.167
GM_38	MH_37	MH_38	213.3	0.012	100.53	98.83	0.67	524.525	0.80	32.51	1.861	0.062	0.169
GM_39	MH_39	MH_38	187.5	0.012	110.40	98.83	0.67	1,460.97	6.18	12.55	2.851	0.009	0.066
GM_4	MH_4	MH_3	235.1	0.012	166.05	159.17	0.83	1,822.84	2.93	4.09	1.517	0.002	0.035
GM_40	MH_40	MH_39	400.2	0.012	124.10	110.60	0.67	1,079.44	3.38	11.01	2.219	0.01	0.071
GM_41	MH_41	MH_40	279.7	0.012	144.40	124.30	0.67	1,577.10	7.20	9.47	2.757	0.006	0.055
GM_42	MH_42	MH_41	278.9	0.012	147.45	144.60	0.67	593.946	1.02	8.71	1.365	0.015	0.085
GM_43	MH_43	MH_42	395.0	0.012	150.60	147.65	0.67	507.778	0.75	6.40	1.117	0.013	0.079
GM_44	MH_44	MH_43	250.0	0.012	152.70	150.80	0.67	512.23	0.76	1.54	0.745	0.003	0.04
GM_45	MH_45	MH_44	255.0	0.012	154.80	152.90	0.67	507.183	0.75	0.00	0	0	0
GM_46	MH_46	MH_43	250.0	0.012	157.40	154.25	0.67	659.547	1.26	3.58	1.117	0.005	0.053
GM_47	MH_47	MH_46	150.1	0.012	163.90	157.60	0.67	1,204.17	4.20	0.00	0	0	0
GM_48	MH_48	MH_46	400.0	0.012	161.60	158.60	0.67	508.853	0.75	0.00	0	0	0
GM_49	MH_49	MH_46	430.0	0.012	160.85	157.60	0.67	510.822	0.76	0.00	0	0	0
GM_5	MH_5	MH_4	210.0	0.012	167.45	166.25	0.83	805.325	0.57	3.33	0.84	0.004	0.045
GM_50	MH_50	MH_51	220.0	0.012	158.00	155.20	0.67	662.867	1.27	0.00	0	0	0
GM_51	MH_51	MH_52	403.3	0.012	155.00	151.95	0.67	510.96	0.76	2.30	0.842	0.005	0.047
GM_52	MH_52	MH_53	437.0	0.012	151.75	124.15	0.67	1,478.13	6.33	5.12	2.184	0.003	0.043
GM_53	MH_53	MH_54	385.7	0.012	123.95	111.20	0.67	1,068.60	3.31	8.45	2.036	0.008	0.063
GM_54	MH_55	MH_54	274.1	0.012	118.00	111.20	0.67	925.694	2.48	7.94	1.806	0.009	0.066
GM_55	MH_56	MH_55	158.1	0.012	122.00	118.20	0.67	911.209	2.41	7.43	1.752	0.008	0.064
GM_56	MH_67	MH_56	284.6	0.012	138.00	122.20	0.67	1,385.55	5.56	6.40	2.228	0.005	0.049
GM_57	MH_54	MH_57	275.7	0.012	111.00	104.70	0.67	888.288	2.29	18.44	2.28	0.021	0.099
GM_58	MH_58	MH_53	300.0	0.012	126.40	124.15	0.67	508.851	0.75	0.00	0	0	0
GM_59	MH_59	MH_52	220.5	0.012	156.60	151.95	0.67	853.436	2.11	0.00	0	0	0
GM_6	MH_6	MH_5	275.0	0.012	169.20	167.65	0.83	799.815	0.56	2.56	0.79	0.003	0.04
GM_60	MH_60	MH_51	358.0	0.012	160.65	156.00	0.67	669.647	1.30	0.00	0	0	0
GM_61	MH_62	MH_61	237.1	0.012	157.65	150.20	0.67	1,041.75	3.14	1.28	1.126	0.001	0.026
GM_62	MH_63	MH_62	215.0	0.012	161.30	157.85	0.67	744.301	1.61	0.00	0	0	0
GM_64	MH_65	MH_61	230.0	0.012	153.50	150.20	0.67	703.813	1.44	1.03	0.851	0.001	0.027
GM_65	MH_66	MH_65	230.0	0.012	155.85	153.70	0.67	568.089	0.94	0.00	0	0	0
GM_67	MH_61	MH_67	281.8	0.012	150.00	138.20	0.67	1,202.99	4.19	3.84	1.739	0.003	0.041
GM_68	MH_69	MH_68	122.1	0.012	99.00	95.00	0.67	1,063.91	3.28	14.33	2.387	0.013	0.081
GM_69	MH_70	MH_69	267.8	0.012	112.00	99.20	0.67	1,285.29	4.79	1.03	1.221	0.001	0.022
GM_7	MH_7	MH_6	285.0	0.012	171.00	169.43	0.83	790.71	0.55	1.79	0.777	0.002	0.032
GM_70	MH_71	MH_70	267.8	0.012	124.70	112.20	0.67	1,270.15	4.67	0.00	0	0	0
GM_72	MH_72	MH_68	338.0	0.012	97.35	95.00	0.67	489.931	0.70	0.00	0	0	0
GM_73	MH_73	MH_69	179.2	0.012	103.00	99.20	0.67	855.745	2.12	13.31	2.005	0.016	0.087
GM_74	MH_74	MH_73	367.5	0.012	122.40	103.20	0.67	1,343.94	5.23	12.54	2.688	0.009	0.068
GM_75	MH_75	MH_74	184.2	0.012	131.65	122.60	0.67	1,303.10	4.92	12.03	2.598	0.009	0.068
GM_76	MH_77	MH_75	275.2	0.012	143.30	131.85	0.67	1,198.94	4.16	11.26	2.403	0.009	0.068
GM_77	MH_78	MH_77	103.2	0.012	149.50	143.50	0.67	1,418.17	5.83	6.40	2.264	0.005	0.048
GM_78	MH_79	MH_78	207.5	0.012	159.90	149.70	0.67	1,303.48	4.92	2.05	1.517	0.002	0.03
GM_79	MH_80	MH_79	310.3	0.012	163.60	160.10	0.67	624.028	1.13	1.79	0.875	0.003	0.039
GM_8	MH_8	MH_1	288.0	0.012	146.36	144.55	0.83	844.566	0.63	48.79	1.264	0.058	0.217
GM_81	MH_81	MH_80	455.0	0.012	167.20	163.80	0.67	507.921	0.75	0.26	0	0.001	0.013
GM_87	MH_82	MH_77	240.1	0.012	150.50	143.50	0.67	1,003.47	2.92	4.61	1.611	0.005	0.049
GM_88	MH_88	MH_82	238.0	0.012	154.00	150.70	0.67	691.882	1.39	3.07	1.099	0.004	0.048
GM_89	MH_89	MH_88	129.7	0.012	161.00	154.20	0.67	1,346.41	5.25	2.56	1.662	0.002	0.032
GM_9	MH_9	MH_8	343.0	0.012	148.48	146.56	0.83	797.053	0.56	48.25	1.797	0.061	0.167
GM_90	MH_90	MH_89	139.2	0.012	167.95	161.20	0.67	1,294.83	4.86	2.30	1.566	0.002	0.031

Existing System Flows, PIF5

Input								Output					
Pipe ID	**Upstream MH**	**Downstream MH**	**Length (ft)**	**Roughness**	**US Invert**	**DS Invert**	**Diameter (ft)**	**Full Flow (gpm)**	**Slope (%)**	**Max Flow (gpm)**	**Max Velocity (ft/s)**	**Max.Flow/Full Flow**	**Max.Depth/Full Depth**
GM_91	MH_91	MH_90	146.0	0.012	169.25	168.15	0.67	510.02	0.75	1.79	0.773	0.004	0.043
GM_92	MH_92	MH_91	160.0	0.012	170.65	169.45	0.67	508.859	0.75	1.28	0.741	0.003	0.035
GM_93	MH_93	MH_92	150.0	0.012	172.65	170.85	0.67	643.654	1.20	0.26	0	0	0.012
GM_94	MH_94	MH_78	50.0	0.012	150.00	149.70	0.67	455.135	0.60	2.30	0.797	0.005	0.049
GM_95	MH_95	MH_1	214.0	0.012	151.20	149.60	0.67	508.054	0.75	2.30	0.839	0.005	0.047
GM_96	MH_96	MH_95	370.2	0.012	163.40	151.40	0.67	1,058.17	3.24	0.00	0	0	0
GM_97	MH_97	MH_98	262.0	0.012	145.91	131.44	0.67	1,381.90	5.53	0.00	0	0	0
GM_98	MH_99	MH_98	147.9	0.012	132.32	131.44	0.67	453.218	0.60	17.15	1.397	0.038	0.132
GM_99	MH_102	MH_99	231.4	0.012	145.80	132.42	0.67	1,414.07	5.79	5.63	2.175	0.004	0.046

20-Year Flows, WWF (PIF5)

Input						Output					
Junction ID (Char)	Rim Elev	Invert Elev	Install Year	Avg DWF (gpm)	DWF Pattern	Max Depth (ft)	Max HGL (ft)	Freeboard (ft)	Max Inflow (gpm)	Total Flood Vol (MG)	Time Flooded (hrs)
MH_1	162.48	144.55	1999	0.822	DIURNAL	0.2	144.7	17.7	100.0	0	0.00
MH_10	163.01	150.44	1999	2.222	DIURNAL	0.2	150.6	12.4	81.4	0	0.00
MH_100	140.36	133.52	2005	1.250	DIURNAL	0.1	133.6	6.8	5.9	0	0.00
MH_101	140.92	134.72	2005	1.389	DIURNAL	0.0	134.8	6.2	2.8	0	0.00
MH_102	153.00	145.80	2005	1.111	DIURNAL	0.0	145.8	7.2	3.4	0	0.00
MH_103	152.54	148.94	2005	0.278	DIURNAL	0.0	149.0	3.6	1.2	0	0.00
MH_104	149.44	142.14	2005	0.833	DIURNAL	0.0	142.2	7.3	1.7	0	0.00
MH_105	140.22	135.52	2005	0.000	DIURNAL	0.0	135.5	4.7	0.0	0	0.00
MH_106	159.26	153.46	2005	0.694	DIURNAL	0.0	153.5	5.8	0.8	0	0.00
MH_107	165.26	157.46	2005	0.000	DIURNAL	0.0	157.5	7.8	0.0	0	0.00
MH_108	168.61	163.61	2006	0.000	DIURNAL	0.0	163.6	5.0	0.0	0	0.00
MH_109	168.30	161.31	2006	1.250	DIURNAL	0.0	161.3	7.0	1.4	0	0.00
MH_11	162.55	152.70	1999	1.389	DIURNAL	0.2	152.9	9.6	119.3	0	0.00
MH_110	167.39	160.85	2006	0.000	DIURNAL	0.0	160.9	6.5	0.0	0	0.00
MH_111	162.67	151.97	2006	0.694	DIURNAL	0.0	152.0	10.7	0.8	0	0.00
MH_112	160.53	154.63	2006	0.000	DIURNAL	0.0	154.6	5.9	0.0	0	0.00
MH_113	162.00	153.27	2006	0.833	DIURNAL	0.0	153.3	8.7	0.9	0	0.00
MH_114	161.84	154.24	2006	2.031	DIURNAL	0.0	154.2	7.6	0.0	0	0.00
MH_115	173.10	165.31	2002	0.555	DIURNAL	0.1	165.4	7.7	5.0	0	0.00
MH_116	172.40	166.13	2002	0.417	DIURNAL	0.0	166.2	6.2	4.4	0	0.00
MH_117	172.40	167.10	2002	2.916	DIURNAL	0.0	167.1	5.3	3.9	0	0.00
MH_118	175.00	168.18	2002	0.555	DIURNAL	0.0	168.2	6.8	0.6	0	0.00
MH_119	173.60	169.00	2002	0.000	DIURNAL	0.0	169.0	4.6	0.0	0	0.00
MH_12	164.00	154.97	1999	0.139	DIURNAL	0.2	155.2	8.8	207.0	0	0.00
MH_120	170.40	167.90	2002	0.000	DIURNAL	0.0	167.9	2.5	0.0	0	0.00
MH_121	175.20	170.39	2002	0.000	DIURNAL	0.0	170.4	4.8	0.0	0	0.00
MH_122	113.26	104.71	2004	0.000	DIURNAL	0.0	104.7	8.6	0.0	0	0.00
MH_123	178.86	173.76	2005	0.000	DIURNAL	0.0	173.8	5.1	0.0	0	0.00
MH_124	176.93	169.03	2005	0.000	DIURNAL	0.0	169.0	7.9	0.0	0	0.00
MH_125	129.00	127.10	unknown	0.000	DIURNAL	0.1	127.2	1.8	12.0	0	0.00
MH_126	130.00	121.58	unknown	0.278	DIURNAL	0.1	121.6	8.4	16.4	0	0.00
MH_13	163.06	156.15	1999	0.278	DIURNAL	0.3	156.4	6.6	285.9	0	0.00
MH_14	168.00	159.00	1999	0.833	DIURNAL	0.0	159.0	9.0	2.7	0	0.00
MH_15	170.00	162.12	1999	1.528	DIURNAL	0.0	162.1	7.9	1.7	0	0.00
MH_16	172.00	165.25	1999	0.156	DIURNAL	0.0	165.3	6.8	0.0	0	0.00
MH_17	172.00	165.30	1999	0.156	DIURNAL	0.0	165.3	6.7	0.0	0	0.00
MH_18	172.00	161.48	1999	0.972	DIURNAL	0.2	161.6	10.4	152.5	0	0.00
MH_19	173.57	163.21	1999	1.250	DIURNAL	0.1	163.3	10.3	11.1	0	0.00
MH_2	166.69	157.40	1999	0.417	DIURNAL	0.1	157.5	9.2	54.4	0	0.00
MH_20	174.00	164.20	1999	0.972	DIURNAL	0.1	164.3	9.7	6.1	0	0.00
MH_22	173.83	166.54	1999	1.944	DIURNAL	0.0	166.6	7.3	3.6	0	0.00
MH_23	176.00	167.71	1999	1.250	DIURNAL	0.0	167.7	8.3	1.4	0	0.00
MH_24	170.01	163.10	1999	2.361	DIURNAL	0.0	163.1	6.9	2.7	0	0.00
MH_25	172.28	165.55	1999	0.000	DIURNAL	0.0	165.6	6.7	0.0	0	0.00
MH_26	168.21	154.65	1999	0.972	DIURNAL	0.0	154.7	13.5	3.1	0	0.00
MH_27	168.00	158.00	1999	0.555	DIURNAL	0.2	158.2	9.8	2.0	0	0.00
MH_28	168.00	161.38	1999	1.250	DIURNAL	0.0	161.4	6.6	1.4	0	0.00

20-Year Flows, WWF (PIF5)

Input						Output					
Junction ID (Char)	Rim Elev	Invert Elev	Install Year	Avg DWF (gpm)	DWF Pattern	Max Depth (ft)	Max HGL (ft)	Freeboard (ft)	Max Inflow (gpm)	Total Flood Vol (MG)	Time Flooded (hrs)
MH_29	171.36	164.65	1999	0.156	DIURNAL	0.0	164.7	6.7	0.0	0	0.00
MH_3	170.76	158.97	1999	0.833	DIURNAL	0.1	159.1	11.6	67.6	0	0.00
MH_30	172.00	162.00	1999	0.000	DIURNAL	0.0	162.0	10.0	0.0	0	0.00
MH_31	161.73	152.50	1999	0.139	DIURNAL	0.0	152.5	9.2	3.3	0	0.00
MH_32	144.98	136.80	1999	0.694	DIURNAL	0.0	136.8	8.2	4.1	0	0.00
MH_33	126.08	118.00	1999	0.000	DIURNAL	0.1	118.1	8.0	16.4	0	0.00
MH_34	118.00	110.26	1999	1.111	DIURNAL	0.1	110.3	7.7	17.6	0	0.00
MH_35	111.50	103.87	1999	0.555	DIURNAL	0.1	104.0	7.5	18.2	0	0.00
MH_36	110.00	101.95	1999	0.555	DIURNAL	0.1	102.0	8.0	18.9	0	0.00
MH_37	110.80	100.53	1999	0.833	DIURNAL	0.1	100.6	10.2	19.8	0	0.00
MH_38	111.10	98.63	1999	0.972	DIURNAL	0.1	98.7	12.4	28.5	0	0.00
MH_39	117.34	110.40	1999	0.833	DIURNAL	0.0	110.4	6.9	7.6	0	0.00
MH_4	174.00	166.05	1999	0.417	DIURNAL	0.0	166.1	7.9	2.5	0	0.00
MH_40	134.55	124.10	1999	0.833	DIURNAL	0.0	124.1	10.4	6.7	0	0.00
MH_41	154.37	144.40	1999	0.417	DIURNAL	0.0	144.4	9.9	5.8	0	0.00
MH_42	160.29	147.45	1999	1.250	DIURNAL	0.0	147.5	12.8	5.3	0	0.00
MH_43	160.96	150.60	1999	0.694	DIURNAL	0.0	150.6	10.3	3.9	0	0.00
MH_44	160.65	152.70	1999	0.833	DIURNAL	0.0	152.7	7.9	0.9	0	0.00
MH_45	164.12	154.80	1999	0.156	DIURNAL	0.0	154.8	9.3	0.0	0	0.00
MH_46	168.89	157.40	1999	1.944	DIURNAL	0.0	157.4	11.5	2.2	0	0.00
MH_47	170.64	163.90	1999	0.000	DIURNAL	0.0	163.9	6.7	0.0	0	0.00
MH_48	168.32	161.60	1999	0.156	DIURNAL	0.0	161.6	6.7	0.0	0	0.00
MH_49	167.34	160.85	1999	0.156	DIURNAL	0.0	160.9	6.5	0.0	0	0.00
MH_5	175.24	167.45	1999	0.417	DIURNAL	0.0	167.5	7.8	2.0	0	0.00
MH_50	166.00	158.00	1999	0.156	DIURNAL	0.0	158.0	8.0	0.0	0	0.00
MH_51	162.70	155.00	1999	1.250	DIURNAL	0.0	155.0	7.7	1.4	0	0.00
MH_52	159.19	151.75	1999	1.528	DIURNAL	0.0	151.8	7.4	3.1	0	0.00
MH_53	136.69	123.95	1999	1.805	DIURNAL	0.0	124.0	12.7	5.1	0	0.00
MH_54	122.48	111.00	1999	1.111	DIURNAL	0.1	111.1	11.4	11.2	0	0.00
MH_55	128.54	118.00	1999	0.278	DIURNAL	0.0	118.0	10.5	4.8	0	0.00
MH_56	130.03	122.00	1999	0.555	DIURNAL	0.0	122.0	8.0	4.5	0	0.00
MH_57	111.39	104.50	1999	0.417	DIURNAL	0.0	104.5	6.8	11.7	0	0.00
MH_58	133.11	126.40	1999	0.156	DIURNAL	0.0	126.4	6.7	0.0	0	0.00
MH_59	163.34	156.60	1999	0.156	DIURNAL	0.0	156.6	6.7	0.0	0	0.00
MH_6	176.09	169.20	1999	0.417	DIURNAL	0.0	169.2	6.9	1.6	0	0.00
MH_60	167.54	160.65	1999	0.156	DIURNAL	0.0	160.7	6.9	0.0	0	0.00
MH_61	157.10	150.00	1999	0.833	DIURNAL	0.0	150.0	7.1	2.3	0	0.00
MH_62	164.56	157.65	1999	0.694	DIURNAL	0.0	157.7	6.9	0.8	0	0.00
MH_63	168.00	161.30	1999	0.156	DIURNAL	0.0	161.3	6.7	0.0	0	0.00
MH_64	152.58	142.60	1999	0.156	DIURNAL	0.0	142.6	10.0	0.0	0	0.00
MH_65	160.40	153.50	1999	0.555	DIURNAL	0.0	153.5	6.9	0.6	0	0.00
MH_66	162.55	155.85	1999	0.000	DIURNAL	0.0	155.9	6.7	0.0	0	0.00
MH_67	145.20	138.00	1999	1.389	DIURNAL	0.0	138.0	7.2	3.9	0	0.00
MH_68	104.00	94.80	1999	0.139	DIURNAL	0.1	94.9	9.1	8.9	0	0.00
MH_69	106.38	99.00	1999	0.000	DIURNAL	0.0	99.0	7.3	8.7	0	0.00
MH_7	178.33	171.00	1999	7.582	DIURNAL	0.0	171.0	7.3	1.1	0	0.00
MH_70	119.14	112.00	1999	1.869	DIURNAL	0.0	112.0	7.1	0.6	0	0.00

20-Year Flows, WWF (PIF5)

Input						Output					
Junction ID (Char)	Rim Elev	Invert Elev	Install Year	Avg DWF (gpm)	DWF Pattern	Max Depth (ft)	Max HGL (ft)	Freeboard (ft)	Max Inflow (gpm)	Total Flood Vol (MG)	Time Flooded (hrs)
MH_71	131.64	124.70	1999	4.687	DIURNAL	0.0	124.7	6.9	0.0	0	0.00
MH_72	104.19	97.35	1999	0.043	DIURNAL	0.0	97.4	6.8	0.0	0	0.00
MH_73	110.87	103.00	1999	0.417	DIURNAL	0.0	103.0	7.8	8.1	0	0.00
MH_74	129.34	122.40	1999	0.278	DIURNAL	0.0	122.4	6.9	7.6	0	0.00
MH_75	138.59	131.65	1999	0.417	DIURNAL	0.0	131.7	6.9	7.3	0	0.00
MH_77	151.51	143.30	1999	0.139	DIURNAL	0.0	143.3	8.2	6.9	0	0.00
MH_78	156.40	149.50	1999	1.111	DIURNAL	0.0	149.5	6.9	3.9	0	0.00
MH_79	166.84	159.90	1999	0.139	DIURNAL	0.0	159.9	6.9	1.2	0	0.00
MH_8	160.53	146.36	1999	0.417	DIURNAL	0.1	146.5	14.0	56.8	0	0.00
MH_80	178.23	163.60	1999	0.833	DIURNAL	0.0	163.6	14.6	1.1	0	0.00
MH_81	173.88	167.20	1999	0.139	DIURNAL	0.0	167.2	6.7	0.2	0	0.00
MH_82	158.30	150.50	1999	0.833	DIURNAL	0.0	150.5	7.8	2.8	0	0.00
MH_88	163.11	154.00	1999	0.278	DIURNAL	0.0	154.0	9.1	1.9	0	0.00
MH_89	169.52	161.00	1999	0.139	DIURNAL	0.0	161.0	8.5	1.6	0	0.00
MH_9	162.00	148.48	1999	0.417	DIURNAL	0.2	148.6	13.4	66.4	0	0.00
MH_90	180.00	167.95	1999	0.278	DIURNAL	0.0	168.0	12.0	1.4	0	0.00
MH_91	179.44	169.25	1999	0.278	DIURNAL	0.0	169.3	10.2	1.1	0	0.00
MH_92	177.56	170.65	1999	0.555	DIURNAL	0.0	170.7	6.9	0.8	0	0.00
MH_93	179.64	172.65	1999	0.139	DIURNAL	0.0	172.7	7.0	0.2	0	0.00
MH_94	154.23	150.00	1999	1.250	DIURNAL	0.0	150.0	4.2	1.4	0	0.00
MH_95	158.07	151.20	1999	1.250	DIURNAL	0.0	151.2	6.8	1.4	0	0.00
MH_96	170.19	163.40	1999	0.156	DIURNAL	0.0	163.4	6.8	0.0	0	0.00
MH_97	154.81	145.91	2005	0.000	DIURNAL	0.0	145.9	8.9	0.0	0	0.00
MH_98	145.84	131.29	2005	1.389	DIURNAL	0.1	131.4	14.5	12.0	0	0.00
MH_99	142.99	130.52	2005	0.972	DIURNAL	1.9	132.4	10.6	10.4	0	0.00

20-Year Flows, PIF5

Input								Output					
Pipe ID	Upstream MH	Downstream MH	Length (ft)	Roughness	US Invert	DS Invert	Diameter (ft)	Full Flow (gpm)	Slope (%)	Max Flow (gpm)	Max Velocity (ft/s)	Max.Flow/Full Flow	Max.Depth/Full Depth
GM_1	MH_1	LS4	93.2	0.012	144.55	144.00	0.83	818.275	0.59	163.43	2.608	0.2	0.303
GM_10	MH_10	MH_9	314.0	0.012	150.44	148.68	0.83	797.593	0.56	62.26	1.938	0.078	0.189
GM_100	MH_104	MH_100	223.6	0.012	142.14	133.62	0.67	1,147.39	3.81	2.81	1.532	0.002	0.036
GM_101	MH_100	MH_99	274.0	0.012	133.52	132.42	0.67	372.292	0.40	13.45	1.181	0.036	0.126
GM_102	MH_101	MH_100	268.8	0.012	134.72	133.62	0.67	375.88	0.41	8.34	1.039	0.022	0.099
GM_103	MH_105	MH_101	91.0	0.012	135.52	135.02	0.67	435.66	0.55	0.00	0	0	0
GM_104	MH_103	MH_101	229.8	0.012	148.94	135.02	0.67	1,447.36	6.07	5.78	2.228	0.004	0.046
GM_105	MH_107	MH_106	254.0	0.012	157.46	153.56	0.67	728.118	1.54	0.00	0	0	0
GM_106	MH_106	MH_102	150.9	0.012	153.46	145.90	0.67	1,316.16	5.02	1.28	1.325	0.001	0.024
GM_107	MH_108	MH_109	410.0	0.012	163.61	161.41	0.67	430.411	0.54	0.00	0	0	0
GM_108	MH_109	MH_102	258.0	0.012	161.31	145.90	0.67	1,437.28	5.98	2.30	1.683	0.002	0.03
GM_109	MH_110	MH_111	194.0	0.012	160.85	152.07	0.67	1,250.63	4.53	0.00	0	0	0
GM_11	MH_11	MH_10	376.9	0.012	152.74	150.64	0.83	795.174	0.56	59.91	1.913	0.075	0.186
GM_110	MH_111	MH_104	269.0	0.012	151.97	142.10	0.67	1,123.59	3.66	1.28	0.891	0.001	0.031
GM_111	MH_112	MH_113	148.0	0.012	154.63	153.47	0.67	520.194	0.78	0.00	0	0	0
GM_112	MH_113	MH_103	256.0	0.012	153.27	149.00	0.67	758.901	1.67	5.27	1.393	0.007	0.059
GM_113	MH_115	MH_20	212.5	0.012	165.31	164.30	0.67	405.083	0.48	8.18	1.074	0.02	0.095
GM_114	MH_116	MH_115	89.8	0.012	166.13	165.41	0.67	526.174	0.80	7.15	1.184	0.014	0.082
GM_115	MH_117	MH_116	145.5	0.012	167.10	166.23	0.67	454.352	0.60	6.39	1.05	0.014	0.082
GM_116	MH_118	MH_117	130.0	0.012	168.18	167.30	0.67	483.432	0.68	1.02	0.717	0.002	0.031
GM_117	MH_119	MH_23	234.9	0.012	169.00	167.91	0.67	400.253	0.46	0.00	0	0	0
GM_118	MH_120	MH_117	120.9	0.012	167.90	167.30	0.67	413.929	0.50	0.00	0	0	0
GM_119	MH_121	MH_117	498.8	0.012	170.39	167.30	0.67	462.467	0.62	0.00	0	0	0
GM_12	MH_12	MH_11	348.3	0.012	154.97	152.94	0.83	813.283	0.58	62.29	1.966	0.077	0.187
GM_120	MH_122	MH_35	213.3	0.012	104.71	103.86	0.67	368.763	0.39	0.00	0	0	0.088
GM_121	MH_123	MH_7	378.7	0.012	173.76	171.10	0.67	492.447	0.70	0.00	0	0	0
GM_122	MH_124	MH_118	142.2	0.012	169.03	168.83	0.67	220.372	0.14	0.00	0	0	0
GM_123	MH_98	MH_125	455.3	0.012	131.29	127.20	0.67	556.881	0.90	23.41	1.761	0.042	0.14
GM_124	MH_125	MH_126	316.0	0.012	127.10	125.52	0.67	415.478	0.50	23.41	1.465	0.056	0.159
GM_125	MH_64	MH_32	401.5	0.012	142.60	137.00	0.67	693.975	1.40	0.29	0	0	0.013
GM_126	MH_114	MH_113	152.6	0.012	154.24	153.47	0.67	417.405	0.51	3.74	0.887	0.009	0.064
GM_127	LS4_PUMP	LS4_BREAK	1639.8	0.012	153.00	149.20	0.50	154.289	0.23	299.72	3.401	1.943	1
GM_13	MH_13	MH_12	182.9	0.012	156.15	155.17	0.83	779.783	0.54	81.13	2.062	0.104	0.218
GM_14	MH_14	MH_13	207.0	0.012	159.00	156.35	0.67	664.807	1.28	4.63	1.222	0.007	0.06
GM_15	MH_15	MH_14	390.0	0.012	162.12	159.20	0.67	508.418	0.75	3.10	0.922	0.006	0.055
GM_16	MH_16	MH_15	390.0	0.012	165.25	162.32	0.67	509.287	0.75	0.29	0	0.001	0.014
GM_17	MH_17	MH_10	300.0	0.012	165.30	156.30	0.67	1,017.88	3.00	0.29	0	0	0.011
GM_18	MH_18	MH_3	308.0	0.012	161.48	159.17	0.67	508.851	0.75	88.02	2.434	0.173	0.281
GM_19	MH_19	MH_18	205.0	0.012	163.21	161.68	0.67	507.616	0.75	18.14	1.528	0.036	0.129
GM_2	MH_2	MH_1	225.3	0.012	157.40	146.00	0.83	2,397.98	5.07	99.41	4.831	0.041	0.139
GM_20	MH_20	MH_19	335.0	0.012	164.20	163.41	0.67	285.329	0.24	9.96	0.916	0.035	0.122
GM_22	MH_22	MH_19	115.0	0.012	166.54	165.67	0.67	511.045	0.76	5.88	1.091	0.012	0.075
GM_23	MH_23	MH_22	335.0	0.012	167.71	166.74	0.67	316.169	0.29	2.30	0.635	0.007	0.058
GM_24	MH_24	MH_3	300.0	0.012	163.10	160.85	0.67	508.851	0.75	4.34	1.012	0.009	0.065
GM_25	MH_25	MH_24	270.0	0.012	165.55	163.30	0.67	536.377	0.83	0.00	0	0	0
GM_26	MH_27	MH_26	415.0	0.012	158.20	154.85	0.67	527.911	0.81	3.61	0.981	0.007	0.058
GM_27	MH_28	MH_27	420.0	0.012	161.38	158.20	0.67	511.271	0.76	2.59	0.764	0.005	0.055
GM_28	MH_29	MH_28	410.0	0.012	164.65	161.58	0.67	508.439	0.75	0.29	0	0.001	0.014
GM_3	MH_3	MH_2	231.0	0.012	158.97	157.60	0.83	820.365	0.59	100.05	2.27	0.122	0.236
GM_30	MH_30	MH_26	235.1	0.012	162.00	154.85	0.67	1,024.89	3.04	0.00	0	0	0
GM_31	MH_26	MH_31	258.0	0.012	154.65	152.70	0.67	510.818	0.76	5.40	1.063	0.011	0.072
GM_32	MH_31	MH_32	258.6	0.012	152.50	137.00	0.67	1,439.83	6.01	5.65	2.205	0.004	0.045
GM_33_1	MH_32	MH_126	326.0	0.012	136.80	121.58	0.67	1,270.27	4.67	7.21	1.212	0.006	0.081
GM_33_2	MH_126	MH_33	72.0	0.012	121.58	118.20	0.67	1,273.77	4.70	31.14	3.417	0.024	0.108

20-Year Flows, PIF5

Input								Output					
Pipe ID	Upstream MH	Downstream MH	Length (ft)	Roughness	US Invert	DS Invert	Diameter (ft)	Full Flow (gpm)	Slope (%)	Max Flow (gpm)	Max Velocity (ft/s)	Max.Flow/Full Flow	Max.Depth/Full Depth
GM_34	MH_33	MH_34	256.9	0.012	118.00	110.46	0.67	1,006.83	2.94	31.14	2.907	0.031	0.12
GM_35	MH_34	MH_35	235.1	0.012	110.26	104.07	0.67	953.596	2.63	33.18	2.848	0.035	0.127
GM_36	MH_35	MH_36	228.5	0.012	103.87	102.15	0.67	509.753	0.75	34.20	1.851	0.067	0.175
GM_37	MH_36	MH_37	163.0	0.012	101.95	100.73	0.67	508.401	0.75	35.22	1.863	0.069	0.178
GM_38	MH_37	MH_38	213.3	0.012	100.53	98.83	0.67	524.525	0.80	36.75	1.929	0.07	0.179
GM_39	MH_39	MH_38	187.5	0.012	110.40	98.83	0.67	1,460.97	6.18	13.38	2.905	0.009	0.068
GM_4	MH_4	MH_3	235.1	0.012	166.05	159.17	0.83	1,822.84	2.93	16.25	2.302	0.009	0.067
GM_40	MH_40	MH_39	400.2	0.012	124.10	110.60	0.67	1,079.44	3.38	11.85	2.27	0.011	0.074
GM_41	MH_41	MH_40	279.7	0.012	144.40	124.30	0.67	1,577.10	7.20	10.31	2.836	0.007	0.058
GM_42	MH_42	MH_41	278.9	0.012	147.45	144.60	0.67	593.946	1.02	9.55	1.407	0.016	0.088
GM_43	MH_43	MH_42	395.0	0.012	150.60	147.65	0.67	507.778	0.75	7.25	1.158	0.014	0.083
GM_44	MH_44	MH_43	250.0	0.012	152.70	150.80	0.67	512.23	0.76	1.82	0.779	0.004	0.043
GM_45	MH_45	MH_44	255.0	0.012	154.80	152.90	0.67	507.183	0.75	0.29	0	0.001	0.014
GM_46	MH_46	MH_43	250.0	0.012	157.40	154.25	0.67	659.547	1.26	4.15	1.171	0.006	0.057
GM_47	MH_47	MH_46	150.1	0.012	163.90	157.60	0.67	1,204.17	4.20	0.00	0	0	0
GM_48	MH_48	MH_46	400.0	0.012	161.60	158.60	0.67	508.853	0.75	0.29	0	0.001	0.014
GM_49	MH_49	MH_46	430.0	0.012	160.85	157.60	0.67	510.822	0.76	0.29	0	0.001	0.014
GM_5	MH_5	MH_4	210.0	0.012	167.45	166.25	0.83	805.325	0.57	15.49	1.309	0.019	0.095
GM_50	MH_50	MH_51	220.0	0.012	158.00	155.20	0.67	662.867	1.27	0.29	0	0	0.013
GM_51	MH_51	MH_52	403.3	0.012	155.00	151.95	0.67	510.96	0.76	2.87	0.903	0.006	0.053
GM_52	MH_52	MH_53	437.0	0.012	151.75	124.15	0.67	1,478.13	6.33	5.97	2.283	0.004	0.046
GM_53	MH_53	MH_54	385.7	0.012	123.95	111.20	0.67	1,068.60	3.31	9.58	2.112	0.009	0.067
GM_54	MH_55	MH_54	274.1	0.012	118.00	111.20	0.67	925.694	2.48	8.21	1.824	0.009	0.067
GM_55	MH_56	MH_55	158.1	0.012	122.00	118.20	0.67	911.209	2.41	7.70	1.77	0.008	0.065
GM_56	MH_67	MH_56	284.6	0.012	138.00	122.20	0.67	1,385.55	5.56	6.67	2.257	0.005	0.05
GM_57	MH_54	MH_57	275.7	0.012	111.00	104.70	0.67	888.288	2.29	19.83	2.326	0.022	0.103
GM_58	MH_58	MH_53	300.0	0.012	126.40	124.15	0.67	508.851	0.75	0.29	0	0.001	0.014
GM_59	MH_59	MH_52	220.5	0.012	156.60	151.95	0.67	853.436	2.11	0.29	0	0	0.011
GM_6	MH_6	MH_5	275.0	0.012	169.20	167.65	0.83	799.815	0.56	14.72	1.285	0.018	0.093
GM_60	MH_60	MH_51	358.0	0.012	160.65	156.00	0.67	669.647	1.30	0.29	0	0	0.013
GM_61	MH_62	MH_61	237.1	0.012	157.65	150.20	0.67	1,041.75	3.14	1.56	1.196	0.002	0.029
GM_62	MH_63	MH_62	215.0	0.012	161.30	157.85	0.67	744.301	1.61	0.29	0	0	0.012
GM_64	MH_65	MH_61	230.0	0.012	153.50	150.20	0.67	703.813	1.44	1.02	0.851	0.001	0.027
GM_65	MH_66	MH_65	230.0	0.012	155.85	153.70	0.67	568.089	0.94	0.00	0	0	0
GM_67	MH_61	MH_67	281.8	0.012	150.00	138.20	0.67	1,202.99	4.19	4.12	1.772	0.003	0.043
GM_68	MH_69	MH_68	122.1	0.012	99.00	95.00	0.67	1,063.91	3.28	25.35	2.835	0.024	0.106
GM_69	MH_70	MH_69	267.8	0.012	112.00	99.20	0.67	1,285.29	4.79	12.06	2.575	0.009	0.068
GM_7	MH_7	MH_6	285.0	0.012	171.00	169.43	0.83	790.71	0.55	13.95	1.258	0.018	0.091
GM_70	MH_71	MH_70	267.8	0.012	124.70	112.20	0.67	1,270.15	4.67	8.62	2.314	0.007	0.059
GM_72	MH_72	MH_68	338.0	0.012	97.35	95.00	0.67	489.931	0.70	0.08	0	0	0.007
GM_73	MH_73	MH_69	179.2	0.012	103.00	99.20	0.67	855.745	2.12	13.29	2.005	0.016	0.087
GM_74	MH_74	MH_73	367.5	0.012	122.40	103.20	0.67	1,343.94	5.23	12.52	2.687	0.009	0.068
GM_75	MH_75	MH_74	184.2	0.012	131.65	122.60	0.67	1,303.10	4.92	12.01	2.597	0.009	0.068
GM_76	MH_77	MH_75	275.2	0.012	143.30	131.85	0.67	1,198.94	4.16	11.24	2.402	0.009	0.068
GM_77	MH_78	MH_77	103.2	0.012	149.50	143.50	0.67	1,418.17	5.83	6.39	2.263	0.005	0.048
GM_78	MH_79	MH_78	207.5	0.012	159.90	149.70	0.67	1,303.48	4.92	2.04	1.517	0.002	0.03
GM_79	MH_80	MH_79	310.3	0.012	163.60	160.10	0.67	624.028	1.13	1.79	0.875	0.003	0.039
GM_8	MH_8	MH_1	288.0	0.012	146.36	144.55	0.83	844.566	0.63	62.25	1.373	0.074	0.243
GM_81	MH_81	MH_80	455.0	0.012	167.20	163.80	0.67	507.921	0.75	0.26	0	0.001	0.013
GM_87	MH_82	MH_77	240.1	0.012	150.50	143.50	0.67	1,003.47	2.92	4.60	1.61	0.005	0.049
GM_88	MH_88	MH_82	238.0	0.012	154.00	150.70	0.67	691.882	1.39	3.07	1.099	0.004	0.048
GM_89	MH_89	MH_88	129.7	0.012	161.00	154.20	0.67	1,346.41	5.25	2.56	1.661	0.002	0.032
GM_9	MH_9	MH_8	343.0	0.012	148.48	146.56	0.83	797.053	0.56	61.73	1.932	0.077	0.188
GM_90	MH_90	MH_89	139.2	0.012	167.95	161.20	0.67	1,294.83	4.86	2.30	1.565	0.002	0.031

20-Year Flows, PIF5

Input								Output					
Pipe ID	**Upstream MH**	**Downstream MH**	**Length (ft)**	**Roughness**	**US Invert**	**DS Invert**	**Diameter (ft)**	**Full Flow (gpm)**	**Slope (%)**	**Max Flow (gpm)**	**Max Velocity (ft/s)**	**Max.Flow/Full Flow**	**Max.Depth/Full Depth**
GM_91	MH_91	MH_90	146.0	0.012	169.25	168.15	0.67	510.02	0.75	1.79	0.773	0.004	0.042
GM_92	MH_92	MH_91	160.0	0.012	170.65	169.45	0.67	508.859	0.75	1.28	0.741	0.003	0.035
GM_93	MH_93	MH_92	150.0	0.012	172.65	170.85	0.67	643.654	1.20	0.26	0	0	0.012
GM_94	MH_94	MH_78	50.0	0.012	150.00	149.70	0.67	455.135	0.60	2.30	0.796	0.005	0.049
GM_95	MH_95	MH_1	214.0	0.012	151.20	149.60	0.67	508.054	0.75	2.59	0.871	0.005	0.05
GM_96	MH_96	MH_95	370.2	0.012	163.40	151.40	0.67	1,058.17	3.24	0.29	0	0	0.011
GM_97	MH_97	MH_98	262.0	0.012	145.91	131.44	0.67	1,381.90	5.53	0.00	0	0	0
GM_98	MH_99	MH_98	147.9	0.012	132.32	131.44	0.67	453.218	0.60	20.86	1.477	0.046	0.146
GM_99	MH_102	MH_99	231.4	0.012	145.80	132.42	0.67	1,414.07	5.79	5.62	2.174	0.004	0.046

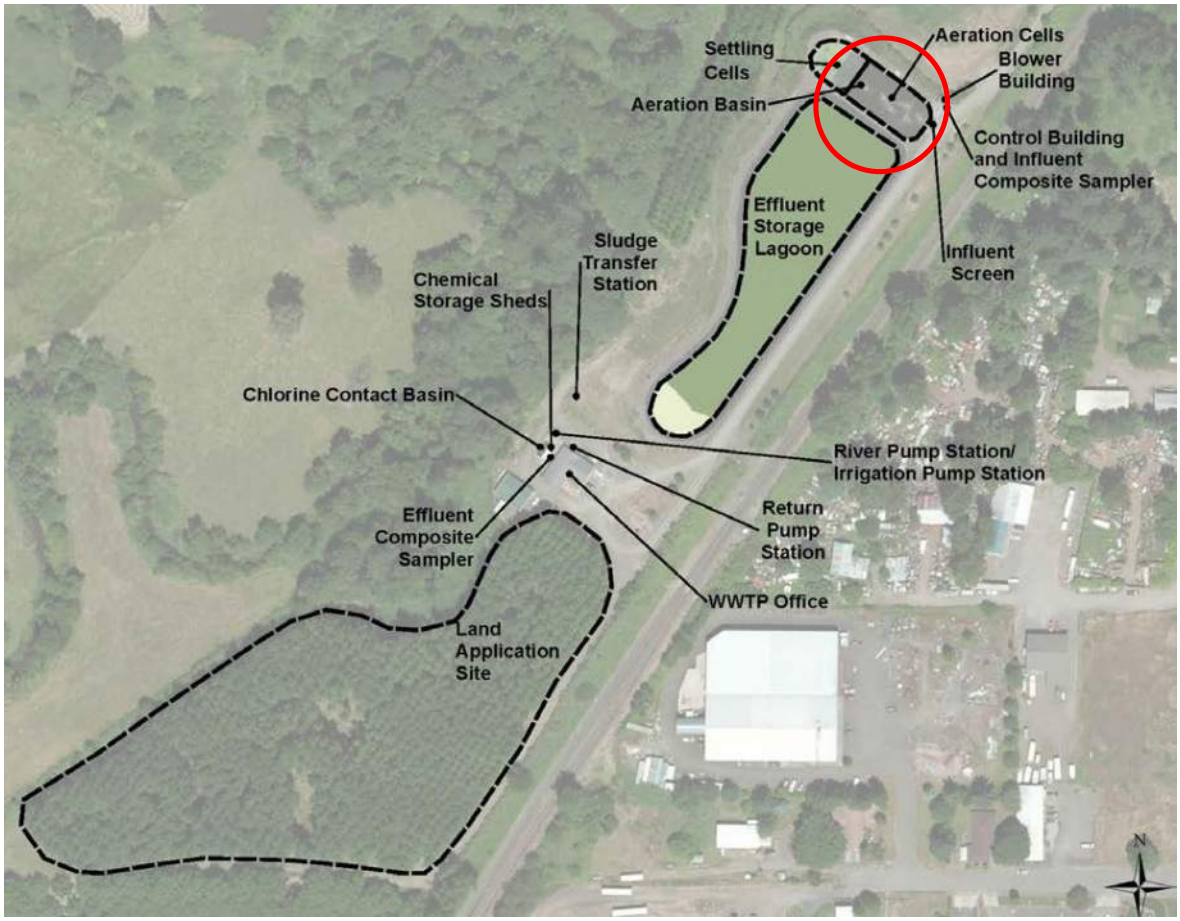
Appendix G
Project Summaries

Wastewater Facilities Project: Aerated Lagoon Aeration

Project Identifier: 1.1

Objective: Replace the existing aeration system with new diffusers that are more easily removable for inspection and maintenance and with additional aeration capacity through the planning period.

Project Location: Aerated Lagoon



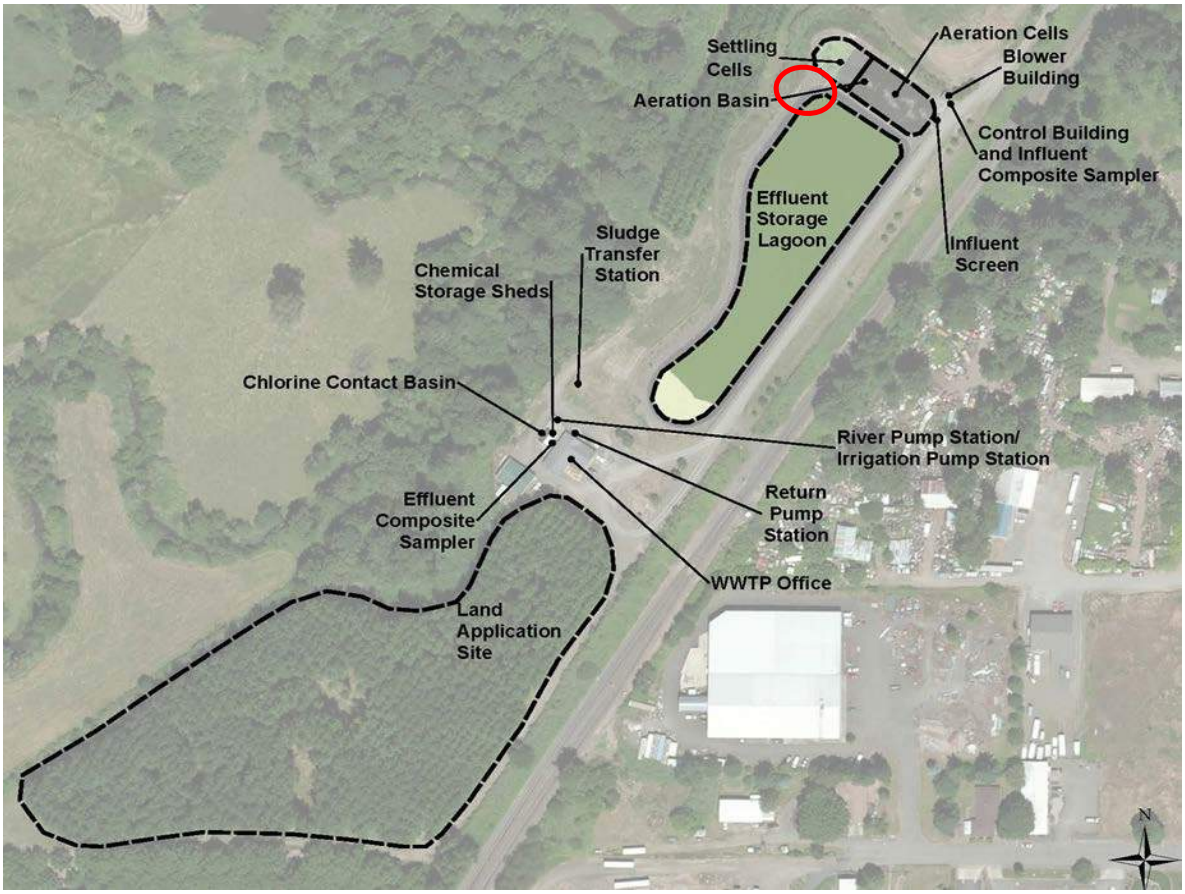
Item	Cost (2019)
Diffusers and Blowers	$ 70,000
Blower Shed	$ 11,000
DO Probes and Controller	$ 9,000
Electrical/Controls	$ 12,000
Mobilization (10%)	$ 11,000
Overhead and Profit (15%)	$ 16,000
Contingency (30%)	$ 31,000
Construction Subtotal	**$ 160,000**
Soft Costs (25%)	$ 40,000
Total Project Cost	**$ 200,000**

Wastewater Facilities Project: Lagoon Overflow, Structural Inspection, and Bank Stabilization

Project Identifier: 1.2

Objective: Add an overflow to the lagoons to protect the lagoons from overtopping. Perform a structural inspection of the lagoons. Add bank stabilization near the chlorine contact basin.

Project Location: Lagoons



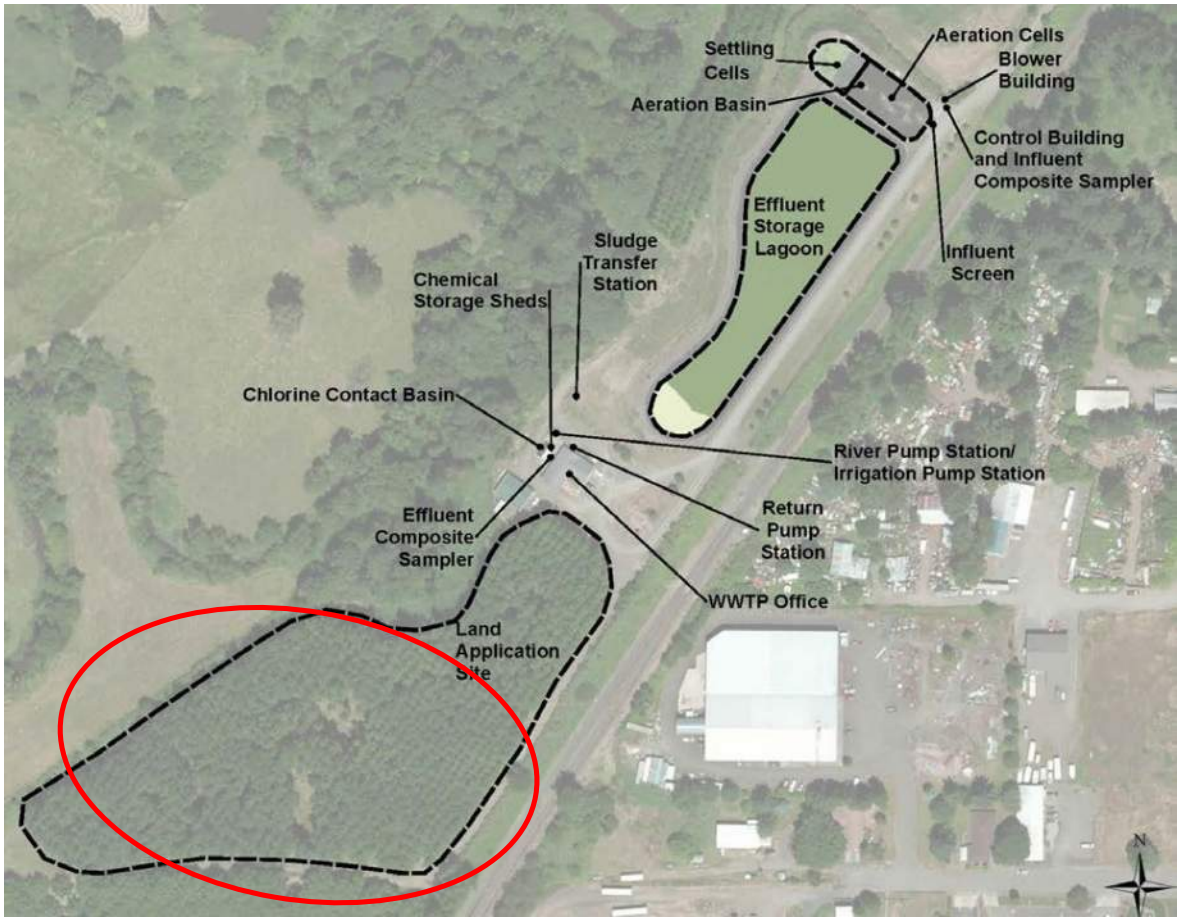
Item	Cost (2019)
Structural Inspection	$ 21,000
Overflows	$ 84,000
Bank Stabilization	$ 53,000
Mobilization (10%)	$ 16,000
Overhead and Profit (15%)	$ 24,000
Contingency (30%)	$ 48,000
Construction Subtotal	**$ 246,000**
Soft Costs (25%)	$ 62,000
Total Project Cost	**$ 308,000**

Wastewater Facilities Project: **Additional Effluent Storage Lagoon**

Project Identifier: **1.3**

Objective: An additional effluent storage lagoon and pump station to store the water during the summer.

Project Location: New Effluent Storage Lagoon



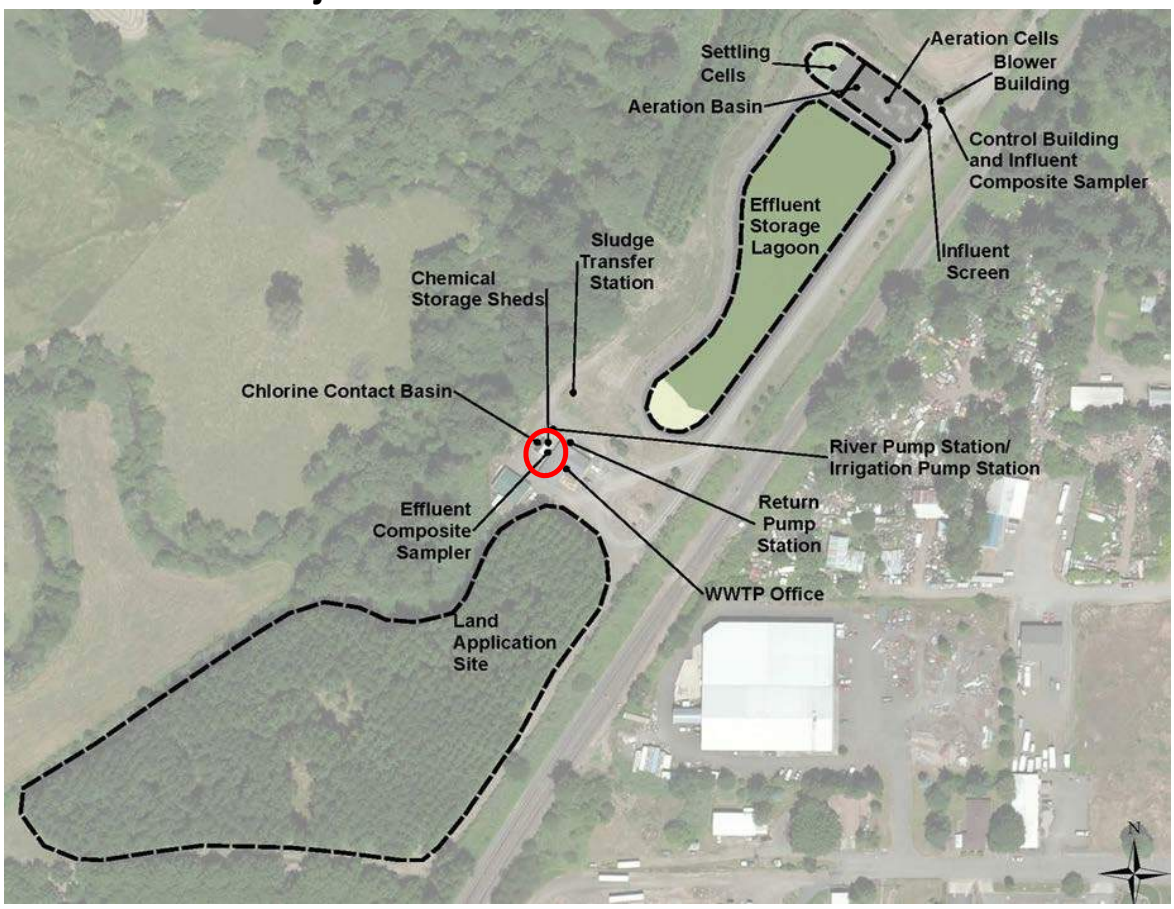
Item	Cost (2019)
Site Work	$ 10,000
Storage Lagoon	$ 920,000
Pump Station	$ 190,000
Piping/Valves and Instrumentation*	$ 370,000
Electrical/Controls	$ 50,000
Mobilization (10%)	$ 160,000
Overhead and Profit (15%)	$ 240,000
Contingency (30%)	$ 470,000
Construction Subtotal	**$ 2,410,000**
Soft Costs (25%)	$ 610,000
Total Project Cost	**$ 3,020,000**

Wastewater Facilities Project: Chlorination/Dechlorination System Upgrade

Project Identifier: 1.4

Objective: Replace the chemical storage with a well-ventilated, heated, and corrosion-resistant building. A chlorine monitor and an automatic alarm should be installed if a dosing pump fails or if the chlorine residual rises.

Project Location: Chlorine Contact Basin



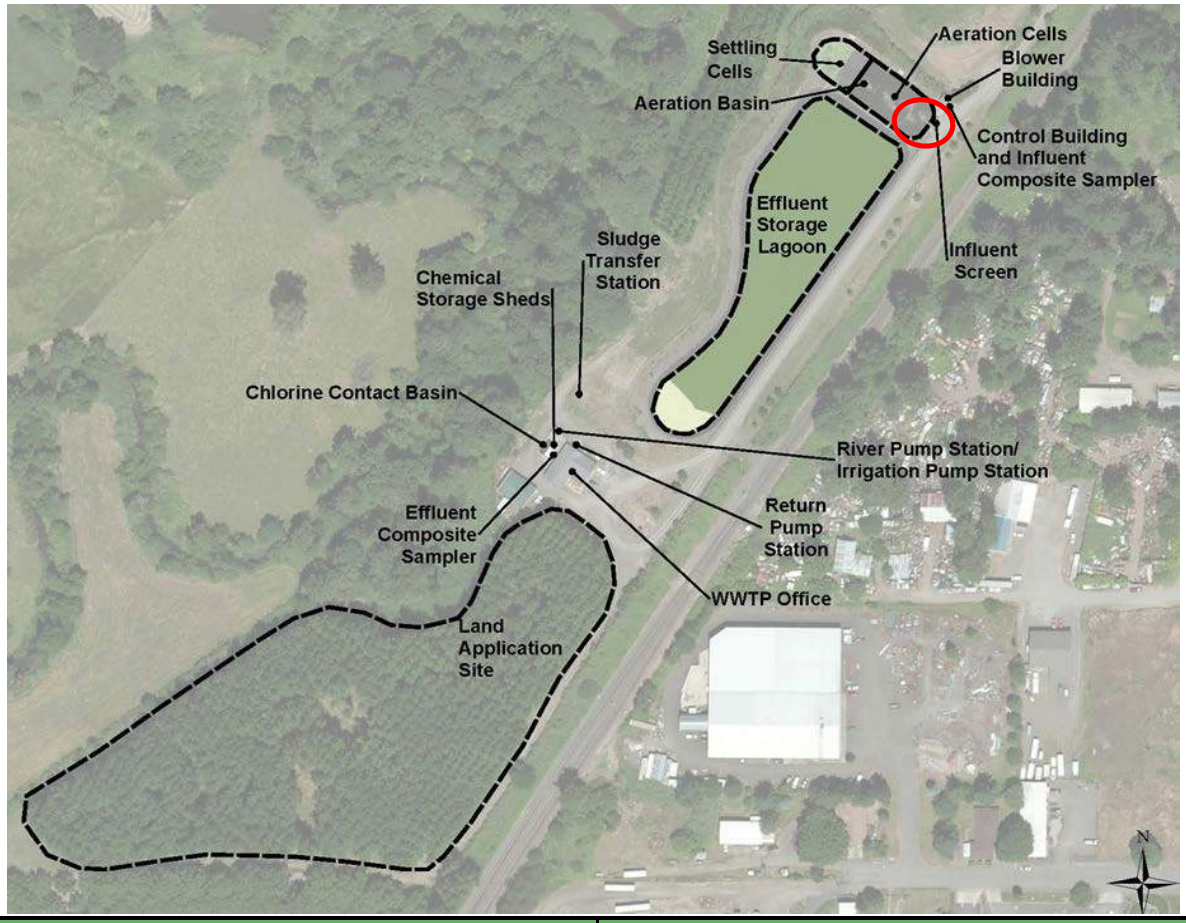
Item	Cost (2019)	
Storage Buildings	$	90,000
Chlorine Monitoring Equipment	$	21,000
Evaluation and Baffles/Mixer Modifications	$	21,000
Electrical/Controls	$	30,000
Mobilization (10%)	$	17,000
Overhead and Profit (15%)	$	25,000
Contingency (30%)	$	49,000
Construction Subtotal	**$**	**253,000**
Soft Costs (25%)	$	64,000
Total Project Cost	**$**	**317,000**

Wastewater Facilities Project: **Headworks Upgrade**

Project Identifier: **1.5**

Objective: Upgrade the headworks to add a cover and freeze protection to the influent screen. Also add a shelter around the composite sampler and move it closer to the sample location.

Project Location: Headworks



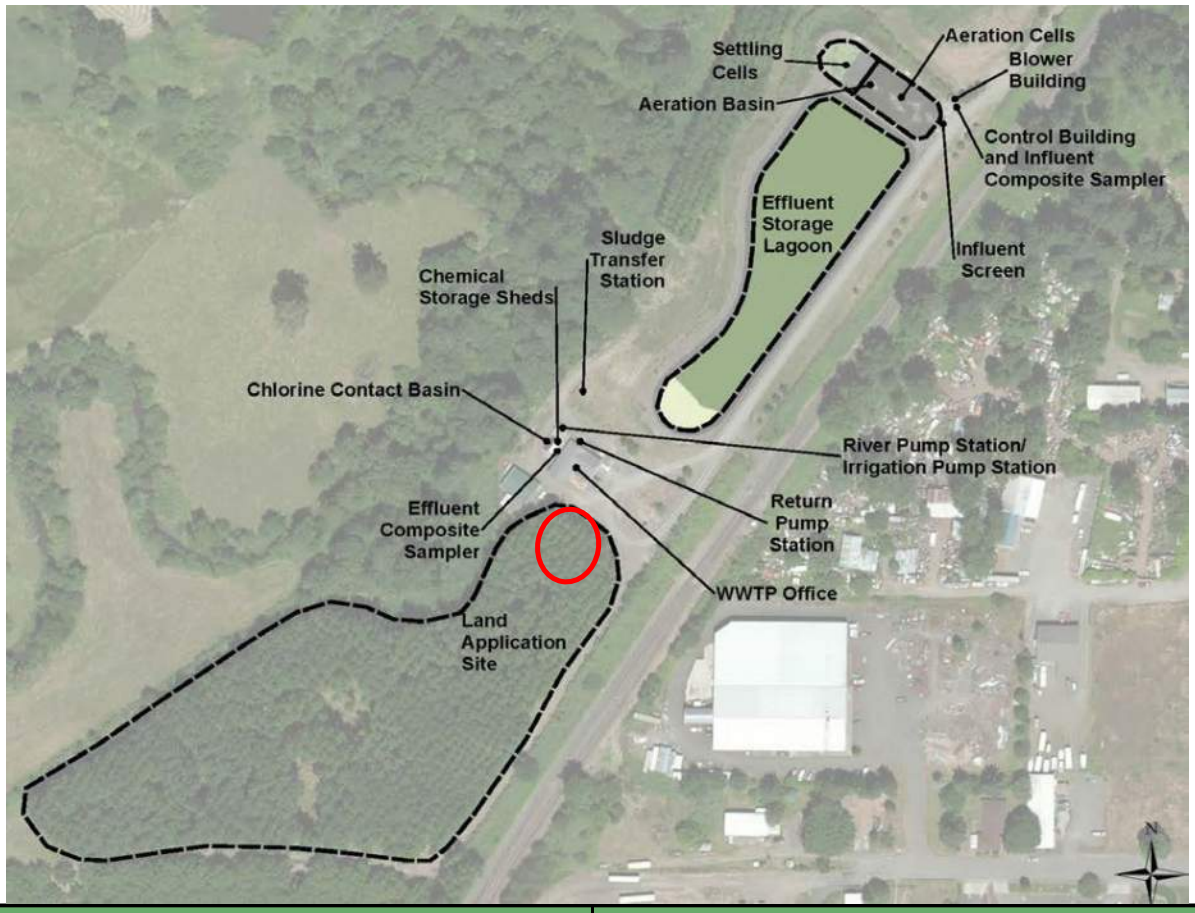
Item	Cost (2019)
Heat Tape Influent Screen	$ 40,000
Cover Influent Screen and Composite Sampler	$ 32,000
Mobilization (10%)	$ 8,000
Overhead and Profit (15%)	$ 11,000
Contingency (30%)	$ 22,000
Construction Subtotal	**$ 113,000**
Soft Costs (25%)	$ 29,000
Total Project Cost	**$ 142,000**

Wastewater Facilities Project: Aerobic Digester

Project Identifier: 1.6

Objective: An aerobic digester would help the WWTP achieve Class B biosolids (60-day SRT in the winter). This would allow the City the flexibility to either be land applied by farmers or to continue to be sent to the City of Salem.

Project Location: Sludge Transfer Station



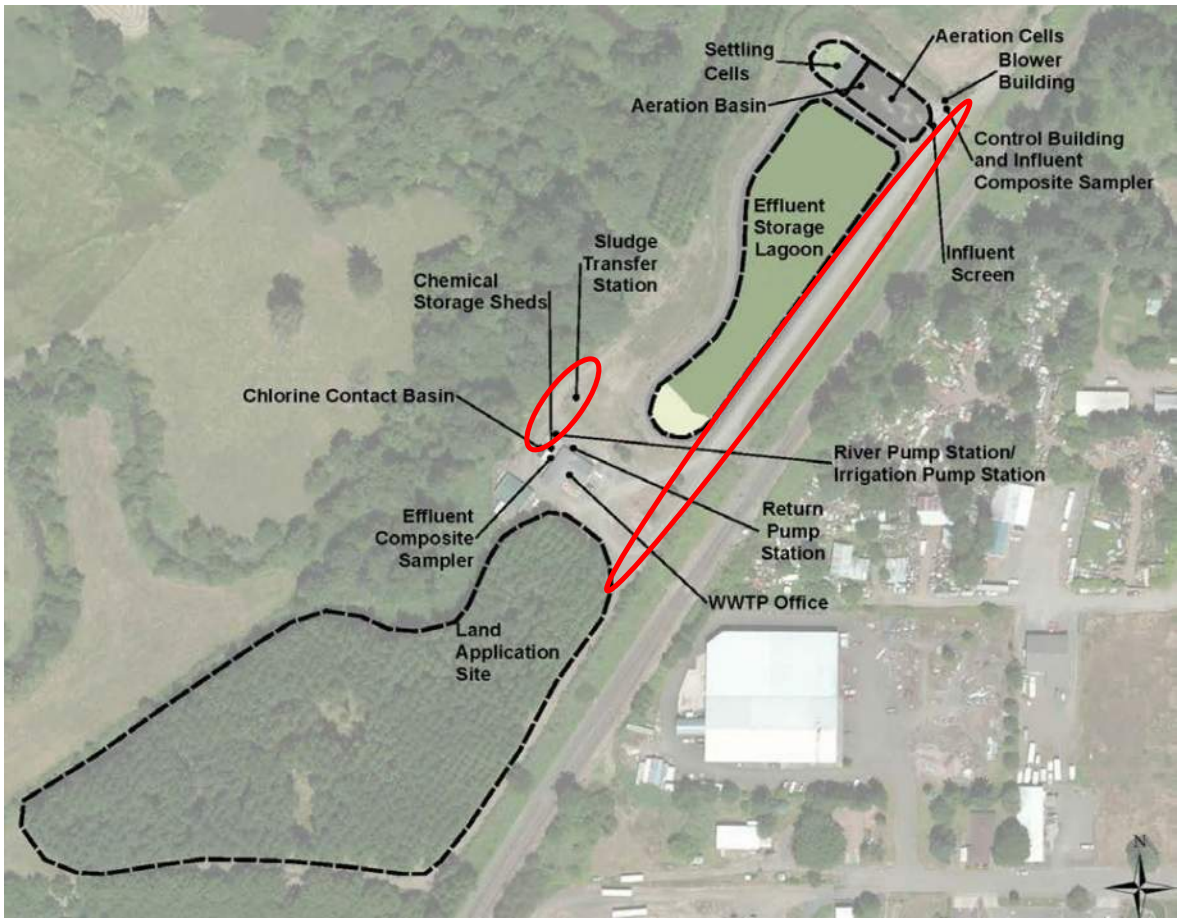
Item	Cost (2019)
Site Work	$ 10,000
Digester Basin (including guardrails, grating)	$ 90,000
Digester Equipment	$ 63,000
Digester Blower Building	$ 40,000
Piping/Valves and Instrumentation	$ 42,000
Electrical/Controls	$ 40,000
Mobilization (10%)	$ 30,000
Overhead and Profit (15%)	$ 50,000
Contingency (30%)	$ 90,000
Construction Subtotal	**$ 455,000**
Soft Costs (25%)	$ 120,000
Total Project Cost	**$ 575,000**

Wastewater Facilities Project: **Site Work At WWTP**

Project Identifier: **1.7**

Objective: Pave the road at the WWTP Office and add storm water drainage.

Project Location: Throughout WWTP



Item	Cost (2019)
Asphalt Pavement	$ 147,000

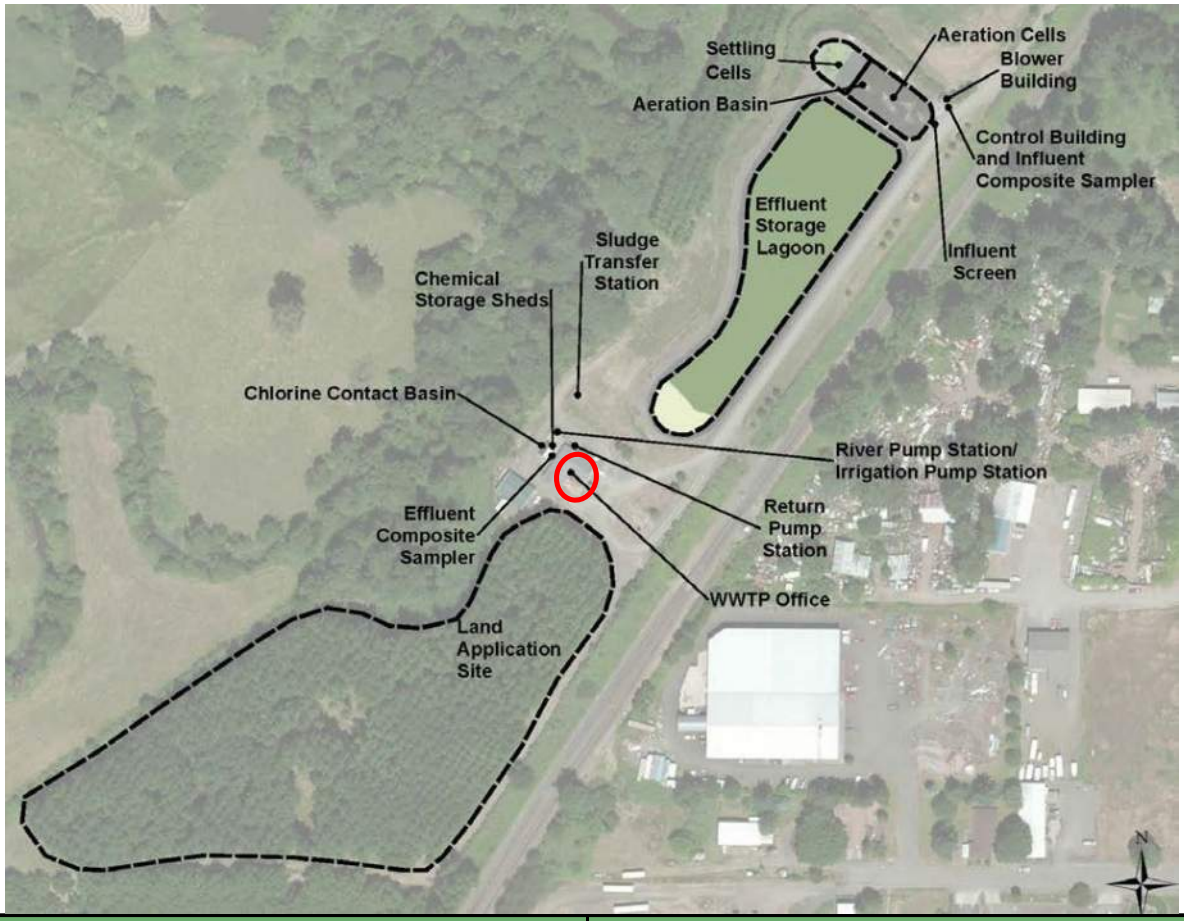
Culverts	$ 11,000
Mobilization (10%)	$ 16,000
Overhead and Profit (15%)	$ 24,000
Contingency (30%)	$ 48,000
Construction Subtotal	**$ 246,000**
Soft Costs (25%)	$ 62,000
Total Project Cost	**$ 308,000**

Wastewater Facilities Project: **SCADA Upgrade**

Project Identifier: **1.8**

Objective: A new SCADA system to include the improvements and provide essential alarms.

Project Location: WWTP Office



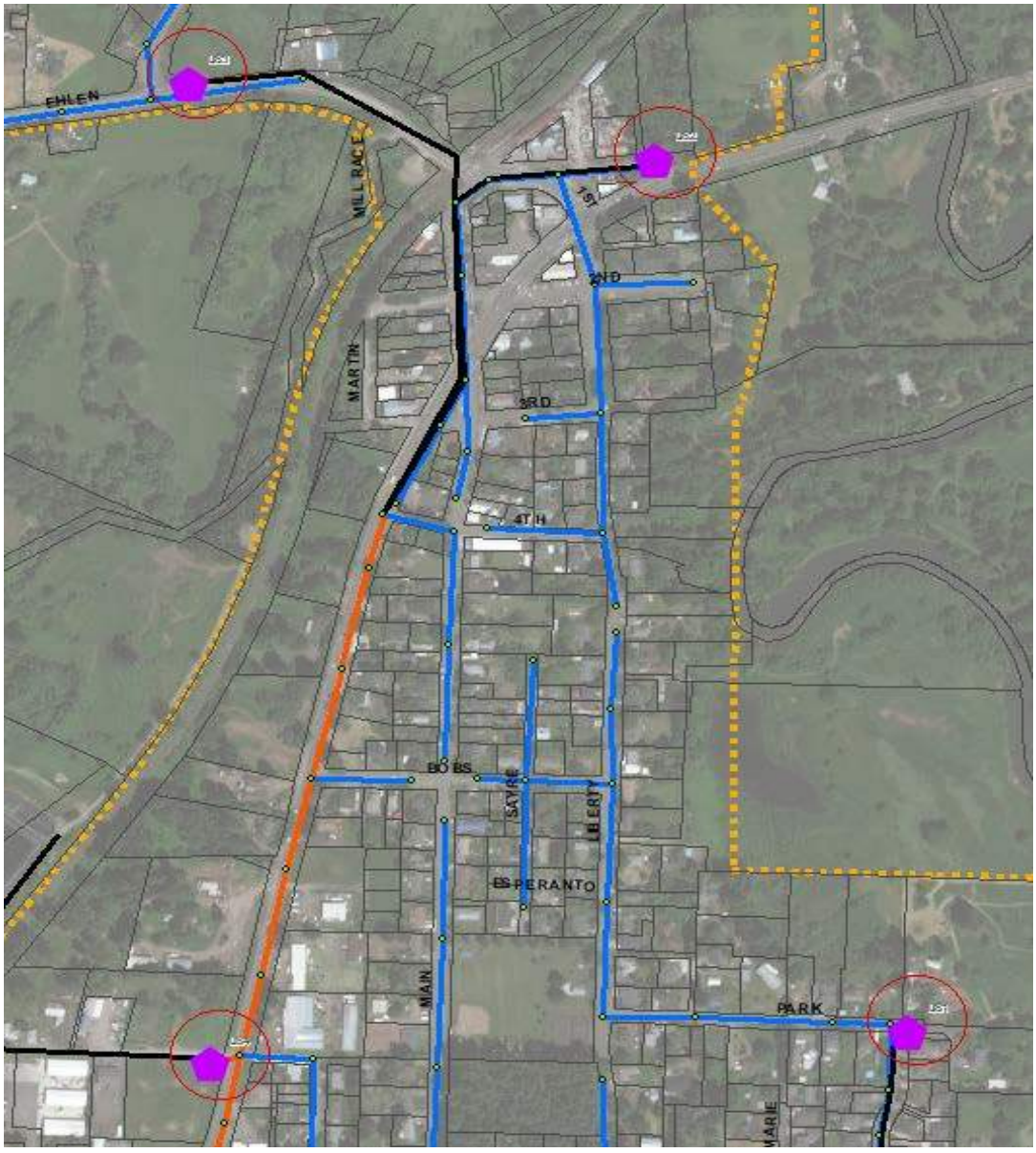
Item	Cost (2019)
SCADA System	$ 105,000
Mobilization (10%)	$ 11,000
Overhead and Profit (15%)	$ 16,000
Contingency (30%)	$ 32,000
Construction Subtotal	**$ 164,000**
Soft Costs (25%)	$ 41,000
Total Project Cost	**$ 205,000**

Wastewater Facilities Project: **Lift Station Upgrades**

Project Identifier: **1.9**

Objective: Upgrade lift stations to increase safety measures and to improve resiliency.

Project Location: Lift Station Improvements



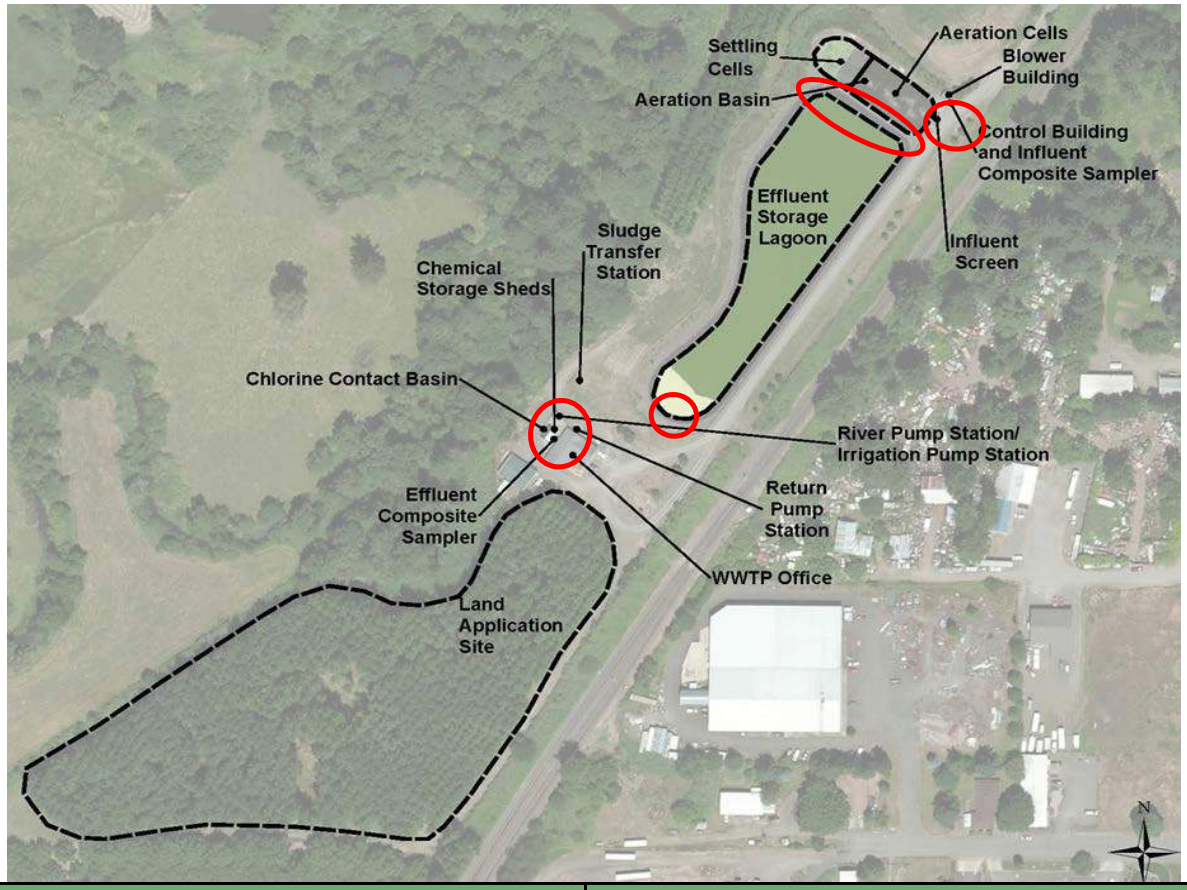
Item	Cost (2019)
Lift Station 1	$23,000
Lift Station 2	$25,000
Lift Station 3	$25,000
Lift Station 4	$22,000
Overhead and Profit (15%)	$15,000
Contingency (30%)	$29,000
Construction Subtotal	**$ 139,000**
Soft Costs (25%)	$37,000
Total Project Cost	**$ 176,000**

Wastewater Facilities Project: **Fall Protection**

Project Identifier: **2.1**

Objective: Add fall protection to the Headworks, Lagoons, Chlorine Contact Basin, and WWTP Pump Stations.

Project Location: Throughout WWTP



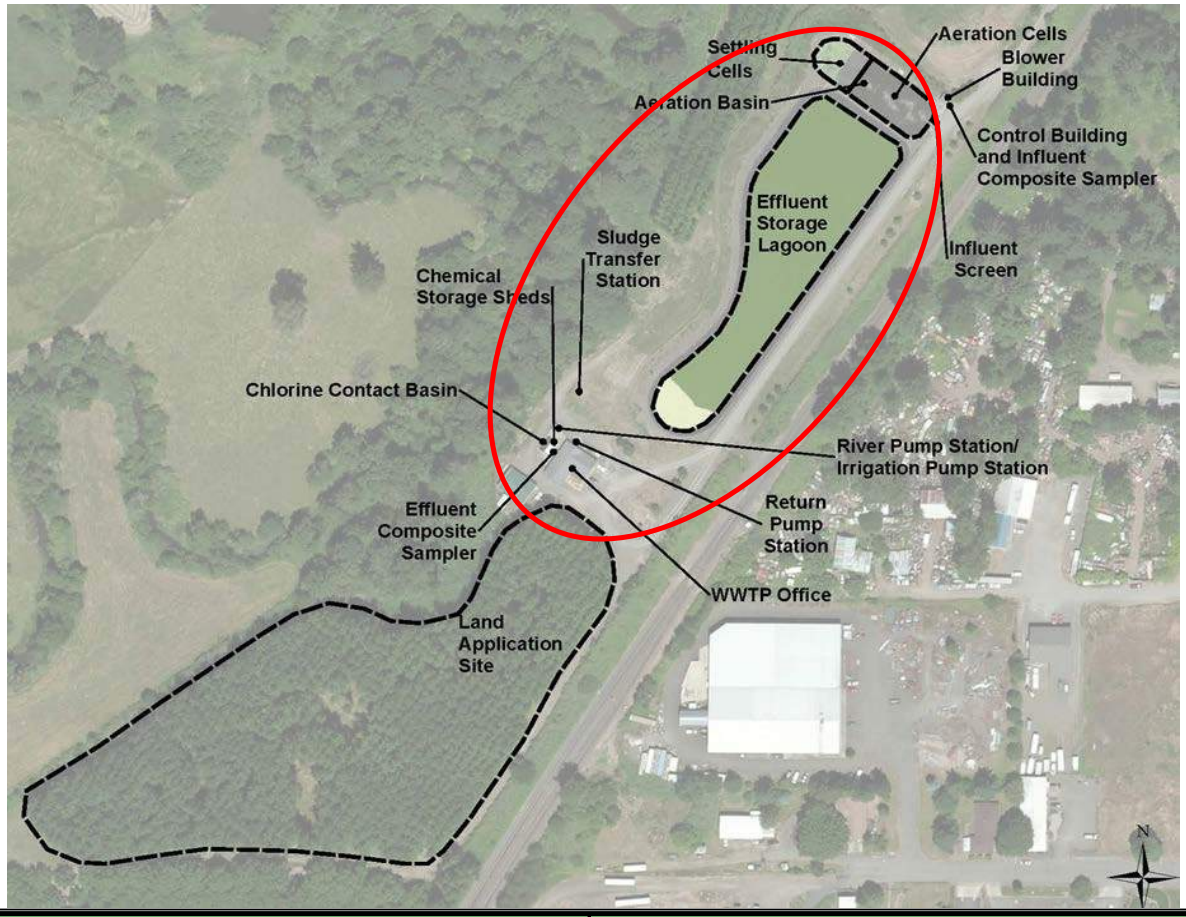
Item	Cost (2019)	
Hookup Lifelines and Chlorine Contact Basin Railing	$	63,000
Mobilization (10%)	$	7,000
Overhead and Profit (15%)	$	10,000
Contingency (30%)	$	19,000
Construction Subtotal	**$**	**99,000**
Soft Costs (25%)	$	25,000
Total Project Cost	**$**	**124,000**

Wastewater Facilities Project: **Fencing**

Project Identifier: **2.2**

Objective: Add fencing around the WWTP (add to existing; does not include fence around land application).

Project Location: Throughout WWTP



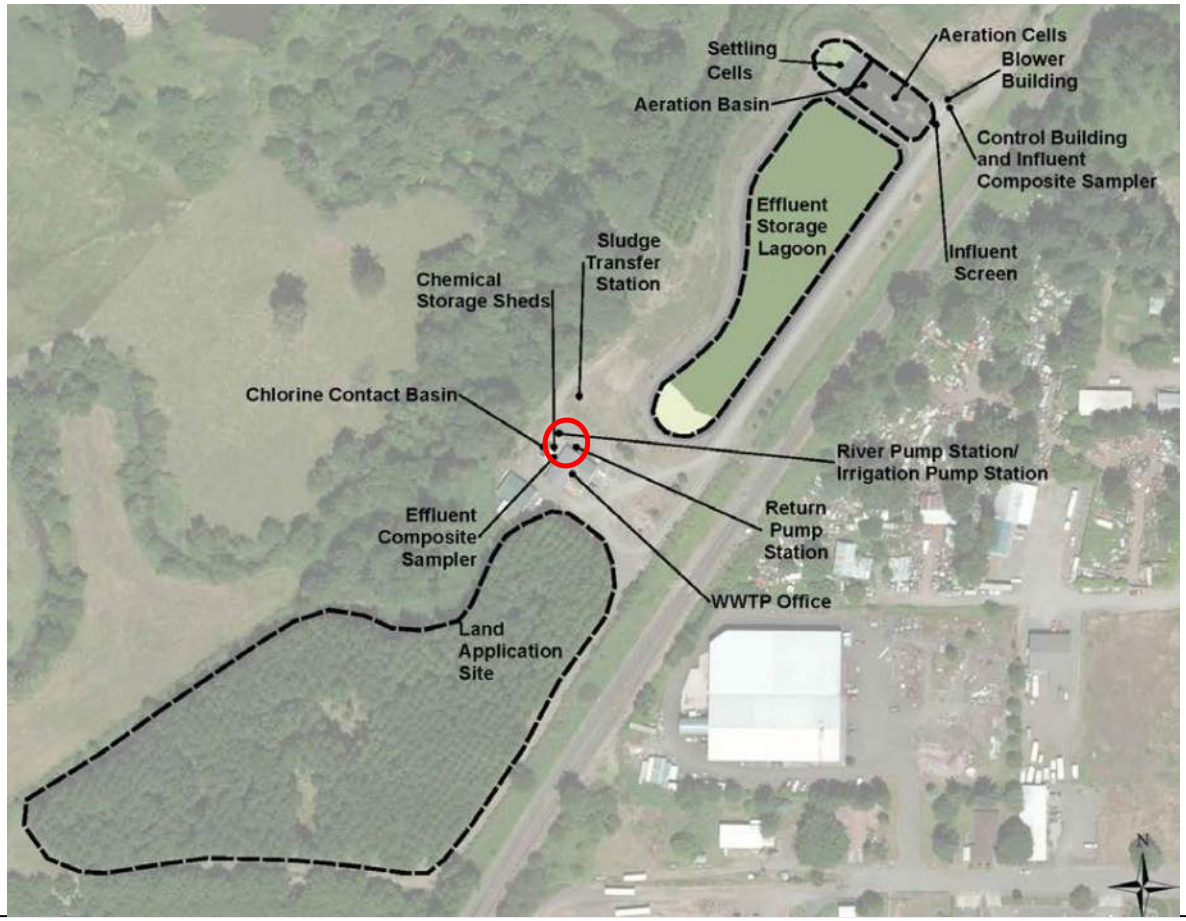
Item	Cost (2019)	
Fencing and Gates	$	53,000
Mobilization (10%)	$	6,000
Overhead and Profit (15%)	$	8,000
Contingency (30%)	$	16,000
Construction Subtotal	**$**	**83,000**
Soft Costs (25%)	$	21,000
Total Project Cost	**$**	**104,000**

Wastewater Facilities Project: **WWTP Pump Station VFDs**

Project Identifier: **2.3**

Objective: Replace the pump starters with VFDs to improve operation and reduce energy usage.

Project Location: WWTP Pump Stations



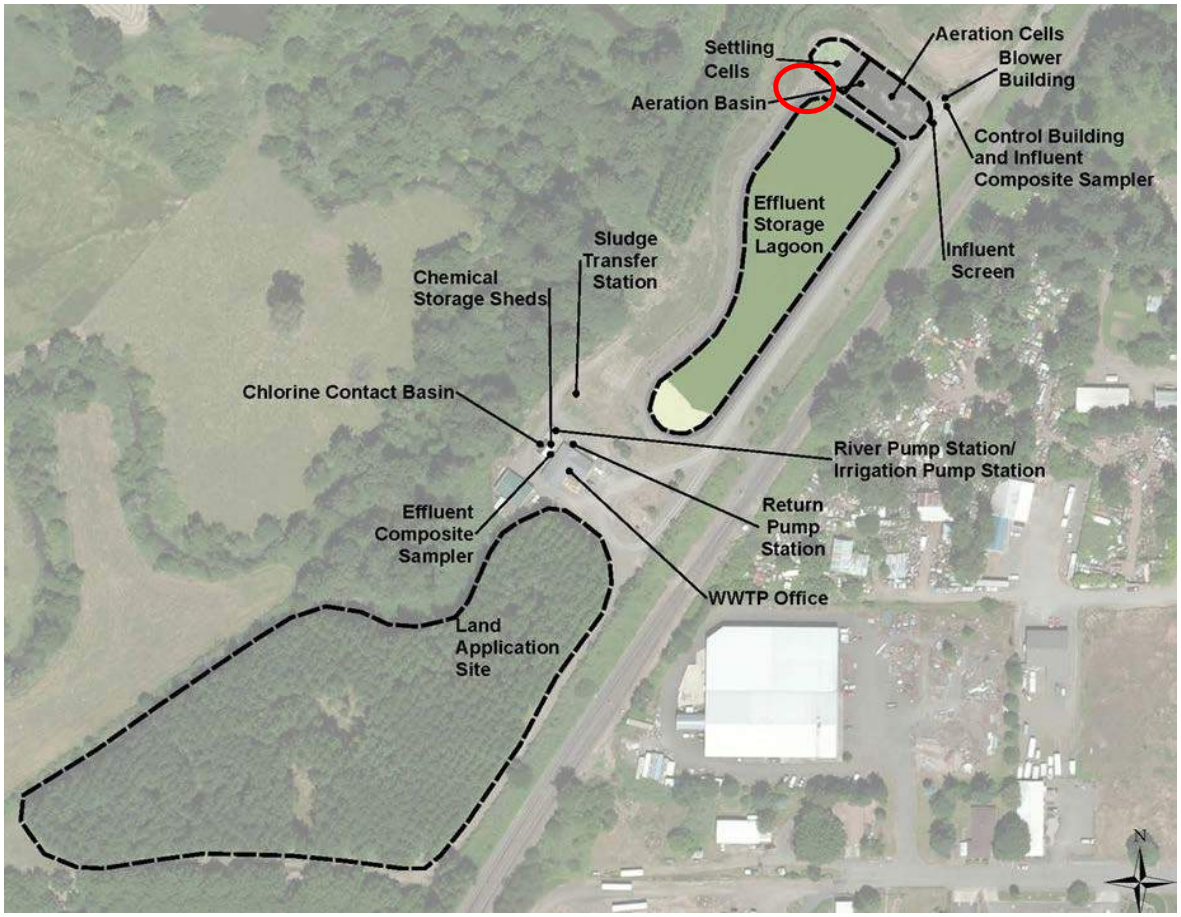
Item	Cost (2019)	
WWTP Pump VFDs	$	90,000
Mobilization (10%)	$	9,000
Overhead and Profit (15%)	$	14,000
Contingency (30%)	$	27,000
Construction Subtotal	**$**	**140,000**
Soft Costs (25%)	$	35,000
Total Project Cost	**$**	**175,000**

Wastewater Facilities Project: **Aerated Lagoon Sludge Pumps**

Project Identifier: **2.4**

Objective: Add permanent pumps, flow meters, piping, and valves for sludge wasting, scum removal, and recycling.

Project Location: Aerated Lagoon



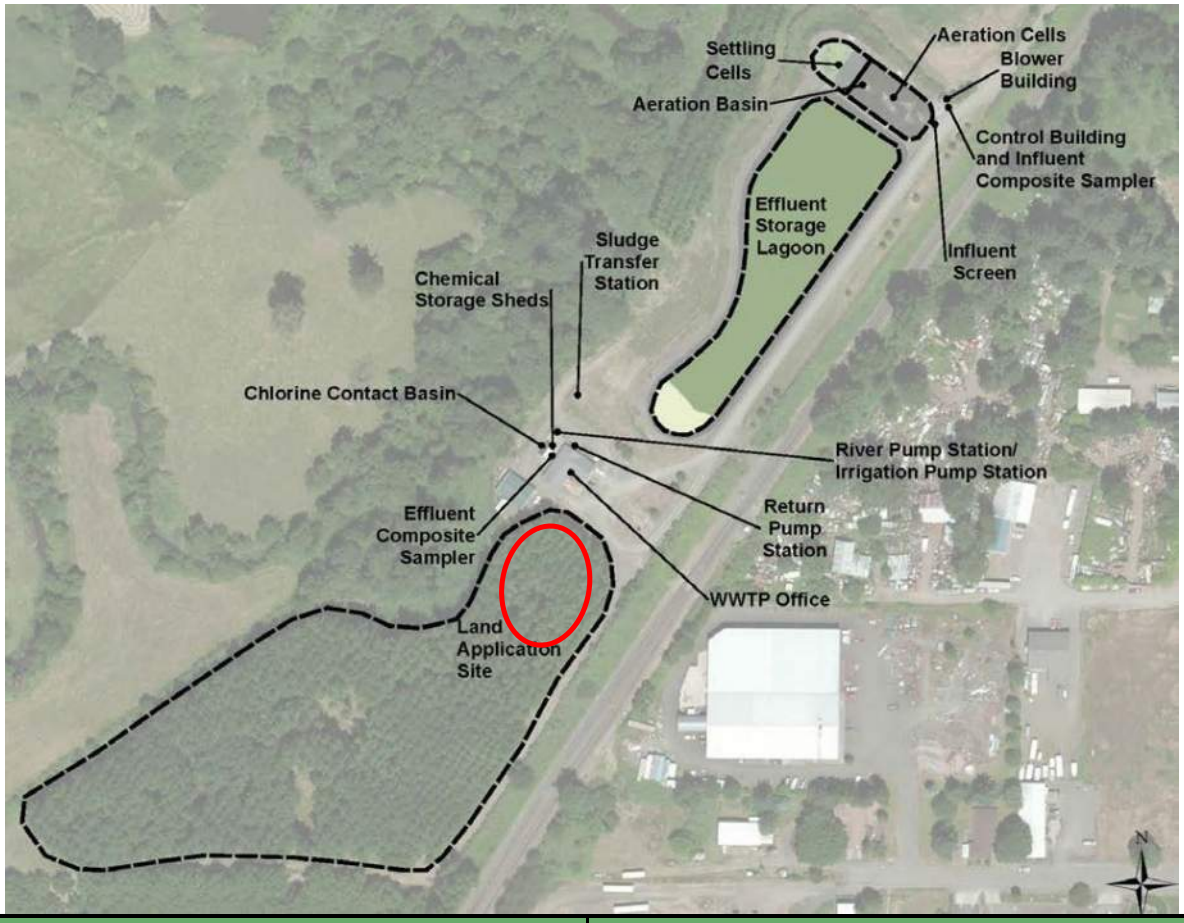
Item	Cost (2019)	
Sludge Pumps with Enclosure	$	42,000
Piping/Valves and Instrumentation	$	42,000
Electrical/Controls	$	17,000
Mobilization (10%)	$	2,000
Overhead and Profit (15%)	$	3,000
Contingency (30%)	$	6,000
Construction Subtotal	**$**	**112,000**
Soft Costs (25%)	$	28,000
Total Project Cost	**$**	**140,000**

Wastewater Facilities Project: **Permanent Irrigation System**

Project Identifier: **2.5**

Objective: Install a permanent irrigation system to reduce operator maintenance.

Project Location: Land Application Site



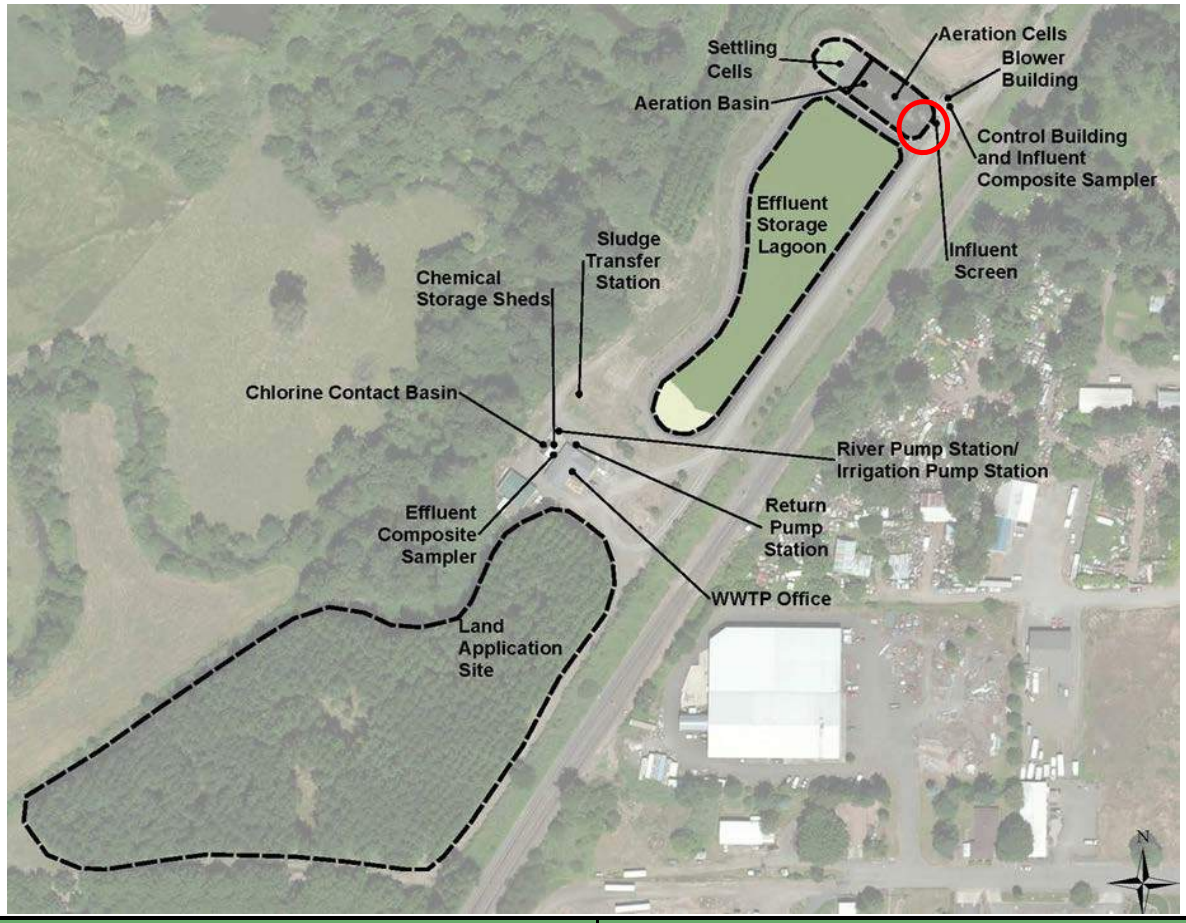
Item	Cost (2019)	
Permanent Irrigation System	$	30,000
Mobilization (10%)	$	3,000
Overhead and Profit (15%)	$	5,000
Contingency (30%)	$	9,000
Construction Subtotal	**$**	**47,000**
Soft Costs (25%)	$	12,000
Total Project Cost	**$**	**59,000**

Wastewater Facilities Project: **Headworks Grit Removal**

Project Identifier: **2.6**

Objective: Upgrade the headworks to include grit removal.

Project Location: Headworks



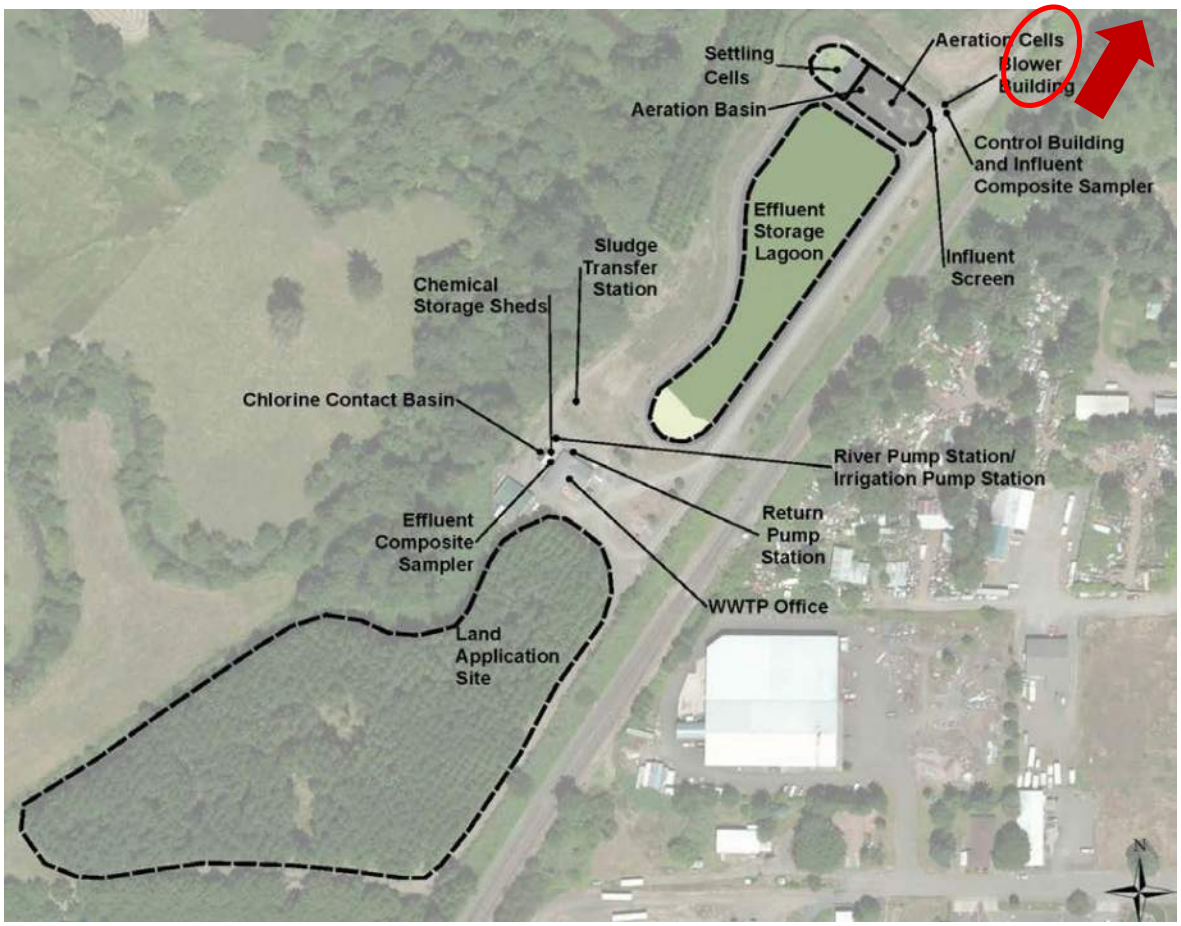
Item	Cost (2019)
Grit Chamber and Classifier	$ 420,000
Electrical/Controls	$ 90,000
Mobilization (10%)	$ 60,000
Overhead and Profit (15%)	$ 80,000
Contingency (30%)	$ 160,000
Construction Subtotal	**$ 810,000**
Soft Costs (25%)	$ 203,000
Total Project Cost	**$ 1,013,000**

Wastewater Facilities Project: **Paving Access Road**

Project Identifier: **2.7**

Objective: Pave the access road from the WWTP to Ehlen Road.

Project Location: Access Road to WWTP



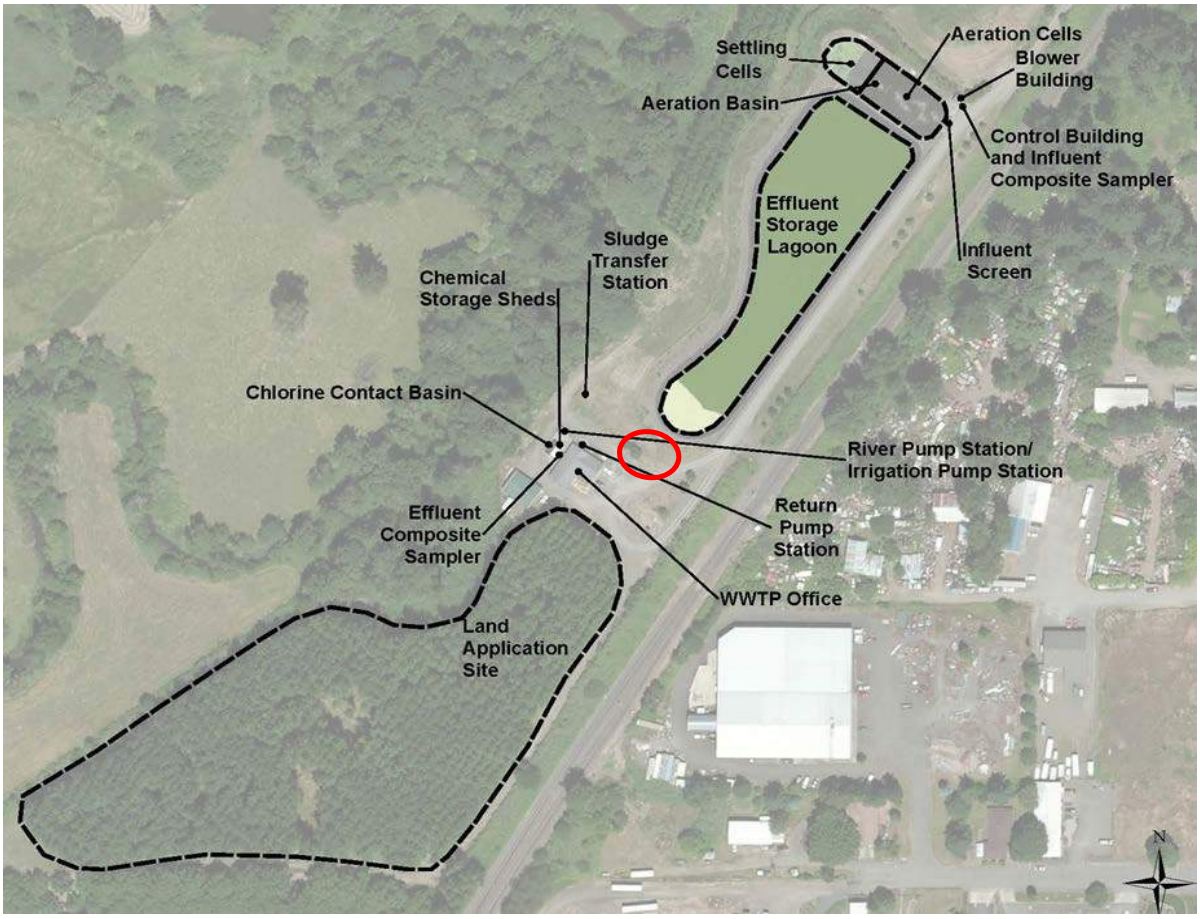
Item	Cost (2019)	
Asphalt Pavement	$	183,000
Mobilization (10%)	$	19,000
Overhead and Profit (15%)	$	28,000
Contingency (30%)	$	55,000
Construction Subtotal	**$**	**285,000**
Soft Costs (25%)	$	80,000
Total Project Cost	**$**	**365,000**

Wastewater Facilities Project: Tertiary Treatment

Project Identifier: 2.8

Objective: Either of two options - aeration, baffle walls, floating cover, and chlorine piping added to the Effluent Storage Lagoons, or a downstream filter - would be installed to improve the tertiary removal of TSS and BOD5. Filtration is shown since it has the higher project cost.

Project Location: Near WWTP Office



Item	Cost (2019)	
Site Work	$	21,000
Filters	$	400,000
Cover	$	10,000
Electrical/Controls	$	90,000
Mobilization (10%)	$	60,000
Overhead and Profit (15%)	$	80,000
Contingency (30%)	$	160,000
Construction Subtotal	**$**	**821,000**
Soft Costs (25%)	$	210,000
Total Project Cost	**$**	**1,031,000**