Notice of Public Works Committee Meeting

AGENDA

PUBLIC WORKS COMMITTEE - CITY OF FALLS CITY, OREGON

Meeting Location: 320 N Main Street, Falls City

Meeting Date: Tuesday March 18, 2014 7:30 p.m.

Posted on March 14, 2014

1) **Call to order**

A) Roll Call: Mike McConnell____ Guy Mack____ Michael Morales ____ Mayor Amy Houghtaling___
Julee Bishop____ John Volkmann____ Barbara Spencer _____

2) **Pledge of Allegiance**

3) **Motion to adopt the entire agenda**

4) **Consent Agenda: Motion Action Approving Consent Agenda Items**

A. Approval of Minutes of the Public Works Committee meeting February 18, 2014 (p. 1-9)

5) **Public Comments:** Citizens may address the Committee or introduce items for Committee consideration on any matters. The Committee may not be able to provide an immediate answer or response, but may direct staff to follow up on any questions raised. Out of respect to the Committee and others in attendance, please limit your comment to five (5) minutes. Please state your name and city of residence for the record.

6) **Old Business**

A. Wastewater Facilities Plan (p. 10-200)

7) **New Business**

A. Council Decisions on a Leak Adjustment Requests (p. 201-217)
B. Appointment of new City Councilor Dennis Sickles (p. 218)

8) **Correspondence, Comments and Ex-Officio Reports**

9) **Adjourn**

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City of Falls City
Public Works Committee Meeting
Tuesday February 18, 2014
Meeting Location: 320 N Main Street, Falls City, Oregon 97344

Committee Members Present
Guy Mack, Amy Houghtaling, Julee Bishop, Barbara Spencer, Mike McConnell

Staff Present
None

Council Present
Terry Ungricht

Committee Chair Houghtaling called the meeting to order at 7:30 p.m.

1) **Roll Call**
Committee Chair Houghtaling took roll call. Michael Morales and John Volkmann were absent.

2) **Pledge of Allegiance**

3) **Motion to adopt the entire agenda**
A motion was made by Committee Member Spencer and seconded by Committee Member Mack to adopt the entire agenda. Motion carried 5-0-0. Ayes: Guy Mack, Mayor Amy Houghtaling, Barbara Spencer, Julee Bishop, Mike McConnell

4) **Motion to approve consent agenda**
Mike McConnell requested an amendment to the January 14, 2014 Minutes of the Public Work Committee Meeting under Sweeper Update to insert "and follow along with a bucket to pick up debris from the brush".
A motion was made by Committee Member Spencer, seconded by Committee Member McConnell to approve the consent agenda with an amendment to the January 14, 2014 Public Works Minutes under Old Business Sweeper Update inserting "and follow along with a bucket to pick up debris from the brush". Motion Carried 5-0-0 Ayes: Guy Mack, Mayor Amy Houghtaling, Barbara Spencer, Julee Bishop, Mike McConnell

5) **Public Comments**
None

6) **Old Business:**
A. Consider "Ready to Serve" water rates
An additional Agenda Report titled Consider "Ready to Serve" Water Billing Rate – Additional Info was distributed to Committee Members (Exhibit A)

Committee Member McConnell apprised the committee on various water rates around Polk County and how other cities handle issues that were brought forth to the committee under the "ready to serve" model. The information was enlightening. Unfortunately, because of our population and water fund we have a very different story in Falls City.

P. 1

A motion was made by Committee Member Mack, seconded by Committee Member Spencer to support the monthly billing of Capital Improvement Fee for any account with a water meter or sewer connection. Motion Carried 4-1-0 Ayes: Guy Mack, Mayor Amy Houghtaling, Barbara Spencer, Mike McConnell. Nays: Julee Bishop

A motion was made by Committee Member Houghtaling, seconded by Committee Member McConnell to support the monthly billing of inactive meters at properties with habitable homes. Motion Carried 5-0-0 Ayes: Guy Mack, Mayor Amy Houghtaling, Barbara Spencer, Julee Bishop, Mike McConnell

B. Wastewater Facilities Plan update
The committee was pleased to hear the plan was accepted by DEQ.

C. Follow up on Committee Questions
The committee appreciated the follow up.

7) New Business:

A) Staff Decision on a Leak adjustment Request
The committee appreciated being informed.

B) Emergency Plan Update
The committee appreciated the information.

C) Spring clean
Mayor Houghtaling encouraged volunteers to sign up right away so that city staff can focus on other parts of the spring clean. Mayor Houghtaling also encouraged volunteers to help make phone calls for the event. It is a great event but involves a lot of staff time.

8) Correspondence, Comments and Ex-Officio Reports
None

9) Adjourn
A motion was made by Committee Member Mack and seconded by Committee Member Bishop to adjourn the meeting at 8:51 p.m. Motion carried 5-0-0. Ayes: Guy Mack, Mayor Amy Houghtaling, Julee Bishop, Barbara Spencer, Mike McConnell

The meeting was adjourned at 8:51 pm

_____ Public Works Committee Chair Amy Houghtaling

Attested: _____ Public Works Committee Member _____

Exhibit A

AGENDA REPORT

TO: PUBLIC WORKS COMMITTEE
FROM: DOMENICA PROTHEROE
SUBJECT: CONSIDER "READY TO SERVE" WATER BILLING RATE – ADDITIONAL INFO
DATE: 02/18/2014

SUMMARY

Committee Member Mike McConnell requested the fee schedule for a water shut off and reconnection.

The city charges a water reconnection fee if a customer has been shut off for nonpayment. The fee is $35 to reconnect water during normal business hours and $65 to reconnect water outside of regular business hours. Regular business hours are Monday – Thursday 7:00 AM to 5:30 PM, Friday 7:00 AM to 4:30 PM, except on Holidays.

Another cost the committee may want to consider is the cost to remove a water meter at the request of the property owner. If a customer requested the removal of a meter they would pay the actual cost to remove the meter, e.g., labor cost, and material cost to cap the connection. If that customer wanted a meter at a future date they would pay for a new water meter. See Resolution 2013 05-05 for the cost of a new water meter.

BACKGROUND

FINANCIAL IMPACTS:

STAFF RECOMMENDATION

EXHIBIT

Exhibit A – Resolution 2013-22—Water Service and related charges
Exhibit B – Resolution 05-05 Sewer and Water Utility service connection fees

PROPOSED MOTION

RESOLUTION NO. 2013-22 Exhibit A

A RESOLUTION DETAILING FEES FOR WATER SERVICE AND RELATED CHARGES; AND REPEALING PRIOR RESOLUTION.

Findings:

1. The Falls City Budget Committee has undertaken a review of water user rates and recommended an eight percent rate increase.

2. The Falls City Council, adopted the 2013-2014 Fiscal Year Budget which included an eight percent water user rates increase.

3. Ordinance 98-471 authorizes the Falls City Council to establish by resolution, and from time to time amend, water rates to be charged for each class of service, including minimum charges, charges for water consumption, service connection charges and all other related fees and charges.

4. Falls City has entered into grant and loan agreements with Oregon Rural Development and the Oregon Economic and Community Development Department (Business Oregon) that require the City to maintain a utility rate structure that will maintain the City's ability to meet its current and future loan obligations, provide for operations and maintenance of the City's water treatment plant and distribution system, and create reserves for future capital improvements, capital projects and major maintenance and repair.

5. The Falls City Council has determined that the rates and charges set forth in this resolution are appropriate and in the best interest of the City.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FALLS CITY:

Section 1. The rates for water use set forth in Exhibit 1 detail the eight percent increase in water user rates adopted by the 2013-2014 Fiscal Year budget and thereby made effective on July 1, 2013.

Section 2. Water furnished to water districts, cooperatives or corporations, organized and existing under the laws of the State of Oregon and receiving water through a master meter, shall pay therefor such amount as may be established by agreement between the City and the water districts, cooperatives or corporations, fire districts or departments, or other persons or entities prior to receiving such water.

(a) Where an agreement is not in place, and where bulk water is needed, the established Bulk Water Rate will be charged according to the size of the tanker truck or vessel; and

(b) Payment in advance is required for the sale of bulk water where a written agreement is not in place; and

(c) Sale of bulk water without a written agreement is a privilege and can be denied or revoked at any time.

Section 3. In addition to the monthly fees established herein, the following service fees are hereby established:

(a) Reconnection fee during regular business hours.....$35.00

(b) Reconnection fee during other than regular business hours $65.00

(c) Setup connection fee for sale of bulk water where a written agreement is not in place $50.00

(d) Returned check fee $25.00

(e) Payment Late fee $10.00

Section 4. In addition to the monthly fees established herein, a Capital Improvement Fee shall be assessed each month on each active service account in the amount of $7.00. When both a residence and a commercial operation or development exist on a property zoned Commercial Residential, the Capital Improvement Fee will be assessed separately for both the residence and the commercial operation or development.

Section 5. In addition to the monthly fees established herein, a Backflow Testing Fee shall be assessed each month on each service account in the amount of $3.50 through June 30, 2014 and reduced to $2.25 from July 1, 2014 through June 30, 2018.

Section 6. Resolution 2012-13 is repealed on the effective date of this resolution. All other resolutions and parts of resolutions relating to water use rates and related charges not repealed or amended expressly or by implication by resolution shall continue in full force and effect.

ADOPTED BY THE FALLS CITY COUNCIL ON THIS 10TH DAY OF OCTOBER 2013.

VOTE: AYE____ NAY____ ABSTAIN____ ABSENT____

_____ _____

Amy Houghtaling, Mayor Date

ATTEST:

_____ _____

Amber Mathiesen, City Administrator/Recorder Date

City of Falls City
"Exhibit 1"
Water Service Rate Table

Definition: 1 Water Unit = 1000 gallons

Residential - Inside City Limits (RI)

Size of Meter	Consumption	**Base Rate**
5/8" METER	5 Units	39.96
1" METER	5 Units	61.56
1 1/2" METER	5 Units	69.12
2" METER	5 Units	82.08
3" METER	5 Units	101.52
4" METER	5 Units	144.72
Overage: Consumption shall be charged at **$2.43** per Unit over 5 Units		

Residential - Outside City Limits (RO)

Size of Meter	Consumption	**Base Rate**
5/8" METER	5 Units	44.82
1" METER	5 Units	66.42
1 1/2" METER	5 Units	73.98
2" METER	5 Units	88.02
3" METER	5 Units	106.38
4" METER	5 Units	149.58
Overage: Consumption shall be charged at **$2.70** per Unit over 5 Units		

Residential/Commercial – Inside City Limits (RCI)

Size of Meter	Consumption	**Base Rate**
5/8" METER	5 Units	61.56
1" METER	5 Units	83.16
1 1/2" METER	5 Units	91.80
2" METER	5 Units	103.68
3" METER	5 Units	123.12
4" METER	5 Units	166.32
Overage: Consumption shall be charged at **$2.97** per Unit over 5 Units		

Residential/Commercial – Outside City Limits (RCO)

Size of Meter	Consumption	**New Base Rate**
5/8" METER	5 Units	66.42
1" METER	5 Units	88.02
1 1/2" METER	5 Units	96.66
2" METER	5 Units	108.54
3" METER	5 Units	127.98
4" METER	5 Units	171.18
Overage: Consumption shall be charged at **$2.97** per Unit over 5 Units		

City of Falls City
"Exhibit 1"
Water Service Rate Table

Non-Residential Commercial – Inside City Limits (NCI)

Size of Meter	Consumption	**Base Rate**
5/8" METER	5 Units	61.56
1" METER	5 Units	83.16
1 1/2" METER	5 Units	91.80
2" METER	5 Units	103.68
3" METER	5 Units	123.12
4" METER	5 Units	166.32
Overage: Consumption shall be charged at **$2.97** per Unit over 5 Units		

Non-Residential Commercial – Outside City Limits (NCO)

Size of Meter	Consumption	**Base Rate**
5/8" METER	5 Units	66.42
1" METER	5 Units	88.02
1 1/2" METER	5 Units	96.66
2" METER	5 Units	108.54
3" METER	5 Units	127.98
4" METER	5 Units	171.18
Overage: Consumption shall be charged at **$2.97** per Unit over 5 Units		

2 Meters-Outside (2MO)

Size of Meter	Consumption	**Base Rate**
5/8" METER	5 Units	75.60
Overage: Consumption shall be charged at **$2.43** per Unit over 5 Units		

Exhibit B

CITY OF FALLS CITY

Resolution No. 05-05

A Resolution amending the Sewer and Water Utility Service Connection Fees and Deposits and reaffirming the actions taken by Falls City Council at a City Council meeting dated June 7, 2004.

WHEREAS, under Ordinance no. 420, Article VI, Section 1, the City Council shall establish a sewer utility connection fee schedule which it may change from time to time; and

WHEREAS, under Ordinance 98-471, Section 7.3, the minimum water service connection charge shall be established by Resolution of the Council; and

WHEREAS, at a regularly scheduled meeting dated June 2, 2004, the Utility Advisory Board has recommended to the City Council a significant increase in sewer and water utility service connection fees to meet current installation costs; and

WHEREAS, the City Council finds the following rates and fees are fair and equitable; and

WHEREAS, the City Council did take action at a regularly scheduled City Council meeting dated June 7, 2004 to adopt the following service connection fees and deposits; and

WHEREAS, the City has been unable to locate a signed copy of the Resolution establishing new sewer and water service connection fees and deposits adopted at the June 7, 2004 City Council meeting,

NOW, THEREFORE, BE IT RESOLVED
That the connection fees for the costs of connecting any property to the sewer and water system needs to be collected in advance, and;

That the following Sewer and Water utility service connection fees are to be effective June 7, 2004:

Sewer Service Connection Fees:

a.	Connection Fees -	Simple:	Facility rate of $2500 plus customer will be responsible for over 20 feet at $40.00 per foot and/or cost plus.

Complex: Facility rate of $4000 plus customer will be responsible for over 20 feet at $40.00 per foot and/or cost plus

Water Service Connection Fees:

a. Connection Fees - Simple: Facility rate of $1250 plus customer will be responsible for over 20 feet at $40.00 per foot and/or cost plus.

Complex: Facility rate of $1500 plus customer will be responsible for over 20 feet at $40.00 per foot and/or cost plus

NOW, THEREFORE, BE IT RESOLVED that the City of Falls City does hereby amend its Sewer and Water Utility Service Connection Fees effective June 7, 2004;

Yeas: 4 Nays: ϕ Abstentions: 1 Absent: ϕ

ADOPTED BY THE FALLS CITY COUNCIL at its regular council meeting on this 11th day of July, 2005.

July 11, 2004
Date

Darrin Fleener, Mayor

Attest:

July 11, 2004
Date

Darla J. Williams
City Recorder/Finance Officer

Attachments:

A – Ordinance No. 420
B - Ordinance No. 98-471
C - Memo regarding UAB recommendations June 22, 2005
D - City Council Meeting Minutes June 7, 2004

P.9.

AGENDA REPORT

TO: MAYOR AND COUNCIL

FROM: AMBER MATHIESEN, CITY ADMINISTRATOR

SUBJECT: WASTEWATER FACILITIES PLAN

DATE: 02/04/2014

SUMMARY

The City of Falls City is completing a Wastewater Plan Update project funded with Community Development Block Grant funds from the Oregon Economic and Community Development Department.

BACKGROUND

The City conducted several public meetings for the purpose of citizen involvement. The plan has been reviewed by the Oregon Department of Environmental Quality and has met their stringent standards for a Wastewater Facilities Plan.

PREVIOUS COUNCIL ACTION

The City Council accepted the Community Development Block Grant funds from the Oregon Economic and Community Development Department for developing the plan and selected the engineering firm for the project. Council has heard several progress reports and authorized public meetings to gather citizen input.

ALTERNATIVES/FINANCIAL IMPLICATIONS

The Council could choose to reject the plan. It is unknown if this would result in a required repayment of the grant.

STAFF RECCOMENDATION

Adopt Ordinance 535-2014

EXHIBIT

Exhibit A - Public Hearing Notice
Exhibit B - Public Hearing Script
Exhibit C – Ordinance 535-2014
Exhibit D - Wastewater Facilities Plan

PROPOSED MOTIONS

I move the City Council of the City of Falls City read Ordinance 535-2014 adopting a Wastewater Facilities Plan, for first reading.

2nd PUBLIC HEARING SCRIPT

OPEN HEARING

This hearing is being held as part of the Community Development Block Grant closeout process. The City was awarded $106,500 in Community Development Block Grant funds to help in the update to their Wastewater Master Plan to benefit the City of Falls City.

The purpose of the hearing is:

1) for the City Council to review the results of the project with citizens,
2) And for the City Council to obtain citizen views and comments about the local governments performance on the project.

Are there any questions or comments on this project?

TAKE COMMENTS AND QUESTIONS

CLOSE HEARING

ORDINANCE 535-2014

AN ORDINANCE OF THE CITY OF FALLS CITY ADOPTING A WASTEWATER FACILITIES PLAN FOR THE CITY OF FALLS CITY, OREGON;

NOW THEREFORE THE CITY OF FALLS CITY ORDAINS AS FOLLOWS:

Section 1. The City of Falls City Contracted with J.D McGee to develop a Waste Water Facilities Plan for Falls City.

Section 2. J.D. McGee developed and presented a Waste Water Facilities Plan.

Section 3. The Plan has been reviewed and approved by City Staff and the Oregon Department of Environmental Quality.

Section 4. On March 13, 2013 the City Council of Falls City held a public hearing to take public testimony on the Plan.

Section 5. Effective Date. The City Council for the City of Falls City completed its first reading of Ordinance on March 13, 2014; with a second reading April 10, 2014., the City of Falls City notes that this Ordinance becomes effective within thirty (30) days, and therefore, this Ordinance shall be in full force and effect May 10, 2014.

First Reading: March 13, 2014 Second Reading: April 10, 2014

First reading PASSED by the City Council of the City of Falls City on this 13th day of March 2014, by the following votes. AYES:_____ NAYS:_____

Second reading PASSED by the City Council of the City of Falls City on this 10th day of April 2014, by the following votes. AYES:_____ NAYS:_____

Attest:

_____ _____

Mayor Amy Houghtaling Amber Mathiesen, City Recorder/Administrator

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PUBLIC HEARING NOTICE

The City of Falls City is completing a Wastewater Plan Update project funded with Community Development Block Grant funds from the Oregon Economic and Community Development Department. The location of the project is: City of Falls City. It is estimated that the project has benefited at least 1,026 persons of whom 52.6% are low or moderate income.

A public hearing will be held by the City Council at 7:30 p.m. on Thursday, March 13, 2014 at the location of: Falls City Community Center, 320 N. Main Street, Falls City OR 97344.

The purpose of the hearing is for the City Council to obtain citizen views about the project and to take comments about the local government's performance. Written comments are also welcome and must be received by 5 p.m. on March 13, 2014 at Falls City Hall, 299 Mill Street, Falls City OR 97344. Both oral and written comments will be reviewed by the City Council.

The location of the hearing is accessible to the disabled. Please let Amber Mathiesen, City Administrator at 503-787-3631 know if you need any special accommodations to attend or participate in the hearing.

More information about the Oregon Community Development Block Grant program and the project is available for public review at Falls City Hall, 299 Mill Street, Falls City during regular office hours. Advance notice is requested. If special accommodations are needed, please notify Amber Mathiesen, City Administrator at 503-787-3631 so that appropriate assistance can be provided.

JD McGEE, Inc.

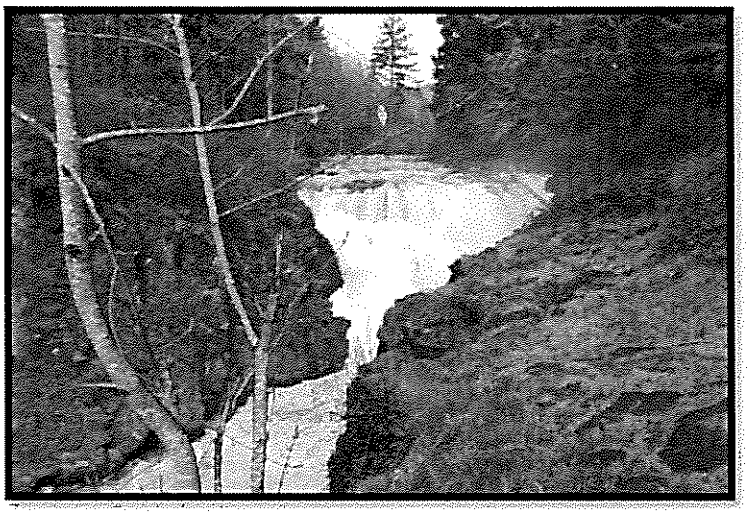
JD McGee, Inc.
ENGINEERING & SURVEYING
1215 Main St.
Philomath, OR

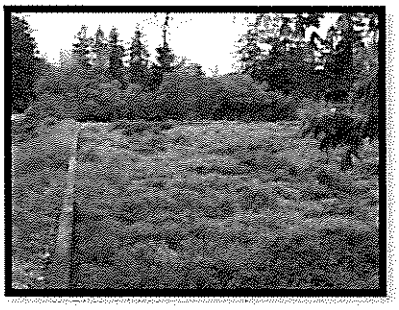
Teamed with

HBH Consulting Engineers

And

Envirotech Northwest, Inc.





Wastewater Facility Plan

City of Falls City

December, 2013

Work under this contract was funded in its entirety with federal grant funds from the Oregon Community Development Block Grant program.

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Appendix D: Maintenance Records and Observations
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Appendix F: Record of Potential Health Issue
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1 EXECUTIVE SUMMARY

On November 8, 2012, following the presentation of the 50% Wastewater Facility Plan, the City Council voted to focus the majority of planning effort toward the two-cell lagoon development alternative (Alternative 3). The council decision was based on:

- The desire to move effluent disposal away from the High School football field; and
- The goal of minimizing the financial impact to users by maximizing available grant funds.

The expandability of a lagoon system to provide for future capacity increases was also attractive to the Council. The two-cell lagoon treatment system would be sited east of the City with a new outfall to the Luckiamute located downstream of the existing outfall. A chlorine disinfection system will disinfect treated effluent prior to discharge. A new NPDES permit will need to be issued, with standard discharge requirements of 30 mg/l BOD5 and 30 mg/l TSS. It is expected that the new permit would not limit winter flows to the river. Two potential sites have been identified but negotiations for property purchase, easement or lease have not been undertaken. The two-cell lagoon alternative would require a new outfall into the Little Luckiamute River.

In addition to replacement of the treatment system, the collection system will be enhanced by removal of the Fairoaks pump station and installation of a replacement gravity collection line. Since this improvement would benefit either the current or the new treatment system, it is expected that this portion of the project will have priority.

Preferred alternate project costs and rate changes are described in Section 9.

The existing treatment system is commonly referred to as a Septic Tank Effluent Gravity (STEG) system, although some homes are served by a Septic Tank Effluent Pump (STEP) system. As the names suggest, treatment begins at the user's property with a septic tank (primary treatment). Septic tank effluent, which throughout this report will be referred to as STEP/STEG sewage, is collected and transported in pipes to the Recirculating Gravel Filter (RGF) for secondary treatment. Effluent from the RGF is then either discharged into an absorption area under the High School football field or disinfected with Ultraviolet (UV) light and discharged to the Little Luckiamute River.

The system was constructed in two major phases beginning in the mid-1980s. The first phase included construction of the RGF and the drainfield disposal area. All treated effluent was routed to an absorption area located under the High School football field under a DEQ Water Pollution Control Facility (WPCF) permit. DEQ's on-site rules are very specific regarding the amount of STEP/STEG sewage that can be treated using RGF treatment and the amount of effluent that can be discharged into the absorption area.

The second phase of sewer improvements added treatment components that allowed discharge to the Little Luckiamute River and which changed the permit from a WPCF to a National Pollutant Discharge Elimination System (NPDES).

Although the existing facility has historically met standard permit discharge limits, the system is operating outside the current DEQ On-site design standards. Under DEQ's surface water discharge guidelines, if the discharge water quality limits are not exceeded with some level of frequency, then the system is operating correctly. Conversely, DEQ on-site design rules are based on the volume of water that any component of the system can accommodate during a 24-hour period.

Based on current DEQ on-site design standards for recirculating gravel filters (RGF) (OAR 340-071-0302), which do not apply but are provided as an indication of how the system was originally designed, the capacity is limited to a maximum 37,500 gallon per day flow. During wet-weather the actual flows have been recorded at almost double the RGF capacity according to on-site rules. The additional flow (hydraulic overloading) is due to Infiltration and Inflow (I/I). Flow volumes listed in Schedule A of the expired NPDES permit (which remains in effect until DEQ issues a new permit) are limited to 0.02625 MGD to the river from May 1 – October 31 and 0.0532 MGD to the absorption drainfield throughout the year.

Z-1

To achieve the City's goal of removing the disposal area from the football field, alternate disposal locations were considered. Using on-site rules as a guide, it was determined that a new disposal field with replacement area would require approximately 6 acres of land with suitable soil and topography. The two-cell lagoon system will take 5 acres and provides capacity for expansion. As a result, relocation of the drainfield was dismissed because it would require 20% more property than the lagoon system and relocation in itself would not offer the desired capacity expandability.

It is possible to expand the current filter system with newer modular units, but there is little or no upfront cost advantage and the football field would continue to be the disposal area which is undesirable, unless property was acquired for new disposal areas. Infiltration is defined as indirect sources of stormwater or ground water (clear water) infiltrating into the sanitary sewer system. Examples of infiltration points include:

- Defective pipes and joints (cracked, broken, misaligned, etc.) in the public STEP/STEG sewer system.
- Defective pipes and joints in the property owners' sewer service lines.
- Defective and deteriorated 4-foot-diameter segment precast concrete (manhole) pump station.

Inflow is defined as direct sources of clear water entering the sanitary sewer system. Examples of inflow points include:

- Building footing and foundation drains connected to sanitary sewer service lines.
- Sump pumps connected to sanitary sewer service lines.
- Window well drains, stairway drains, yard drains, roof drains, foundation drains and patio drains connected to sanitary sewer service lines.
- Storm sewers and storm inlets connected to the public STEP/STEG sewer system.
- Open entry points like sewer cleanouts, etc.

I/I reduction continues to be a City Council goal although it is recognized that 100% elimination is highly unlikely. Private system components are often found to be a significant I/I contributor and quite often are difficult to isolate and eliminate. The Public Works department has indicated desires to investigate the deficiencies listed in this report and have expressed interest in developing a system inspection program.

The Fairoaks pump station has been identified as a source of I/I and it also has been a maintenance concern for several years. During the March 2012 site visit, groundwater was observed leaking through the joints in the 4-foot diameter segmental precast concrete wet well. As a result, it is recommended that the pump station be replaced with a gravity line in the right-of-way of Fairoaks and Ellis Streets.

It is doubtful that I/I can be completely eliminated. The City has attempted to detect I/I sources on at least two occasions by smoke-testing and TV camera sewer line inspection with inconclusive results. Sources of I/I like aging pipe-joints, private sewer line components on private property, septic tanks not tested for water-tightness during installation are difficult to identify and repair or replace, so significant I/I reduction is not considered feasible. As a result, a lagoon system was determined to be the best fit for Falls City.

During the preliminary engineering review for the lagoon alternative, it was determined that sites east of Falls City offer the best and least expensive construction options. The collection system will continue to deliver STEP/STEG sewage to the current cast-in-place recirculation tank. The tank will be converted to a pump station which will push STEP/STEG sewage through a new-construction transmission line to the new lagoon location. Re-use of the recirculation tank as a pump station will be further examined during pre-design to evaluate cost savings.

Other components of the existing system, including the recirculating gravel filter and drainfield will be abandoned in place since they present minimal public health risk.

Even though efforts will be ongoing to reduce I/I, the lagoon will be designed to store and treat the current recorded peak flows plus a 20-year growth factor. As I/I reduction efforts are realized the City will benefit by having capacity for additional sewer connections.

Two properties have been identified as potential lagoon sites. A letter describing the City's planning efforts was sent to each owner both responded, by telephone, favorably. Preliminary site visits to each property were conducted. The property owners were invited to attend the site walk.

During final engineering design, consideration will be given to future expansion of the system to accommodate City sewerage requirements for the period beyond the 20-year design.

Collection system O&M costs, adjusted for inflation, will remain similar to current costs. Homes will continue to be connected to septic tanks which are connected to the collection system. The septic tanks will still need to be pumped and maintained.

Funding options and projections are discussed in detail later in this report.

2 INTRODUCTION, PURPOSE AND NEED

JD McGee, Inc., Engineering and Surveying, has teamed with HBH Consulting Engineers and Envirotech Northwest, Inc. to provide the best possible value for the City in their Wastewater Facility Plan.

- John McGee, P.E. (JD McGee, Inc.) is the City's contract Engineer and has significant experience with recirculating filter systems.

- HBH Consulting Engineers has designed numerous wastewater treatment facilities, facility upgrades and sewage pump stations, including systems for the Cities of Amity, Willamina, Rockaway Beach and Sheridan.

- Dan Bush REHS (Envirotech Northwest, Inc.) is a leading authority in the State of Oregon on troubleshooting as well as operations and maintenance of recirculating gravel and recirculating fixed media systems.

The team's overall goal was to identify problems with the existing system; identify solutions for the problems; evaluate the feasibility of solutions; and make recommendations to the City.

2.1 OBJECTIVES

The City Council expressed the following objectives to be used as stepping stones toward creating a unique Falls City Wastewater Facility plan.

- **Objective 1:** The desire to move effluent disposal away from the High School football field.
- **Objective 2:** The goal of minimizing the financial impact to users by maximizing available grant funds.
- **Objective 3:** Adopting a plan that provides for future capacity increases.

2.2 APPROACH

Our team approach was to work closely with Falls City. We had several meetings with city staff and other interested parties to get a clear understanding of what was anticipated and needed in the current wastewater plan. We met with the public works department (PW) regularly to gain knowledge of the existing system while also discovering maintenance issues that needed to be addressed. After acquiring the City's institutional knowledge, our team approach included:

- Evaluation of the existing system;
- Determination of regulatory requirements;
- Analysis of potential alternatives to meet permit requirements;
- Proposing a plan;
- Exploring financial alternatives.

3 STUDY AREA CHARACTERISTICS

3.1 STUDY AREA

Falls City is located in Polk County, Oregon. The area of study is located within the incorporated city limits as seen in Figure 3-1 below. The Urban Growth Boundary (UGB) for Falls City is defined the same as the incorporated city limits and was set in 1979.

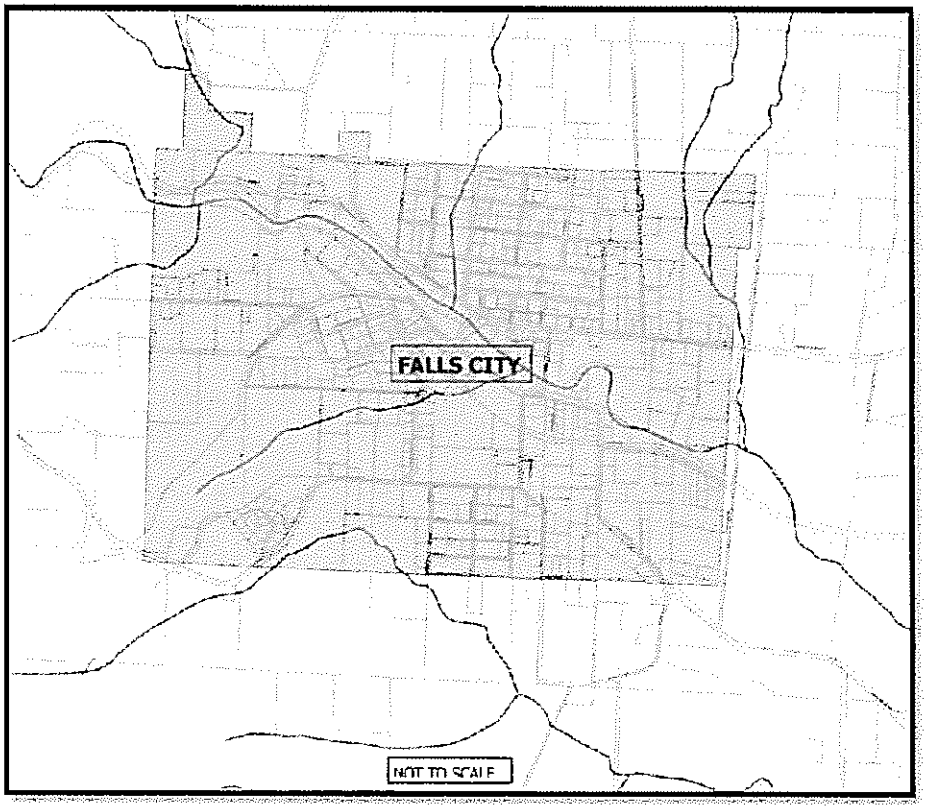


Figure 3-1: Falls City's incorporated city limits (Urban Growth Boundary).

3.2 PHYSICAL ENVIRONMENT

3.2.1 CLIMATE

The climate of Falls City is classified as being relatively mild with cool/wet winters and warm dry summers. The climate conditions closely resemble Mediterranean climates with cooler/wetter winters (Climate of Polk County). Falls City, OR receives 67 inches of rain per year (Western Regional Climate Center). The average snowfall is 11 inches per year (Western Regional Climate Center). The highest recorded daily rainfall, 5.84 inches, occurred in Falls City on February 10, 1949 according to the Oregon State Climate Service. Figure 3-2 below shows the average total monthly precipitation for Falls City, OR from 8/1/1896 to 12/31/2011.

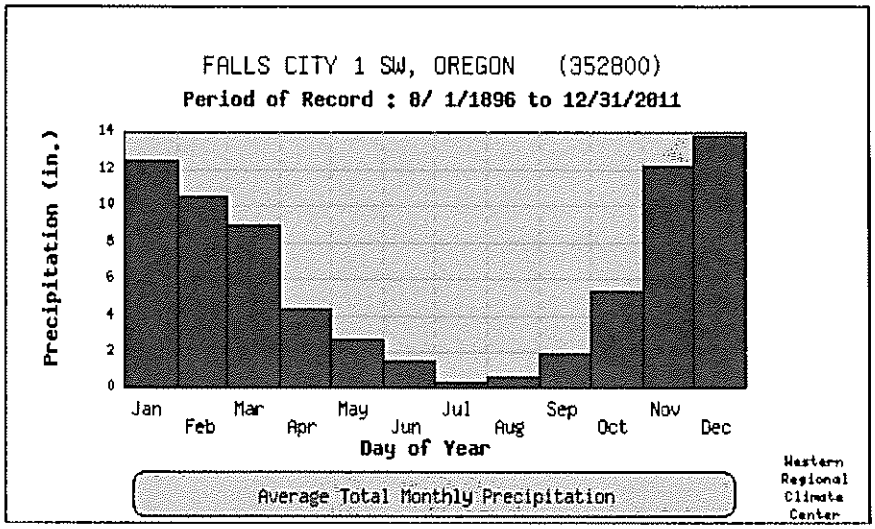


Figure 3-2: Average Total Monthly Precipitation for Falls City, OR (Source: Western Regional Climate Center)

3.2.2 SOILS

On-site sewer systems depend on the soil for disposal of septic system effluent. The current City collection and treatment system was developed to provide STEP/STEG sewage disposal for properties with less than suitable on-site disposal conditions.

The information used to identify the soil conditions for Falls City was obtained from the National Cooperative Soil Survey performed by the United States Department of Agriculture (USDA) and other Federal and State agencies. The report was generated on April 30, 2012; however, it is not clear when data was collected. Figure 3-3 below shows the soil map for Falls City. The soil in Falls City is predominantly made up of silty loam (well drained). The report also shows some silty clay loam (poorly drained) soils.

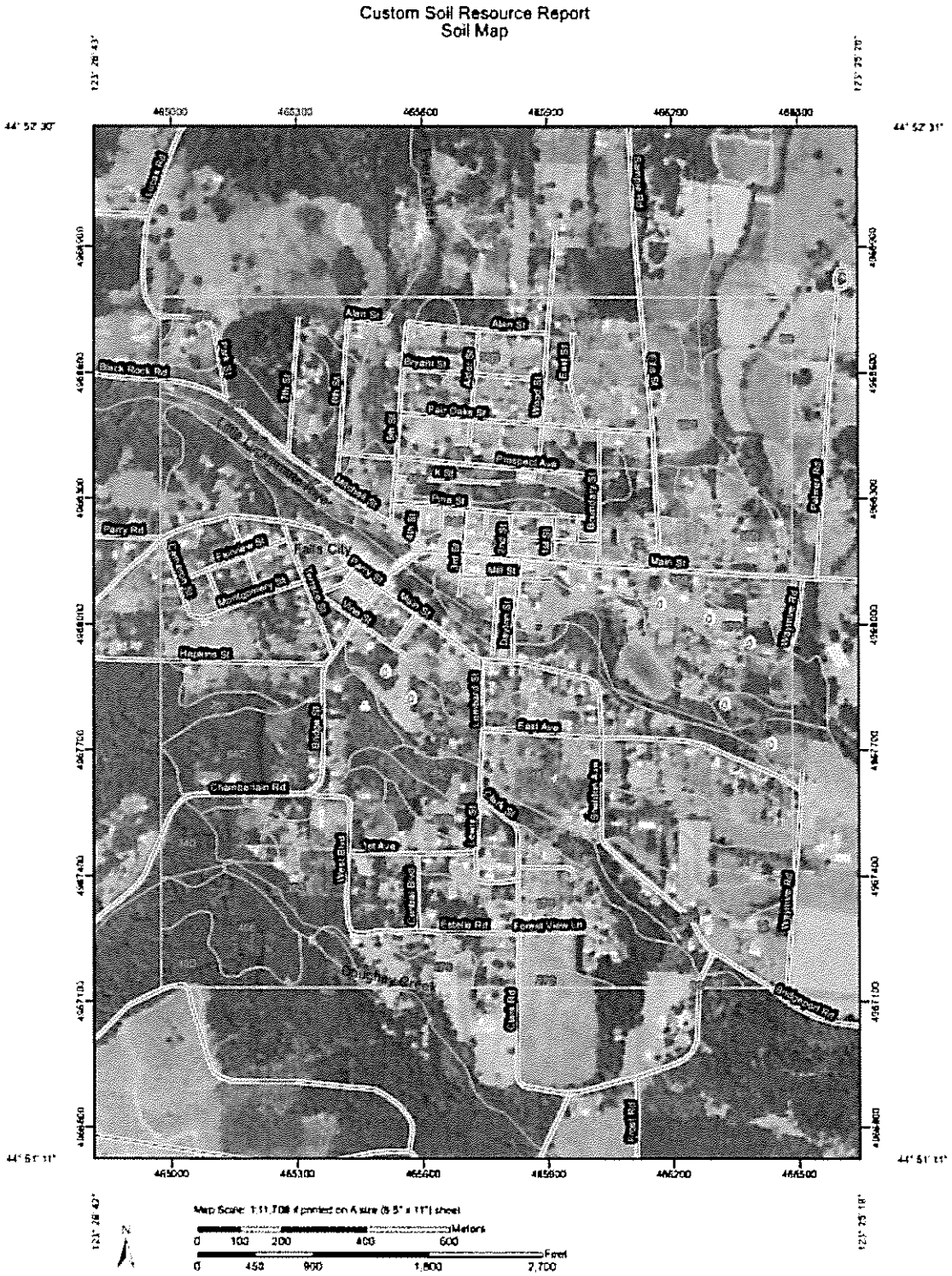


Figure 3-3: Soil Map. See Figure below for legend. An 11"x17" version of this map is included in Appendix H. (Source: National Cooperative Soil Survey)

Map Unit Legend

Polk County, Oregon (OR053)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8C	Bellpine silty clay loam	0.4	0.1%
12A	Briedwell silt loam	77.2	12.5%
13	Camas gravelly sandy loam	17.2	2.8%
15C	Chehulpum silt loam	4.8	0.8%
17	Cloquato silt loam	10.6	1.7%
18	Coburg silty clay loam	46.2	7.5%
27C	Dupee silt loam	9.7	1.6%
34D	Honeygrove silty clay loam	7.0	1.1%
35C	Jory silt loam	177.5	28.8%
35D	Jory silt loam	21.3	3.5%
35E	Jory silt loam	17.8	2.9%
36E	Jory silty clay loam	0.8	0.1%
40D	Kilowan gravelly silty clay loam	9.3	1.5%
40E	Kilowan gravelly silty clay loam	12.6	2.0%
64B	Salkum silty clay loam	11.0	1.8%
64C	Salkum silty clay loam	43.3	7.0%
67C	Steiwer silt loam	56.8	9.2%
67D	Steiwer silt loam	25.2	4.1%
68C	Suver silty clay loam	52.5	8.5%
72	Waldo silty clay loam	15.0	2.4%
Totals for Area of Interest		**616.2**	**100.0%**

Figure 3-4: Soil Map Legend and Percent of Soils by type (Source: National Cooperative Soil Survey)

3.2.3 GEOLOGIC HAZARDS

The purpose of this section is to give a clear understanding of the geological hazards that exist in Falls City.

Data on earthquake and landslide geological hazards was obtained from Oregon Department of Geology and Mineral Industries (DOGMI) interpretive map series 24 (IMS-24).

3.2.3.1 Flood Hazards

Figure 3-5 below shows the FEMA floodplain within the Falls City limits. Some portions of the wastewater system would be affected in a 100 year flood event. Areas affected may include residences on South Main Street and Dayton Street, as well as, significant flooding occurring at the existing treatment plant and drainfield.

Public Works reported that the 1996 flood event submerged the recirculation tank portion of the wastewater treatment facility. They also stated that the water receded very quickly and the tank was not submerged for very long.

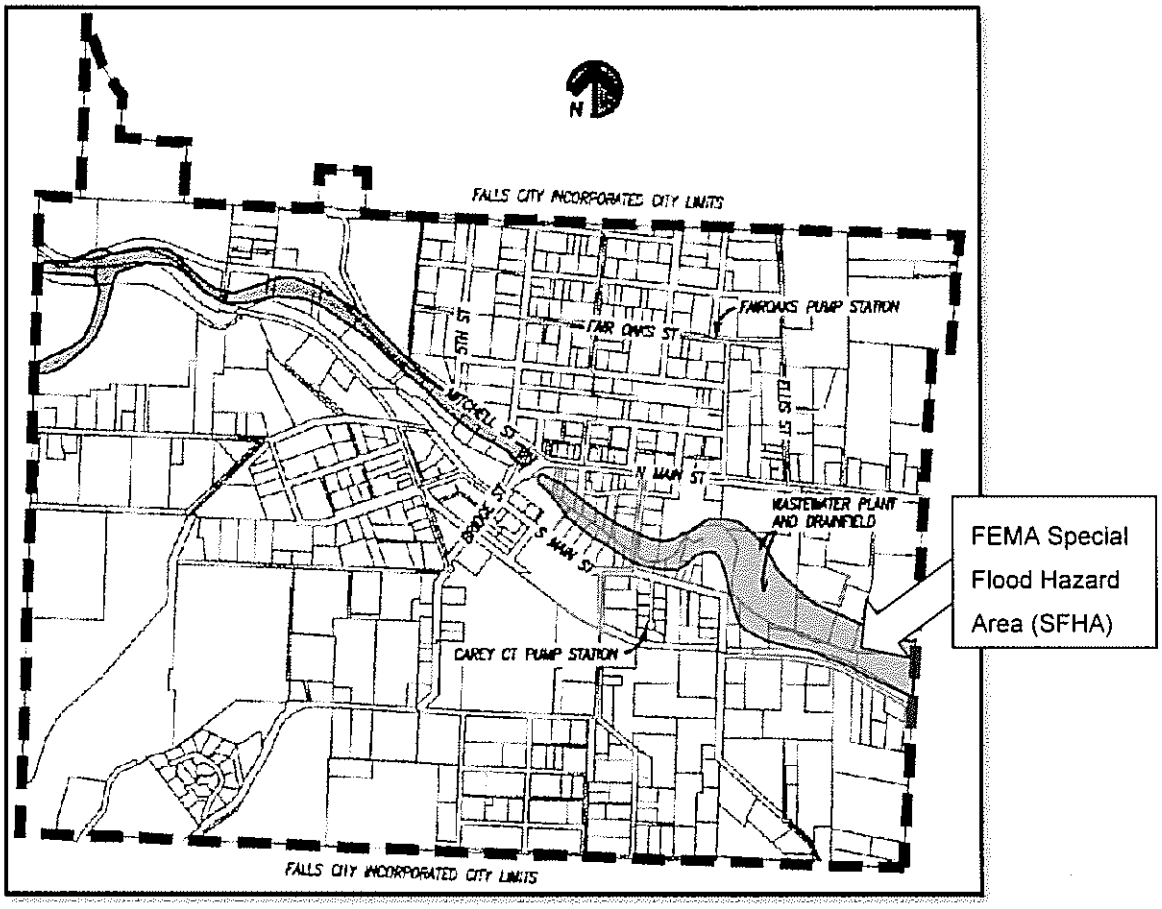


Figure 3-5: Floodplain Map (Source: Polk County GIS)

3.2.3.2 Earthquake Hazards

Liquefaction occurs when a soil is loaded so quickly (typically during an earthquake event) that the soil is unable to properly drain excess pore pressure and its strength decreases to the point where the soil starts to behave like a dense liquid. Liquefaction can cause severe damage to structures including wastewater facilities.

DOGMI classified Falls City as having rare to moderate potential for liquefaction. The moderate hazard area shown is along the river, which is also where the existing treatment facility and drainfield are located. Figure 3-6 below shows the hazard area map.

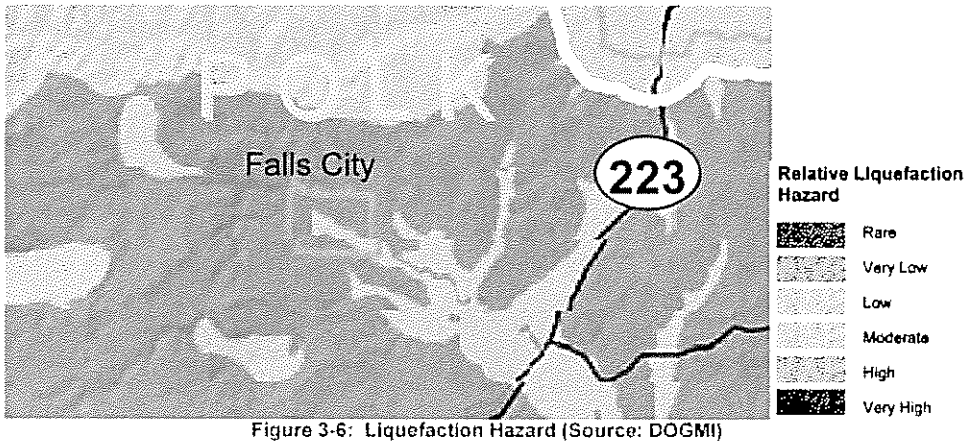


Figure 3-6: Liquefaction Hazard (Source: DOGMI)

Crustal Earthquake

The Mill Creek Fault is located approximately 20 miles to the southeast of Falls City. The Mill Creek Fault is a reverse-slip fault. DOGMI selected a magnitude 6.9 earthquake scenario caused by the Mill Creek Fault. Using that magnitude of earthquake, a peak ground acceleration (PGA) of 0.0-0.1 g's is expected in Falls City. This peak ground acceleration is relatively small.

3.2.3.2.1 Subduction Zone Earthquake

The Cascadia Subduction Zone is located approximately 70 miles off the Oregon coast. The subduction zone is caused by the Juan de Fuca Plate subducting under the North American plate. DOGMI selected a magnitude 9.0 earthquake scenario caused by the Cascadia Subduction Zone. The peak ground acceleration (PGA) caused by a magnitude 9.0 earthquake is expected to be 0.2-0.3 g's in Falls City.

Since no faults have been identified within the city limits, it is expected that damage to the collection system and/or the treatment system would be limited to issues caused by differential soil consolidation.

3.2.3.3 Landslide Hazards

Figure 3-7 below shows that there is a low to moderate potential for landslides in Falls City. There have been three nearby landslides identified to the west of Falls City. The identified landslides are not located within city limits.

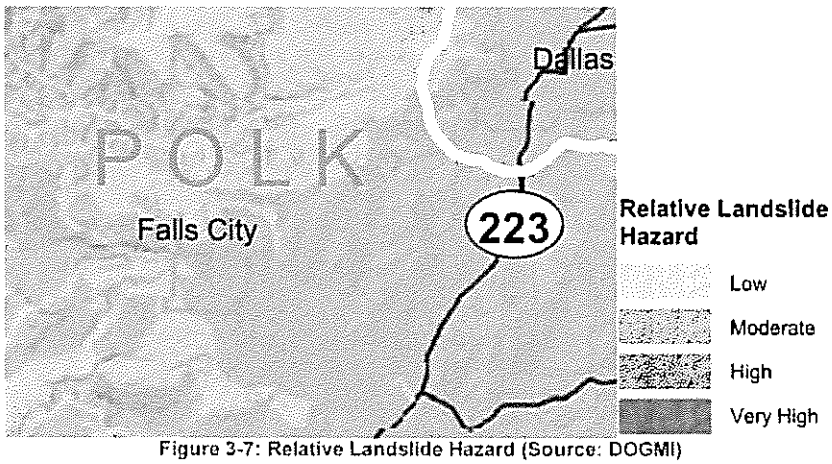


Figure 3-7: Relative Landslide Hazard (Source: DOGMI)

3.2.4 Public Health Hazards

There are two components of the City's collection and Treatment system that have a potential of the public to come into contact with constituents that could put public health at risk. The effluent disposal area, which is located under the high school football field, is one of the City's concerns. The other concern is the STEG/STEP sewer pump station, which is located on Fairoaks Street.

Standing water on the football field has been a concern to the City as recently as August 2011 and 2012. On August 26, 2011, Don Poe, the Wastewater Treatment Plant Supervisor, reported that the Falls City School District had irrigated the high school football field to the point of standing water on the palying surface. The concern was that drainfield effluent could contaminate the surface water. DEQ directed the City to obtain samples for E. coli testing. The test results, which indicated 600 colonies per 100 ml, were reported to DEQ and the City elected to allow football activities to resume. A letter from DEQ regarding this incident is included in Appendix F.

Also included in Appendix F is the correspondence associated with the 2012 surface water incident, which occurred during the writing of this plan.

The Fairoaks Street pump station has also been a concern. The City has reported overflow issues that resulted contamination of private property located down gradient from the pump station site. Reportedly, measures have been taken to enhance the pump station performance.

3.2.5 Energy Production and Consumption

Electric energy is provided to City facilities by Pacific Corp via a traditional grid system.

3.2.6 Water Resources

Falls City receives its water supply from Teal Creek and Glaze Creek drainage area. Water is extracted from the Falls City Reservoir located approximately 1.5 miles south of the incorporated city limits. Other notable water features include the Little Luckiamute River which splits the city. The Little Luckiamute River is permitted to receive up to 26,250 gallons/day of treated wastewater during the wet-weather months under the current NPDES permit.

3.2.7 Environmentally Sensitive Areas

The City does not have a current inventory of environmentally sensitive areas.

3.3 Socio-Economic Environment

3.3.1 Economic Conditions and Trends

While the current unemployment rate in Falls City is 8.1% which is below the national average of 8.2%, the mean household income for Falls City is $41,528 which is significantly less than the Polk County average of $59,050, the state average of $61,552 and the national average of $68,259 (2010 Census). There are a few commercial and industrial businesses located within the incorporated city limits. It is believed that the number of jobs available within the City is limited. It is assumed that most residents commute outside of the city for work.

3.3.2 Population

According to a study by Portland State University and data collected by the 2010 Census (latest data available) the population of Falls City was 945 people. There are currently 179* connections to the public wastewater system with some of these connections inactive. Much (61%) of the city's sewer needs are met by individual on-site disposal systems. Polk County has jurisdictional authority over individual on-site systems.

* Connection data obtained from Falls City.

3.3.3 Population Growth Projections

Falls City has adopted an Annual Average Growth Rate (AAGR) of 1.5% which calculates to a 2032 population of 1,311 (Coordinated Projection Rate as listed on Table 1, "Population Projections", Page 2-2, Polk County TSP 2009). A graph of the 2032 population projection can be seen in Figure 3-8 below. It should be noted that actual census data has shown the population decreasing at a rate of approximately 2.2% per year over the past decade. For the purpose of this wastewater plan we will use Falls City's adopted AAGR.

Using the average household size of 2.59 people (2010 Census) it is projected that there will be a potential need for 141 new homes over the next 20 years (7.86 homes/year). It is difficult to predict if these homes will be located within the wastewater limits of service. Currently 39% of the population located within the incorporated city limits are served by the wastewater facilities. A population increase of 366 people over the next 20 years and assuming that 39% of that population will continue to be served by the system results in an increase of 143 people or 55 new homes connected to the system.

While this plan is focused on the City's sewer system, for completeness it should be noted that 61% of the population is served by individual on-site sewer systems. Individual on-site sewer systems fall under the jurisdictional authority of Polk County so they will not be addressed in this plan. In general terms, individual on-site sewer systems work well given the relatively large land parcels and well drained soils found in most of Falls City. City Council guidance regarding the scope of this plan intentionally did not include all properties within the City limits. However, the City has expressed a desire to add connections to the City's system should one or more of the individual systems fail.

Under City Ordinance No. 420 ARTICLE III, Section 4 states:

> Except as stated in Section 6 below, the owner of all houses, buildings, or properties used for human occupancy, employment, recreation or other purposes situated within the City and abutting or within 200 feet of any street, alley, right-of-way or easement, in which there is now located or may in the future be located a community sewer belonging to the City, is hereby required at the owner's expense to install suitable facilities therein, including an interceptor tank as specified by the Sanitation Manager, and arrange for connection of such facilities directly to the community sewer system. Such connection shall be made under the direction of the Sanitation Manager within 90 days after official notice to do so.

Enforcement of that ordinance may also affect the number of future connections.

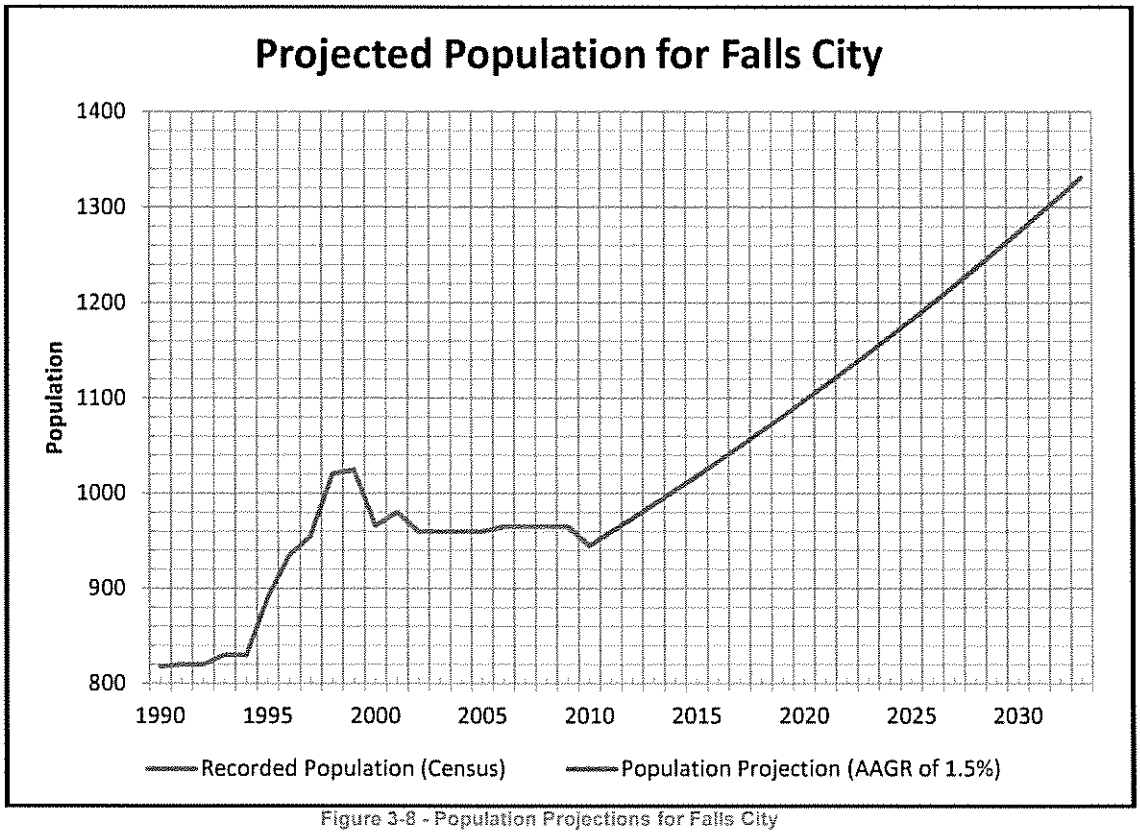


Figure 3-8 - Population Projections for Falls City

3.4 Land Use Regulations

3.4.1 City Comprehensive Plan

The City adopted a comprehensive plan in May 1979. The comprehensive plan was established to guide growth in Falls City and to establish land use goals and policies for land use planning, as well as, providing general guidance for developing zoning and development codes. The zoning and development code specifically regulates activities and development within City Limits. The comprehensive plan has been updated on two occasions. The current plan was revised and adopted by the City Council on August 19, 2010.

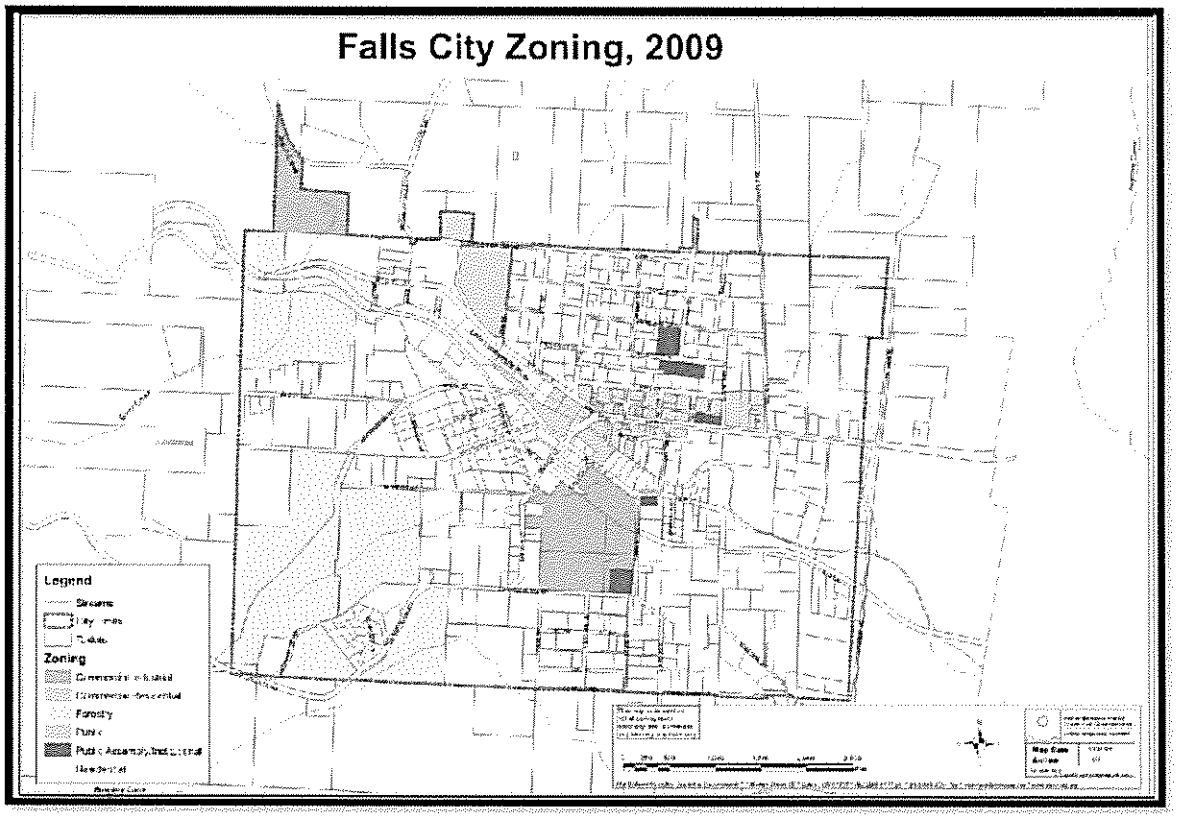


Figure 3-9 - Falls City Zoning (2009)

3.4.2 CITY ZONING ORDINANCE

The City of Falls City Zoning and Development Code (ZDC) has been adopted "to implement the goals and policies of the City of Falls City Comprehensive Land Use Plan through the adoption and coordination of planning and development regulations that provide for the health, safety and general welfare of the citizens of Falls City" (Falls City ZDC). Figure 3-9 above shows the 2009 zoning map for Falls City.

The City has adopted six development zones, as can be seen on the map in Figure 3-9. The ZDC zones include residential, commercial/residential, commercial/industrial, public open space, public assembly/institutional and forestry. The majority of the city is zoned residential.

4 EXISTING WASTEWATER SYSTEM

4.1 WASTEWATER CONVEYANCE SYSTEM

The collection system consists of a Septic Tank Effluent Gravity (STEG) system with some sections that are Septic Tank Effluent Pressure (STEP). It utilizes both commercial septic tanks and residential septic tanks. The facility was originally constructed in 1986.

Currently there are 179 connections (some inactive) to the wastewater system. There are a total of 151 septic tanks connected to the wastewater system as shown in Table 4-0 below:

Table 4-0: Septic Tank Count.

Tank Count	Volume (gallons)*
107	1000
2	1200
19	1250
15	1500
3	3000
5	Unknown size**
Total 151	

* Tank volumes were determined by reviewing original plans and the City's pumping records.

** Ten (10) tanks were listed on the original plans as "existing" without mention of volume. Volumes for those ten tanks were determined from pumping records submitted to DEQ. The City does not have pumping records or as-built drawings for five (5) tanks for determining the tank volume. There have been 14 new connections to the system since the 2002 Wallis Engineering Wastewater Facilities Plan.

The majority of the sewer mains and service laterals are constructed using 4" PVC, ASTM D3034 with some 6" diameter pipe used on Dayton Street. The bridge crossing on Dayton Street utilizes 6" ductile iron pipe. The STEP system uses a 2" with some 3" IPS SDR 26 PVC pipe. The estimated total length of sewer mains and service laterals is 28,850 feet or 5.5 miles.

4.1.1 PUMP STATIONS AND FORCE MAIN

4.1.1.1 Force Main

The majority of the forcemain is 2" IPS SDR 26 PVC pipe (1380 feet). Some 3" PVC pressure main was added from the Fairoaks Pump Station to the manhole located on Prospect Avenue to add capacity. The locations of force main lines can be seen on sheets 2, 4, and 10 in Appendix H. Testing of the subsurface pipe would need to be performed to accurately describe the condition of the force main pipe and its connections.

4.1.1.2 Pump Station

There are two major pump stations utilized in the wastewater system. They are located on Fairoaks Street and on Carey Court. Both pump stations are classified as confined space.

A pump station summary is presented in Table 4-1 below.

Table 4-1: Pump Station Summary

	Fairoaks PS	Carey Ct. PS
Capacity (min. flow GPM)*	21.1	10.6
Pump Type	Hydromatic SKHD 1.5 HP Submersible Effluent Pump	Gould's 0.4 HP Submersible Effluent Pump
Const. Date	1993	1997
Station Type	4'-Diameter Segmental Concrete wetwell (manhole) – 11.25' deep	1000 gallon wetwell (Hank's Tanks septic tank)
Level Control Type	(5) Mercury floats	(4) Mercury floats
PS Control	Pole mounted NEMA 3R electric control panel	Pole mounted Orenco Duplex Control Panel
Alarm Type	Signal Light on pole	Audible alarm
Backup Power	None	None
Force main Type	PVC	PVC
Force Main Length	770'	420'
Force Main Diameter	3"	2"
Force Main Average Velocity (fps)	1.0	1.1
Overflow Provision	None	None
Hydrogen Sulfide Control	None	None

* Minimum flow is based on the flow tests described in Section 4.1.1.2.3

4.1.1.2.1 Fairoaks Pump Station

There are 33 residences (29 septic tanks) connected to a 4" PVC gravity collection line that discharges into the Fairoaks Pump Station. The pump station has a wetwell that is 11.25 feet deep and 4 feet in diameter. According to the as-built drawings, there are two 1 ½ horsepower submersible pumps. The two pumps connect to a 3" PVC pipe that is approximately 770 feet in length and pump to a manhole located on Prospect Street.

Plans to eliminate the Fairoaks Pump Station were made in 2000 by K&D Engineering. The Fairoaks Pump Station bypass was never built due to budgetary reasons.

4.1.1.2.2 Carey Court Pump Station

There are 6 residences connected to the Carey Court Pump Station with laterals ready for two additional connections. The pump station has a 1,000 gallon concrete wetwell. There are duplex pumps connected to a 2" PVC pipe that is approximately 420 feet in length which then connects to a 2" PVC force main with a 2" gate valve on South Main Street. For a list of Carey Court Pump Station deficiencies, see section 4.1.1.2.3.5.

4.1.1.2.3 Pump Drawdown Test

On Thursday March 29, 2012, a pump drawdown test was performed on both pump stations.

Figure 4-1: Pump Station at Carey Court

Figure 4-2: Pump Station at Fairoaks Street

4.1.1.2.3.1 Objectives

The purpose of the test was to measure the flow of each pump and to compare the results to the pump capacities. This data was then used to find an overall efficiency for the pumps.

4.1.1.2.3.2 Weather Conditions

The test was performed on a rainy Thursday morning at approximately 10:30 am. It rained approximately 2" from Sunday (3/25/2012) through Thursday (3/29/2012) and the ground was saturated.

4.1.1.2.3.3 Methodology

The tests were performed by measuring the elevation of the STEP/STEG sewage in the wetwells while both pumps were not running. One pump was then turned on and operated for a designated time (approximately 5 minutes). The pump was then turned off and the STEP/STEG sewage elevation was measured and recorded again. This difference in elevations was used to calculate the volume of STEP/STEG sewage that was pumped. The pumped volume was divided by the time in minutes to determine the pump rate. The process was then repeated with the other pump.

The sewer flow rates into the Fairoaks St. Pump Station were also measured as part of the calculation. The flow rate into the Carey Ct. Pump Station was considered negligible and was not measured.

4.1.1.2.3.4 Test Results

Fairoaks Street Pump Drawdown Test

Table 4-2 below shows the results for the drawdown test at the pump station on Fairoaks Street.

Table 4-2: Fairoaks Pump drawdown results.

Pump	Beginning Elevation (ft)	Ending Elevation (ft)	Difference in Elevation (ft)	Time Elapsed (min)	Avg. unit Volume of Pump Station (gal/in)	Flow (gpm)	Pump Flow with Inflow (gpm)
Sewer Inflow	9.05	8.21	0.84	5.45	7.83	14.5	N/A
Pump 1	8.35	8.70	0.35	5	7.83	6.6	**21.1**
Pump 2	8.41	9.27	0.86	5	7.83	16.2	**30.7**

The results show that Pump 1 was running at 21.1 gallons/minute (gpm) with a sewer inflow of 14.5 gpm accounted for. Pump 2 was running at 30.7 gallons/minute (gpm) with a sewer inflow of 14.5 gpm accounted for. This shows that Pump 2 is running at a higher flow rate than Pump 1.

Carey Court Drawdown Test

Table 4-3 below shows the results for the drawdown test at the pump station on Carey Court.

Table 4-3: Carey Court pump drawdown test results.

Pump	Beginning Elevation (ft)	Ending Elevation (ft)	Difference in Elevation (ft)	Pump Run Time (min)	Avg. unit Volume of Pump Station (gal/in)	Pump Flow (gpm)
Pump 1	7.92	8.07	0.15	5	29.5	**10.6**
Pump 2	8.07	8.23	0.16	5.283	29.5	**10.7**

The results show that both Pumps 1 and 2 are running at approximately the same flow rate.

4.1.1.2.3.5 Conclusions of Results

Fairoaks Pump Station

The pump station at Fairoaks Street showed several areas for concern. There are 33 residences that are connected to the Fairoaks Pump Station. A flow of 14.5 gpm is quite high for the time of day (approximately 10:30 am) the test was performed. This high flow suggests that it may be caused by I\I because these flows are not typical for the number of houses and the time of day the test was performed. It was also noted that I\I was visibly occurring in the pump station wetwell. During testing, a trickle of water was observed leaking into the pump station through a seam in the wetwell (infiltration of ground water through a seam that should be grouted).

Another concern with the Fairoaks Pump Station was that one of the runtime counters was not taking readings. Because the counter was not working, it is impossible to know how long that particular pump was running. It is important to know the pump runtimes to see if the pumps are running excessively. If the pumps are running longer during rainy days, this suggests that I\I is occurring.

Because the flow rate of Pump 1 was only 69% of Pump 2 it suggests that Pump 1 may need to be replaced in the near future. There are no records of new pumps being installed, although there are invoices for pumps and motors. Maintenance records consist of invoices paid for "motor" and "pump". Table 4-4 shows records that were provided by the City.

Table 4-4: Pump Station Maintenance Records and Expenses.

Date	*Description*	*Expense*
07/08	*Pump*	*$3936*
07/08	*Electrical – to provide phase loss protection to prevent burning out pumps when power surges*	*$2652*
08/09	*Motor*	*$442*
08/09	*Pump*	*$2988*
10/11	*Motor*	*$700*
10/11	*Motor*	*$6509*
10/11	*Cable for motor*	*$708*
11/12	*Motor*	*$775*

It is not clear what specific work was included in the invoices. Since there is no specific evidence to suggest otherwise, the 1993 "AS-BUILT" drawings are the best available evidence of components.

The 1993 "AS-BUILT" drawings list Hydromatic SKHD 150 pumps as being in the pump station. Based on the difference in elevation and the friction loss in the pipe, it is estimated that the total dynamic head would be approximately 40 feet. Using the Pump Performance Curve in the OPERATOR'S MANUAL, the expected flow would be in the 50-GPM range. If the assumptions are true, the pumps are performing at about 40% (Pump 1) capacity and 60% (Pump 2) capacity.

Carey Court

The pump station at Carey Court also showed several areas for concern. There are 6 residences connected to the Carey Court Pump Station with the laterals ready for an additional two connections. At the time of the test, storm water (inflow) was visibly occurring in the pump station riser. There was a trickle of water leaking into the pump station at the penetration through the riser for the discharge pipe.

The pumps were running at approximately 10-GPM. According to the AS-BUILT drawings for Carey Court, Gould's EP0411 pumps are installed and the design flow should be in the 26-GPM range, which suggests that the actual performance is less than 40% of the design flow. While one pump was running, the other pump showed turbulence around the pump screen. It was noticed that there are no check valves installed before the two pipes intersect in the "Tee". Without check valves, while one pump is running, only part of the flow is actually discharging from the pump station. The other part of the flow is being pushed back through the non-running pump. Check valves should be installed before the pipes intersect in the "Tee" to assure that the pumps are working at their maximum efficiency.

The overall configuration of the Carey Court Pump Station is not designed for easy maintenance. The current discharge manifold piping would make pump removal and service extremely difficult. The existing

valving is located in the wetwell and is difficult to access. There are electrical junction boxes located in the wetwell which could be a potential safety hazard with regard to combustible gases in the wetwell.

4.1.2 COLLECTION SYSTEM

The collection system is made up of approximately 20,000 linear feet of sewer mains and approximately 8,500 feet of service laterals. The collection system is predominantly 4" PVC with some 6" PVC lines and 2" or 3" PVC pressure lines. Maps of the collection system were created for this report and are included as Appendix H.

As stated before, there are 151 septic tanks connected to the system. Septic tanks installed during phase 1 were fitted with a 24" riser located on the STEP/STEG sewage side of the tank and a 6" PVC inspection port located on the influent side. The tanks vary in size from 1,000 gallon up to 3,000 gallons. All tanks were newly installed during the construction with the exception of 10 existing tanks that were utilized. Septic tanks installed in Phase 2 were fitted with a 24" riser located on the influent side and a 6" PVC inspection port located on the STEP/STEG sewage side. Cleanouts were installed outside of the tank on the influent service lateral on all tanks.

The tanks are currently pumped by a City-contracted third party. The tanks are required to be pumped when sludge and scum volumes exceed 25% of the tanks volume or every five years for residential tanks and every four years for commercial tanks per the current NPDES permit. The O&M Manual suggests that the tanks be visually inspected annually to determine when the tank needs to be pumped using a scum/sludge measurement method. It would be beneficial to change the NPDES permit to require pumping as needed via measurements only, provided measurements are actually performed and recorded. Based on pumper invoice records, some tanks are pumped on a regular basis while others have no record of being pumped. Pumping records are listed in Appendix D. To summarize the records, 90 of 151 tanks (60%) have been pumped within five years. Vacancy was not taken into consideration.

Figure 4-3 shown below is intended to depict how a normal well-functioning septic tank would work. Raw sewage, which consists of solids and liquids, enters from the user's building. Septic tanks are typically sized such that at least two days of detention time is achieved. During the two day period, the solids settle out to the bottom of the tank and a scum layer floats to the surface. Because the tank outlet is turned down (the top of the tee shown on the right in the photo is above water and scum level), relatively clear STEP/STEG sewage is discharged out to the City treatment plant. If routine maintenance is not performed, then solids will be allowed to enter the treatment system. Solids have been an issue at the recirculation tank according to Public Works personnel (see Section 4.2.4).

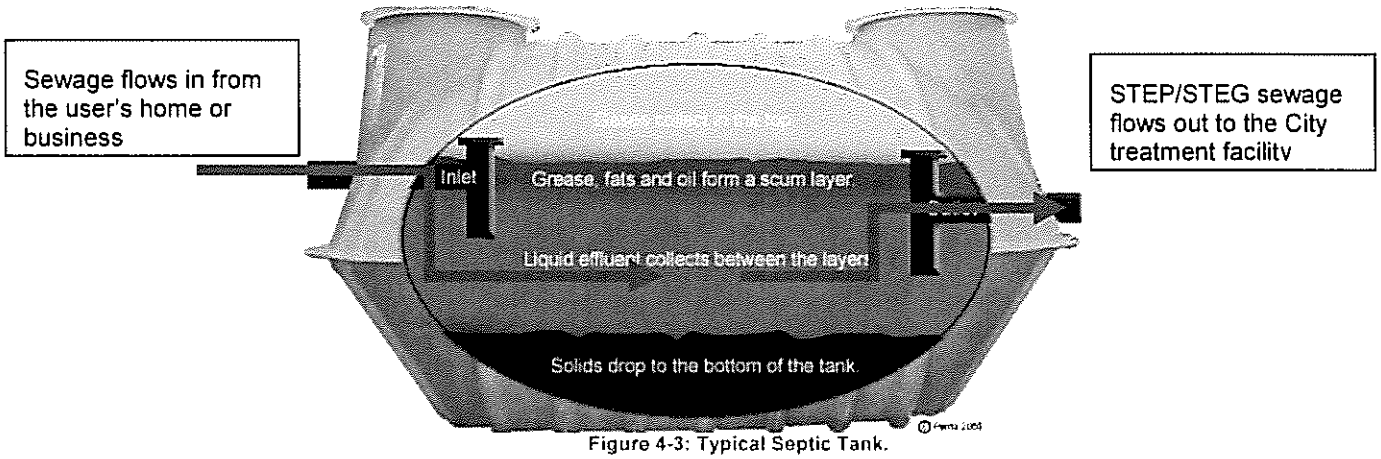


Figure 4-3: Typical Septic Tank.

It was reported by public works that most service laterals extending from the residence/building to the septic tank were newly installed during the construction of the wastewater system (Wallis). Service laterals extending from the residence/building to the septic tanks are property of the residence and are required to be maintained by the property owner.

4.1.3 CONDITION, DEFICIENCIES, AND STATUS OF CONVEYANCE SYSTEM

The majority of the sewer system was constructed during Phase 1 in 1986 and is 26 years old. Phase 2 construction, in 1993, expanded the system to add residents south of the Little Luckiamute, as well as some residents north of the river.

4.1.3.1 Deficiencies Found

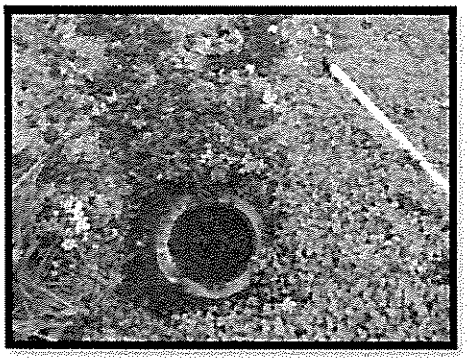
Deficiencies found in the pump stations are listed in section 4.1.1.2.3.5 in the Conclusion and Results section of the pump drawdown test.

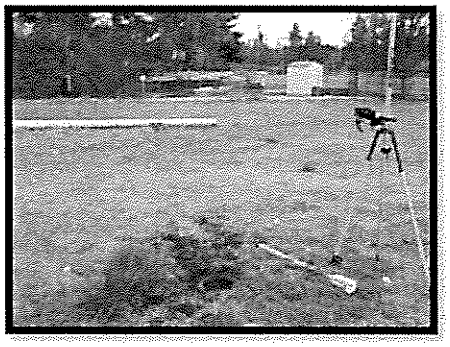
Subsurface deficiencies can only be identified by systematically testing and recording the results, which is necessary to reduce and/or stop the inflow and infiltration (I/I) problems in the system (See Section 5.1.3). Subsurface deficiencies can generally be classified as problems with the STEP/STEG sewage transmission lines, problems with the septic tanks or problems with the sewer line from the user to the tank. Testing of the collection system is necessary to analyze the condition of subsurface connections, mainlines, service laterals and tanks. Public Works has tried smoke testing and TV testing, but did not keep records and reportedly the results were inconclusive. More discussion of testing is included in the I/I section of this report (Section 5.1.3).

Below is a list of visible deficiencies found in the Falls City sewer system while surveying.

- **Missing** STEP/STEG sewage **Cleanout Lid**

  The cleanout located in the parking lot to the north/northeast of the wastewater treatment plant nearest to the wastewater treatment plant was missing its cleanout lid. The cleanout was packed with rock. It is unclear if the cleanout cap was still in place and in good condition.



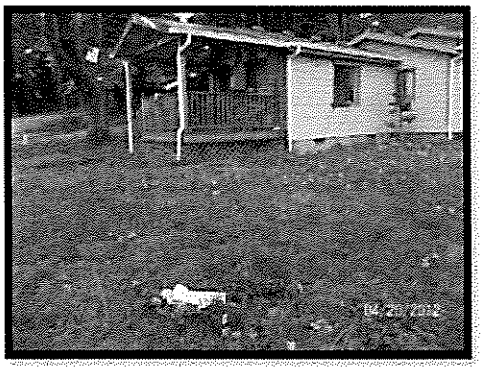


- **Missing Sewer Cleanout Lid**

  The sewer cleanout located at 90 Prospect Street was missing a lid. There appeared to have been an old rag shoved in the pipe, but the rag was almost completely deteriorated.

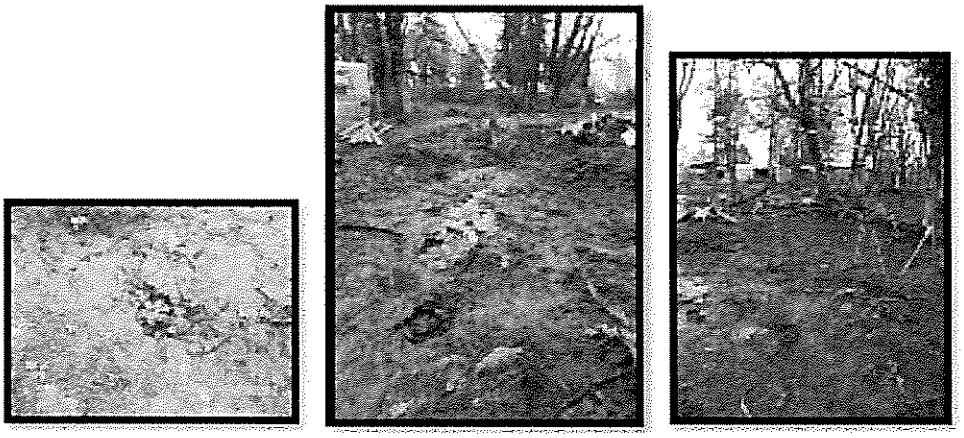
- **Cracked Septic Tank Lid**

  The septic tank riser lid located at 558 Mitchell Street appeared to be almost completely broken into two pieces. There was a small piece of plywood (particle board) placed over the lid. A new riser cover is required to replace the broken lid.



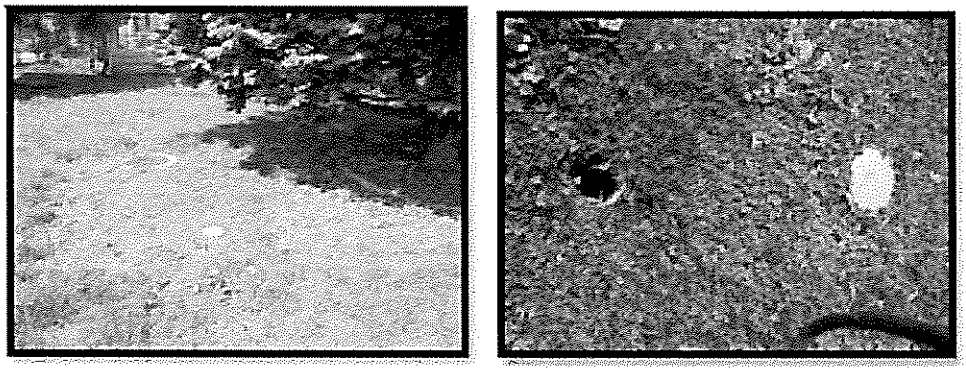
- STEG sewage **Cleanout Lid off of the riser**

  The STEG sewage cleanout that is shown on the as-built drawings, which is supposed to be located on the property of 475 5th Street, could not be found. A lid was found upside down in the mud near the expected cleanout site. There was a ditch draining water in the vicinity of the expected cleanout location. This could be a possible location of I/I if the cleanout is broken or missing its cap.



- STEG sewage **Cleanout Lid missing**

The STEG sewer cleanout located on the property of 171 Dayton Street was missing its lid. There was no evidence of a lid. It is recommended that the City add cleanout lid replacement to their maintenance schedule.



4.2 WASTEWATER TREATMENT PLANT

The existing wastewater treatment plant is located south of Falls City High School.

The plant was constructed during Phase 1 of construction in 1986 with the majority of the sewer system. The UV disinfection system was constructed during Phase 2 in 1993.

Primary sewage treatment is accomplished by septic tanks. Septic tanks allow solids to sink to the bottom of the tank while the grease/scum floats to the top. The STEP/STEG sewage is drained from the relatively clear layer between the solids and the scum. The septic tanks are able to greatly reduce Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD).

The STEP/STEG sewage flows through the collection system and down to the treatment plant were it first passes through a "Stevens" flow monitoring station designed to read flows up to 70 gpm and also keeps a continuous count of total gallons. The sewage then discharges into a 49,000 gallon cast-in-place concrete recirculation tank.

STEP/STEG sewage is pumped by one of three pumps from the recirculation tank to the Recirculating Gravel Filter (RGF). Two pumps are on duty to alternate pumping while the third can be manually switched into service if either of the two primary pumps fails or needs service.

STEP/STEG sewage is distributed onto one of two cells in the RGF (half the total surface area) through a manifold of perforated pipes laid near the surface of the 7,517-square-foot RGF. The sewage is sprayed onto the RGF at approximately a 30 degree angle. The sewage infiltrates through a cover of 1/2" – 3/4" washed gravel then through three feet of uniformly graded pea gravel (media) before draining to the effluent dosing/splitter tank. The RGF media provides surface area for bacteria to stick to while they consume organic material and nutrients.

After trickling down through the gravel, effluent is collected on an impervious poly sheet in the base of the RGF and piped by gravity flow to the dosing tank.

The dosing/splitter tank sends 80% of the treated effluent back into the recirculation tank while sending the other 20% to the drainfield located under the football field or to the UV disinfection unit to be discharged into the Little Luckiamute River (November 1st to April 30th). The dosing tank has a capacity of 9,830 gallons. When working properly, the dosing tank uses two automatic siphons to dose the drainfield with 4,270 gallons per dose.

The City has one primary drainfield located under the High School football field. The drainfield consists of eight cells. Six of the cells measure 80 ft. X 100 ft. and consist of 1,670 linear feet of disposal pipe per cell. Two of the cells are half size and measure 80 ft. X 50 ft. and consist of 835 linear feet of disposal pipe per cell. Drainfields, marked A-3 and B-3 on the RECORD DRAWING JAN, 1988, were reserved for Falls City School District use.

The two valves at the heads of A-3 and B-3 were to remain closed until the school district gave permission to open them. In a 1990 report written by HGE Engineers, these valves were to be opened upon completion of the phase 2 work. The drainfield has a total length of 11,690 feet. The drainfield is permitted to receive 53,200 gallons/day from the dosing tank. This would mean that the drainfield is processing up to 4.55 gallons/linear foot. If cells A-3 and B-3 are closed the drainfield is processing up to 6.37 gallons/linear foot.

Between November 1st and April 30th each year flows in excess of 53,200 gallons/day (permitted drainfield capacity) are sent through the RGF and then treated by a UV light disinfection system (26,250 gallons/day permitted capacity) and discharged into the Little Luckiamute River to the west of the recirculation tank. The maximum permitted total flow during the designated wet-weather period is 79,450 gallons/day. All flow limitations listed are taken directly from the NPDES permit issued by DEQ. A schematic drawing depicting the flow path of sewage in the Falls City Wastewater System can be seen below in Figure 4-4.

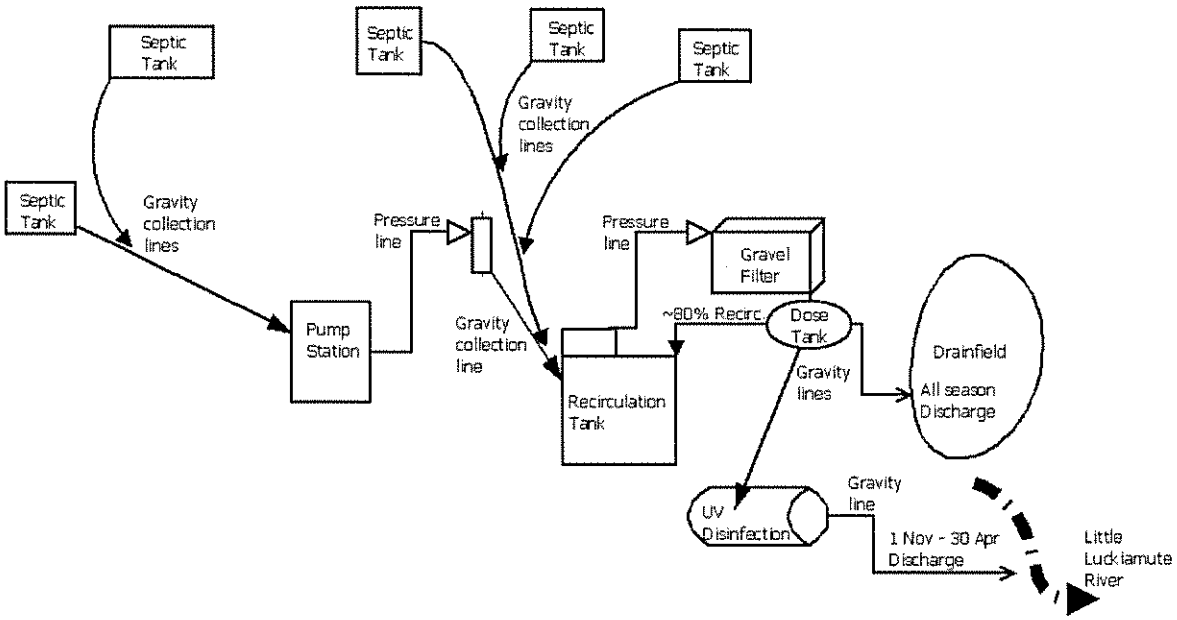


Figure 4-4: Falls City Wastewater System Schematic

Some upgrades have been performed to the treatment plant over the years. In 2007, the City replaced the UV lights, repaired the backup pump motor, modified the electrical system phasing and upgraded the control panel.

There is no evidence that any work has been performed on the Recirculating Gravel Filter (RGF). The RGF distribution piping does not appear to have capabilities to back flush the system. Back flushing the distribution piping is a necessary maintenance practice to assure the pipes are clear of buildup and debris.

4.2.1 Plant Operations

The current permit allows all flows up to 0.0532 million gallons per day (MGD) to be discharged from the RGF to the drainfield (football field). During the winter months, flows up to 26,250 gallons/day flow through the UV light disinfection system and are discharged to the Little Luckiamute River at River Mile 12.0.

4.2.2 Plant Deficiencies

This section covers deficiencies found in the Falls City wastewater treatment facilities. Several deficiencies in the treatment plant have been found during inspections or were reported by Public Works (PW).

Influent Flow Meter

As the STEP/STEG sewage enters the treatment plant it passes through a Stevens Flow Meter (flume type meter). The meter is designed to read flows up to 70 gallons/minute. During the winter months there are several instances when water flows over the weir/flume and exceeds this limit. Since the flow is exceeded only in larger rain events the meter should have enough capacity if I/I were significantly reduced. The meter is equipped with a paper plot data logger which appears to be inoperable. Public Works stated that they have not used the logger for several years. There is no record of the last flow

meter calibration. Lack of calibration could result in inaccurate flow readings which could be detrimental to the entire treatment system. The current NPDES permit requires annual calibration of the flow meter.

Bypass Valve

Between the influent flow meter and the recirculation tank is a 6" 3-way ballcentric bypass valve. This valve bypasses the influent flow directly to the drainfield labeled A1, A2 and A3. PW reported that this valve has been damaged and no longer functions properly. This limits the ability to manage flows for general maintenance, for example, when tank pumping and performing pump calibration.

Recirculation Tank

Public works expressed difficulties in maintaining and cleaning the recirculation tank. Currently, the influent line into the recirculation tank needs to be plugged to keep any additional sewage from entering the tank while maintenance on the tank is being performed. While the line is plugged all the STEP/STEG sewage in the recirculation tank is sent to the RGF and then to the drainfield. This process causes some solids to be spread onto the RGF which can harm the filter operation. This process also overloads the drainfield and reportedly results in sewage surfacing onto the football field. DEQ violations have been attributed to this process according to PW personnel. Reportedly, the solids in the recirculation tank are pumped which takes considerable time (depending on last pump date). This gives PW little time to clean and/or replace the deficient pump.

Recirculation pump connections have been problematic. According to PW, the flange connections are in poor condition. It is believed that the connection to Pump #2 is completely corroded and inoperable. As a result, PW is unable to utilize all three pumps. This puts extra stress on Pump #1 and Pump #3.

The actual pump capacity needs to be measured via a drawdown test so that pumping cycles/times can be adjusted to best manage the effluent flows.

A 5/16" polyethylene screen is located four feet downstream of the recirculating tank inlet pipe. It was reported by PW that the screen is cleaned while the tank is pumped dry. It was also reported that many repairs have been made to the screen over the years. Due to the larger solids that are plugging the distribution piping in the RGF either the screen openings are too large, too much pressure is forcing larger solids through the screen or there are tears in the screen that are causing it to not function as intended. The screen should be inspected and either replaced or another redundant screen installed closer to the pumping end of the tank.

Routine maintenance of septic tanks would also be a benefit in reducing solids in the recirculation tank (see Section 4.1.2 for a tank diagram and operational discussion).

Treatment Control Panel

The treatment plant control panel (controls pumps) is outdated and provides little opportunity to upgrade the pumping system.

Pre-UV Treatment Effluent Meter

Before the effluent enters the UV treatment it passes through a 4" 90-degree propeller type (McCrometer) flow meter. According to PW, this meter clogs and frequently needs to be cleaned and maintained. The reason for clogging is not intuitive, since the effluent passing through has only 20 mg/L solids. One possible solution includes changing the meter to a magnetic type flow meter that has no obstructions protruding into the pipe.

There is no record of meter testing. Schedule B in the NPDES permit required annual (November) calibration.

UV Treatment

The effluent then passes through the UV tubes. PW expressed difficulties in cleaning and maintaining the UV system.

Recirculating Gravel Filter (RGF)

The RGF filter media measures 86.7 feet square giving an area of 7,517 square feet. Using today's industry standard of 5 gallons per square foot (OAR340-70-0302 DEQ On-Site Sewer Rules), the RGF is capable of processing a maximum daily flow of 37,500 gallons. Typically, the RGF is operated at 50 to 70 percent of its maximum daily flow. Daily flows exceeding 70% of its capacity cause stress in the treatment system and challenge performance, maintenance and longevity. This means that the RGF should be processing a maximum of 26,250 gallons/day. Currently, all flows that enter the treatment plant are passed through the RGF meaning that the 70% maximum capacity is being exceeded continually throughout the wet-weather months. In fact, flows are exceeding the overall maximum (100%) capacity of 37,500 gallons/day regularly throughout the wet-weather months if DEQ On-Site Rules were to be used. With regard for Falls City's system, DEQ has made the following determination, "*The criteria found in DEQ's on-site rules are based on typical domestic septic tank effluent and do not take into account high flows due to I/I. The criteria are intended to properly size an RGF in terms of the organic loading. Evaluating an RGF using the on-site criteria is therefore misleading and leads one to believe that organic loading is linear to the hydraulic loading, which it is not the case for a system with significant I/I. In a collection system with little or no I/I, additional connections would result in an increase in organic loading.*"

Since the system is subject to an NPDES permit, not a WPCF permit, On-Site rules do not apply. The hydraulic ceiling as stated in the permit has been determined by the DEQ to be inappropriate for surface water discharge. Upon renewal of the expired NPDES permit DEQ's intention is to remove flow criteria.

An inspection was performed on May 9, 2012 in which several concerns regarding the RGF were discovered. The distribution piping is meant to spread the STEP/STEG sewage relatively evenly over the entire RGF. It was evident that the distribution pipe was only spreading the STEP/STEG sewage over certain areas of the RGF. PW stated that the distribution pipe is easily clogged with solids that find their way through the system. Due to distribution pipe construction, it is very difficult to clean, de-clog and maintain the distribution piping. It seems that there were several clogs throughout the distribution piping causing the uneven distribution of STEP/STEG sewage. Clogs include solids like cigarette butts and feminine hygiene products, according to PW. The uneven distribution has caused ponding and scum buildup on top of the filter in certain areas.

Test holes were dug on May 15, 2012 and found that the RGF was stressed but in satisfactory condition. There was heavy biological matter found in the filter media (Figure 4-5). It was determined that scum/algae buildup was a product of the lack of rock cover over distribution piping. Scum buildup is typically occurring where the distribution piping is protruding from the gravel. Test holes excavated below the surface scum/algae buildup showed there was no evidence of the scum harming filter media.

Figure 4-5 - RGF test hole and close up of gravel media (Photo Taken on May 15, 2012).

During the May 15th inspection, PW was in the process of removing the grassy vegetation that had grown on top of the RGF and was spreading the gravel more evenly over the filter.

Splitter/Dosing Tank

Inspection performed on the splitter/dosing tank showed some deficiencies. The splitter tank does not appear to be splitting the flow consistently at a 4/1 ratio. When the system is on its pumping phase the splitter tanks influent flows increase and it seems that a ratio greater than 4/1 is going back into the recirculation tank. This is more of a concern when flows are higher during the wet-weather period. Flows returning to the recirculation tank in excess of the 4/1 ratio will add extra stress to the treatment system and will also cause maintenance problems. No measurements were made of the flow.

There is no longer an ability to adjust the splitting ratio due to restrictions caused by the design of the system and deterioration and corrosion of the splitter weir. It is important to be able to adjust the splitting ratio for different flow rates.

During the May 2012 inspections it was noted that the dosing tank siphons appeared to have lost their prime or there is a restriction in the drainfield causing a slow trickle of effluent. During the response to surface water on the drainfield in August 2012, it was discovered that the "A-cells" dosing siphon cycled correctly. In September 2012, the dosing tank was pumped (See the record of events in Appendix F) and the siphon for the "B cells" was reactivated. Later in September, the dosing siphon to the "B cells" was repaired.

The "trickle-mode" in which the system was operating for an undetermined amount of time is certainly not the operation mode that was originally designed. There is no way to verify the effects of this mode of operation because there are no inspection ports in the drainfield. The concern is that lack of pressure and volume will not allow the drainfield cells to be dosed evenly. Lack of even dosing will result in some cells being overworked (over saturated).

The siphons were evaluated during the September 2012 surface water incident and, after being recharged with air, determined to have successfully cycled at least one time. After the incident, PW performs dosing siphon observation to their regular maintenance routine.

Drainfield

The drainfield is over worked. There has been little to no time to rest the drainfield since its installation in 1986. If I/I can be significantly reduced, the UV treatment can treat nearly all of the effluent during the wet-weather period while resting the drainfield during the winter months.

The maximum permitted capacity of the drainfield is reported to be 53,200 gallons per day; equal to 4.5 gallons (if all cells are open) of effluent per linear foot, a linear foot provides 4 square feet of absorption area. The loading capacity does not fit conventional on-site wastewater criteria for sizing and gallons; further investigation of the soils and sizing criteria is warranted. The only way to determine the condition of the drainfield is to install inspection ports.

5 WASTEWATER FLOWS

5.1 WASTEWATER VOLUME

5.1.1 DRY-WEATHER FLOW

Dry-weather flows are defined by the DEQ NPDES permit as the period between May 1st and October 31st. During this period, no discharging is permitted into the Little Luckiamute River.

The average dry-weather flow in 2011 for the Falls City treatment plant was 23,000 gallons/day. All treated effluent was directed to the drainfield. In 2011, the maximum and minimum dry-weather flows were 39,000 gallons/day and 18,000 gallons/day respectively.

5.1.2 WET-WEATHER FLOW

Wet-weather flow is defined as the period between November 1st and April 30th. During this period, discharging is permitted into the Little Luckiamute River per the NPDES permit. Discharge into the Little Luckiamute cannot exceed 26,250 gallons/day.

The average wet-weather flow in 2011 for the Falls City treatment plant was 41,000 gallons/day. In 2011, the maximum and minimum wet-weather flows were 74,000 gallons/day and 20,000 gallons/day respectively. Effluent flows up to 26,250 gallons/day are discharged into the Little Luckiamute River while excessive flows are diverted to the drainfield.

Data presented in this section was obtained from Public Works. PW logs the data from the flow meter that has not been calibrated by a certified service provider in several years, so the accuracy of measurements is debatable. The current NPDES permit requires calibration of the flow meter every year.

5.1.3 INFILTRATION AND INFLOW

According to the engineers who designed the collection system, substantial amounts of I/I was discovered immediately following the construction of the system. There were no formal quality control measures taken by the City for the construction of the system due to budget limitations resulting in an inferior wastewater system (Wallis WWFP). The RGF was sized and designed assuming that no I/I would occur throughout the system (1985 HGE O&M Manual).

Several efforts have been made by the City to find and repair I/I problems. The collection system has been smoked tested as well as TV inspected. The smoke testing provided little results due to the fact that the connections to the septic tanks and cleanouts were not properly plugged. PW described smoke pouring out of septic tanks and cleanouts. PW has reported that the whole collection system has been TV tested. The TV testing was performed during the dry-weather and no evidence of pipe separation or protrusions into the pipe were found; however, some low spots were discovered. No visible leaks were seen because the groundwater table was more than likely below the collection system at the time of the inspections. PW attempted to Re-TV the system during the wet-weather period; however, large flows provided no visibility for the inspection. Wet-weather inspection attempts were abandoned.

Comparing the wet-weather and dry-weather flows shows a significant increase in flows suggesting a substantial amount of inflow and infiltration (I/I) is occurring. A summary of the 2011 flows can be seen in Table 5-1. The difference in average dry-weather and wet-weather flows is 18,000 gallons/day. It is important to note that the peak wet-weather flow of 74,000 gallons occurred in a period when Falls City received 8.26 inches of rain the three days prior. This suggests that the ground was heavily saturated and substantial amounts of I/I were occurring.

Table 5-1 - Summary of 2011 Wastewater Treatment Plant Flows

Summary of 2011 Flows	Dry-Weather Flows (May 1st to October 31st)	Wet-Weather Flows (November 1st to April 30th)
Average Flow (gallons/day)	23,000	41,000
Average Daily Precipitation (inches/day)	0.05	0.39
Peak Flow (gallons/day)	39,000 (0.00 inches of rainfall in the three days prior to peak flow)	74,000 (8.26 inches of rainfall in the three days prior to peak flow)
Low Flow (gallons/day)	19,000 (multiple occurrences) (0.63 inches of rainfall in the three days prior to low flow)	18,000 (0.34 inches of rainfall in the three days prior to low flow)

Figure 5-1 below graphically compares the treatment plant flow and the daily rainfall. It is evident that when a rainfall event occurs it is shortly followed by a spike in wastewater flow. I/I is causing significant problems to the treatment processes, including:

- Premature failure of pumps.
- Over working the RGF and drainfield.
- Exceeding of permitted discharge volumes and quality limits.
- Extra maintenance cost and possibly leading to the ultimate failure of the system.

There are many possible causes of I/I throughout the system. The following components are prioritized to be the sources of infiltration in a descending order.

I. The known leakages occurring at Fairoaks and Carey Ct. pump stations and connections in the collection and transfer components where flexible couplings (Fernco couplings) have been used.
II. The STEG and STEP tanks, including their incoming and outgoing pipe lines. Common construction practice uses flexible couplings (Fernco couplings) between gravity rigid pipe connections. Settling soil and deterioration can cause leaks at these connections.
III. The STEP/STEG sewage collection system connections, including: manholes, cleanouts and pipe transitions.
IV. The STEP/STEG sewage collection system mainlines and service laterals.
V. The users in which their plumbing is malfunctioning and/or leaking, including any possible storm/rain/surface water connections. Inspection of these components and repairs should be made on a regular basis.

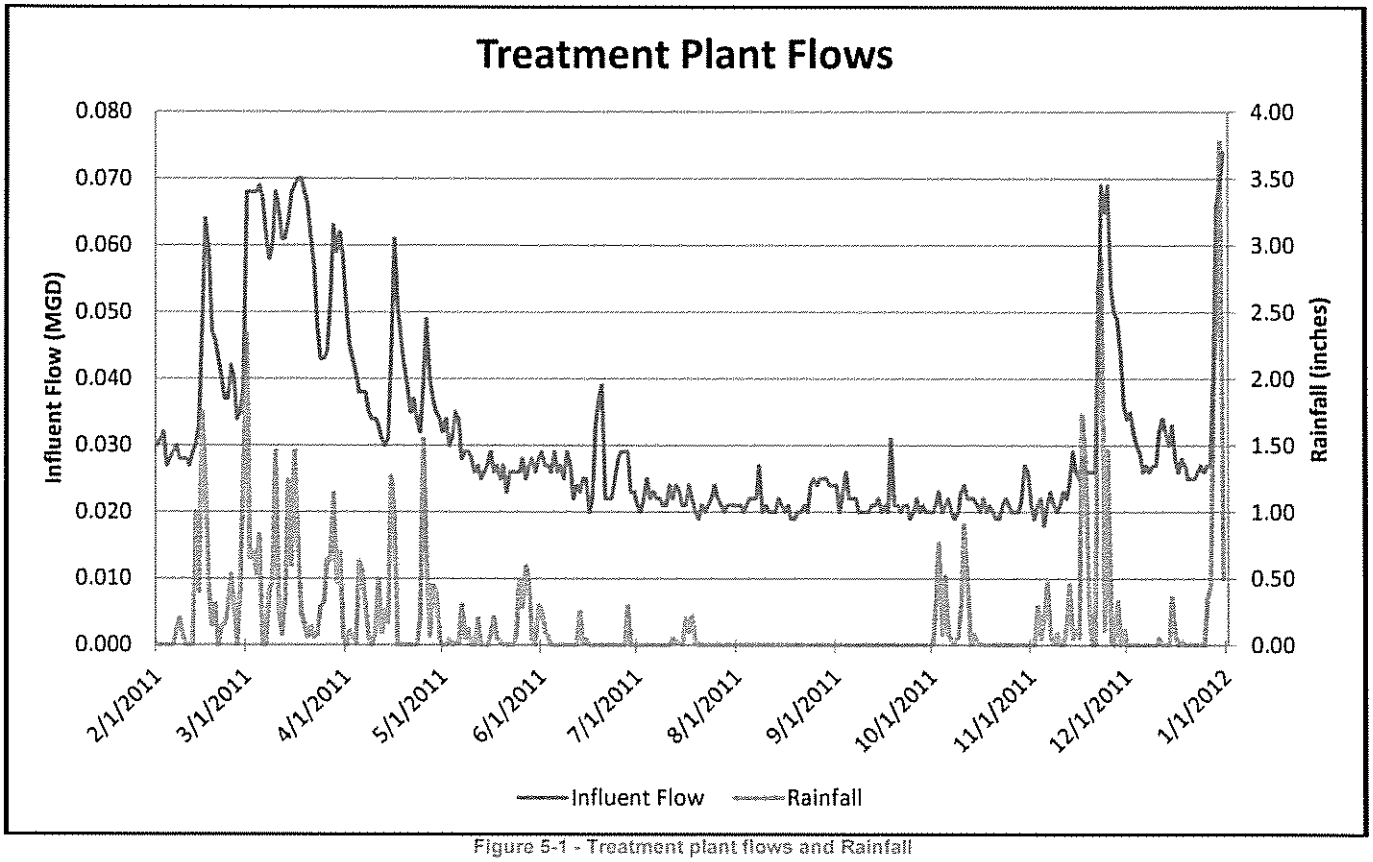


Figure 5-1 - Treatment plant flows and Rainfall

Figure 5-2 graphically shows the power used by both pump stations and the monthly precipitation during the respective time period. It is evident that the Fairoaks Pump Station shows significant amounts of I/I occurring. As rainfall occurs there is a direct correlation to the amount of power consumed by the pump station.

The pump station at Carey Court seems to have little I/I occurring throughout the three year period; however, the last six months show a slight increase in power usage.

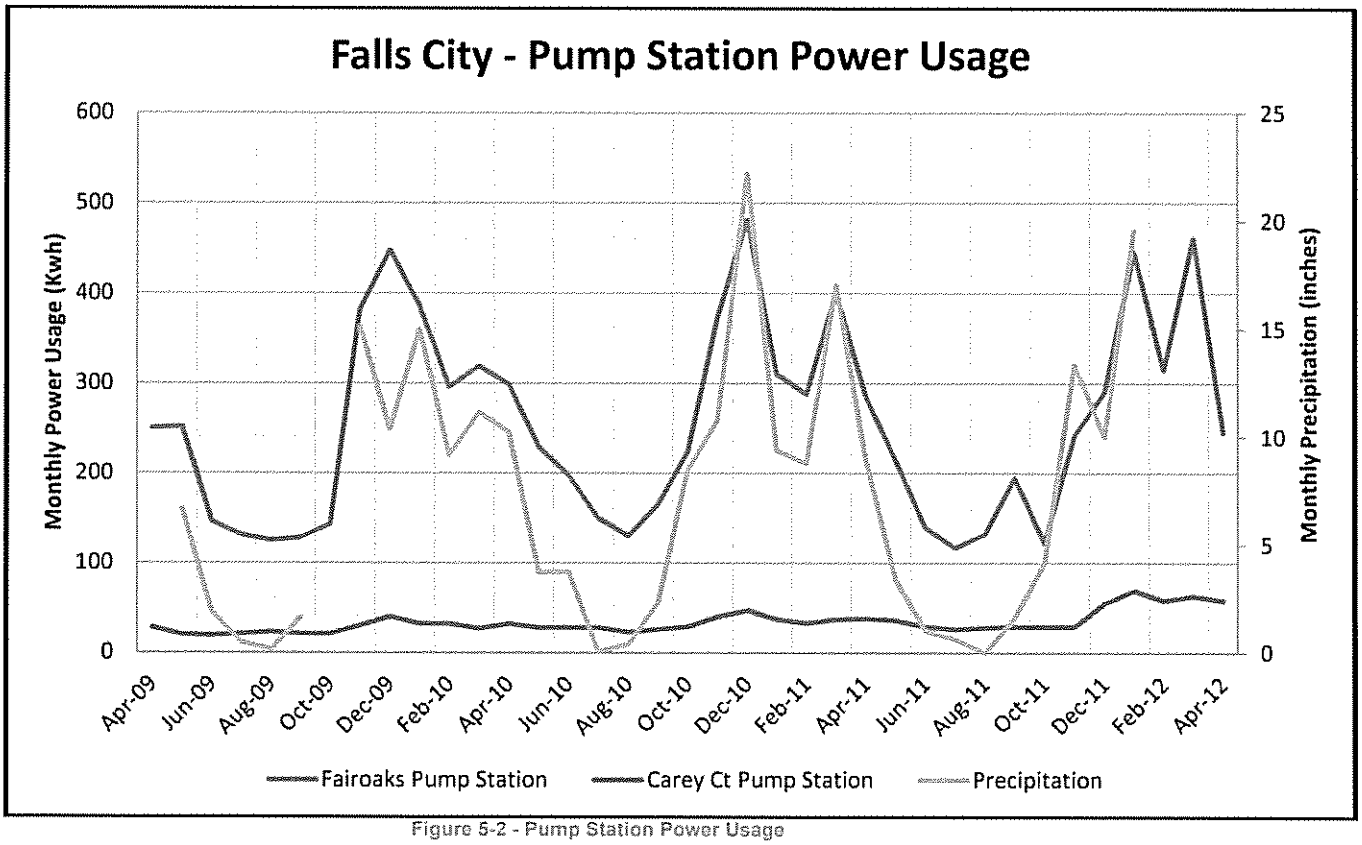


Figure 5-2 - Pump Station Power Usage

5.1.4 Summary of Existing Flows

Flows in the dry-weather period are within the allowable limit that the existing treatment plant can process. Flows during the wet-weather period exceed the amount that the treatment plant can effectively process for an extended period of time. Excessive I/I is causing the wastewater system additional stress that is likely to result in larger maintenance costs and may lead to permit limit exceedance and possible overall failure of the system.

5.1.5 Projected Wastewater Flows/Characteristics

As stated in section 3.3.3, an additional 55 new connections are projected to be added to the wastewater system over the next 20 years. There is no projected addition of industrial or commercial users. Section 6.1.1 shows that for the purposes of this study, 1 EDU is assumed to equal 200 gallons/day (GPD) although on peak I/I days the EDU flows are closer to 413 GPD. The existing RGF system is a closed-system with very little surcharge capacity. Without the addition of surcharge capacity, the system must be capable of treating peak flows. Historically, the construction quality of collection system components has been low, which has resulted in significant I/I. To be conservative, this report assumes that peak flows at 20-year-build-out will be proportional to existing peak flows. As a result, $Peak_{20}$ flows are projected to be 100,000 GPD {74,000 GPD x [1+ (55/179)]}. As stated in section 4.2.4.2, the existing RGF has a maximum design capacity of 37,500 GPD.

5.2 WASTEWATER COMPOSITION

5.2.1 ANALYSIS OF PLANT RECORDS

Plant Daily Monitoring Reports (DMR) for 2011 were analyzed to determine the treatment plant's performance. Treatment provided by the individual septic tanks are not tested therefore no data is available for analysis.

Typically, the treatment plant performs within the DEQ permitted limits. Occasionally, BOD and TSS levels will exceed the daily, weekly and/or monthly permitted limits. Since the 2002 Wallis Facilities Plan, six DEQ violations have been issued to Falls City for exceeding the BOD and/or TSS limits.

The effluent BOD_5 and TSS concentrations and the NPDES weekly and monthly permit limits for 2011 can be seen in Figure 5-3 below. As seen in Figure 5-3, there were two instances in 2011 where the weekly and monthly TSS concentrations were exceeded. There was only one instance when the weekly BOD concentration was exceeded. No records of official DEQ violations were issued for exceeding these limits.

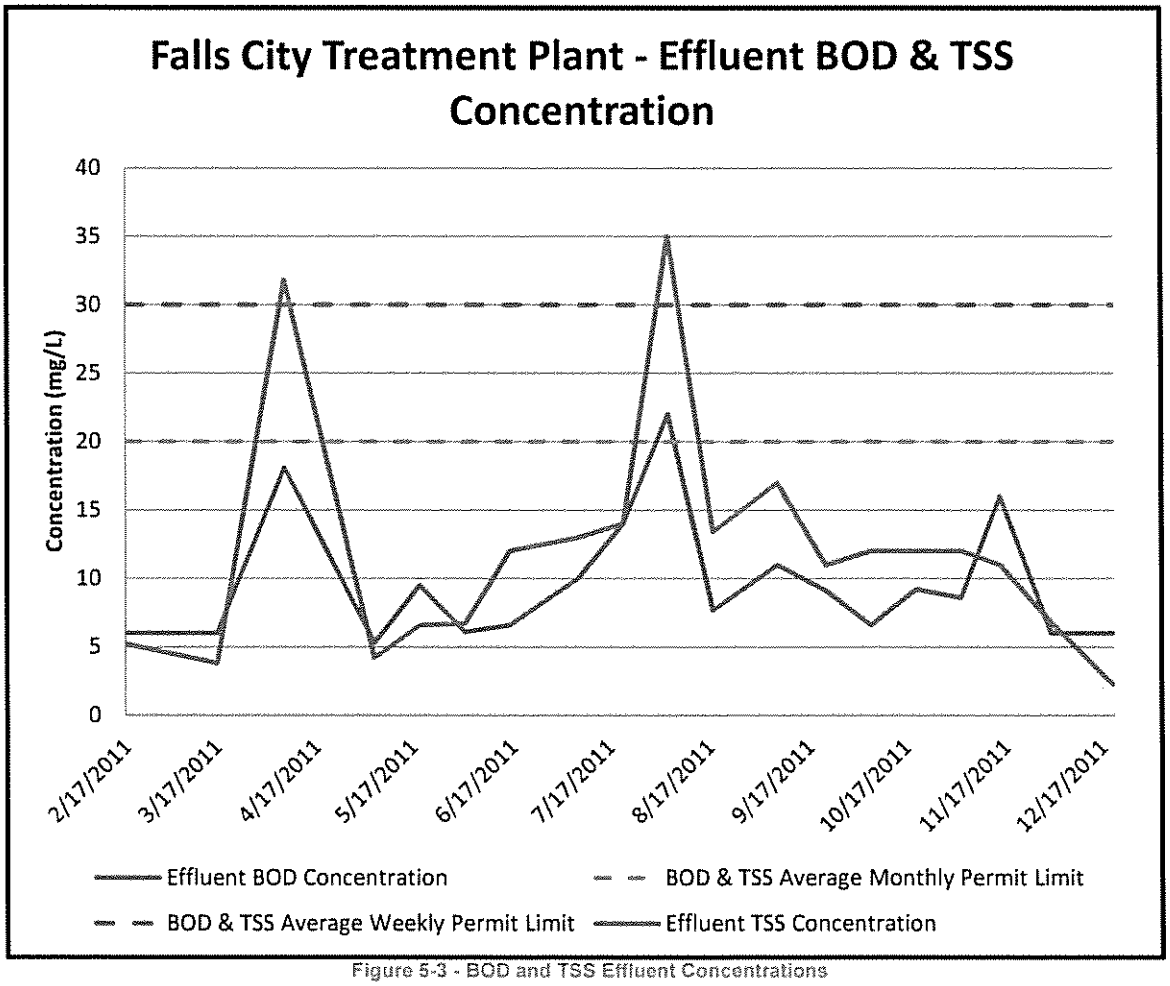


Figure 5-3 - BOD and TSS Effluent Concentrations

The effluent BOD_5 and TSS mass loading and the NPDES daily, weekly and monthly permit limits for 2011 can be seen in Figure 5-4 below. There was one instance where the daily, weekly and monthly TSS mass loading permit limit was exceeded and another instance where the daily limit was exceeded. The daily permit limit for BOD mass loading was exceeded once. No records of official DEQ violations were issued for exceeding these limits.

The permitted limit was exceeded once in the wet-weather period and once in the dry-weather period. There is no clear relationship between precipitation levels and high BOD/TSS levels.

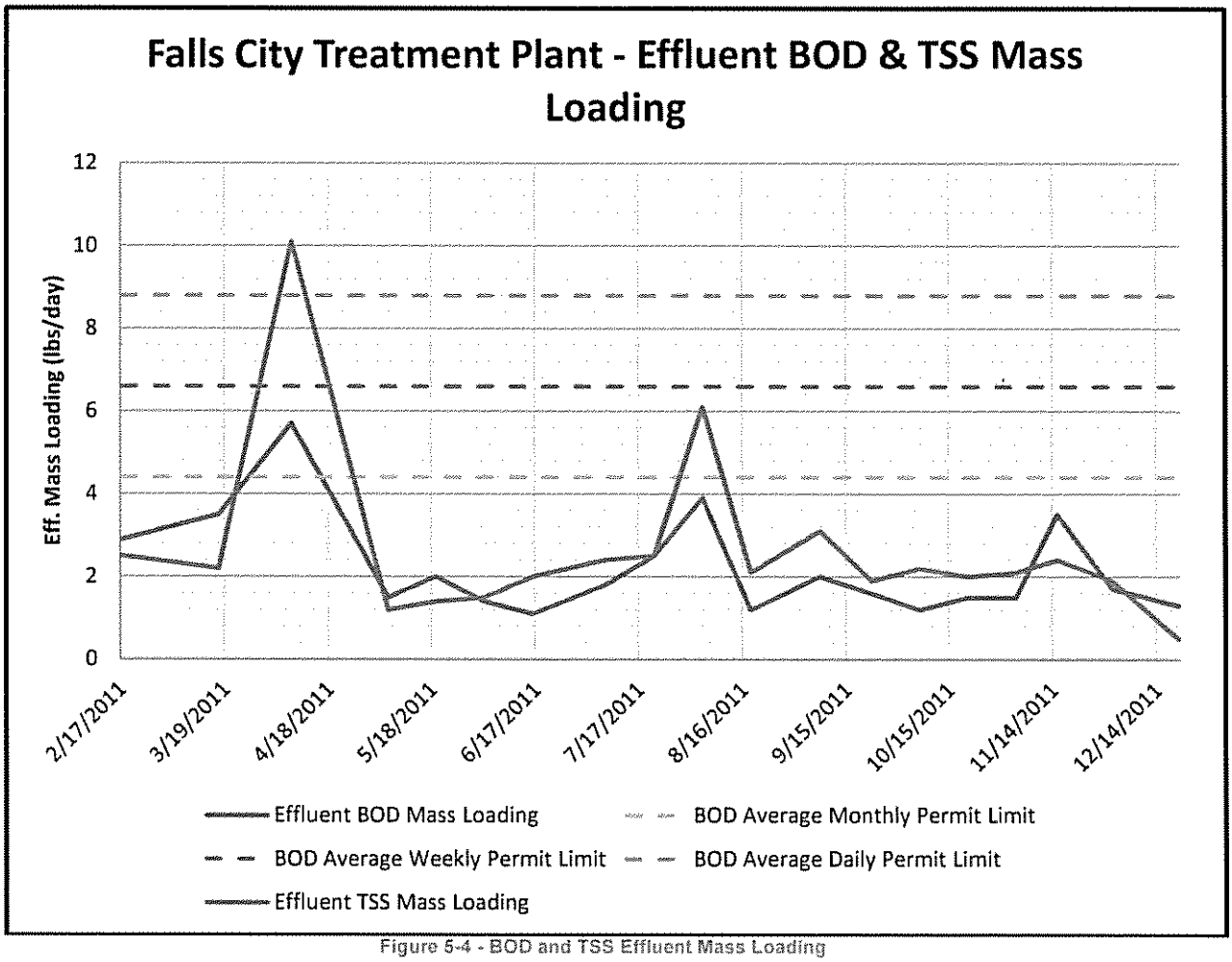


Figure 5-4 - BOD and TSS Effluent Mass Loading

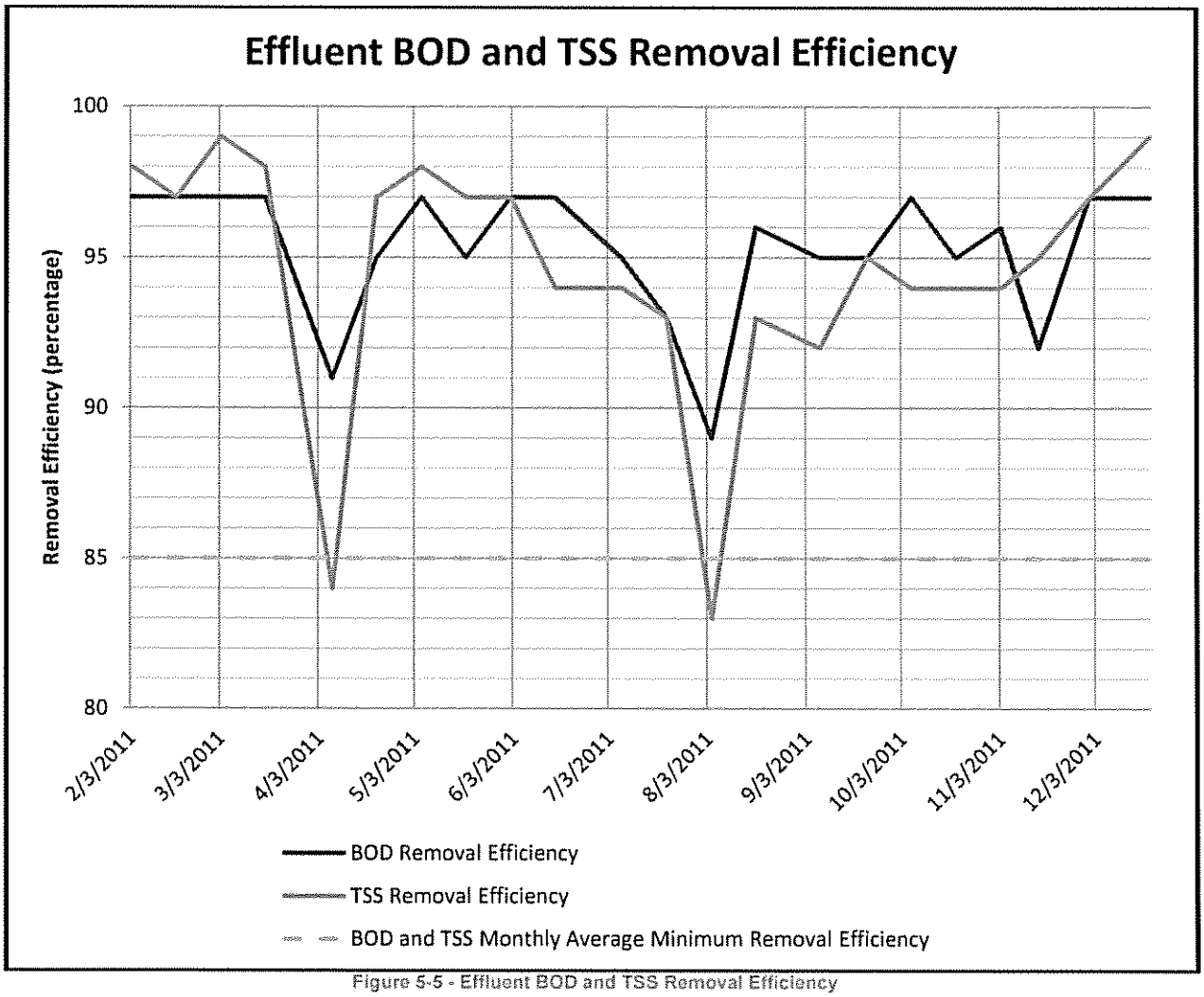


Figure 5-5 - Effluent BOD and TSS Removal Efficiency

5.2.2 WASTEWATER COMPOSITION

No raw wastewater test records were available for this report. "Typical data on the composition of untreated domestic waste found in wastewater collection systems are reported in Table 5-2. The data presented in Table 5-2 are based on an average flow of 120 gal/capita-day and include constituents added by commercial, institutional, and industrial sources. As shown in Table 5-2, there is a significant range in the values reported for the individual constituents. Recognizing that there is no such thing as typical wastewater, it must be emphasized that the typical data presented in Table 5-2 *should be used only as a guide."*(**Small and Decentralized Wastewater Management Systems, Crites & Tchobanoglous, McGraw Hill 1998**)

Table 5-2: Typical composition of untreated domestic wastewater*

Contaminants	Concentration		
	Unit	Range	Typical†
Solids, total (TS)	mg/L	350-1200	700
Dissolved solids, total (TDS)	mg/L	280-850	500
Fixed	mg/L	145-525	300
Volatile	mg/L	105-325	200
Suspended solids, total (TSS)	mg/L	100-350	210
Fixed	mg/L	20-75	55
Volatile	mg/L	80-275	160
Settleable solids	mL/L	5-20	10
Biochemical oxygen demand, 5-d, 20°C (BOD_5, 20°C)	mg/L	110-400	210
Total organic carbon (TOC)	mg/L	80-290	160
Chemical oxygen demand (COD)	mg/L	250-1000	500
Nitrogen (total as N)	mg/L	20-85	35
Organic	mg/L	8-35	13
Free ammonia	mg/L	12-50	22
Phosphorus (total as P)	mg/L	4-15	7
Organic	mg/L	1-5	2
Inorganic	mg/L	3-10	5
Chlorides‡	mg/L	30-100	50
Sulfate‡	mg/L	20-50	30
Oil and grease	mg/L	50-150	90
Volatile organic compounds (VOCs)	mg/L	<100 to >400	100-400
Total coliform	no./100 mL	10^6-10^9	10^7-10^8
Fecal coliform	no./100 mL	10^3-10^7	10^4-10^5
Cryptosporidium oocysts	no./100 mL	10^{-1}-10^2	10^{-1}-10^1
Giardia lamblia cysts	no./100 mL	10^{-1}-10^3	10^{-1}-10^2

*Adapted from Tchobanoglous and Burton (1991).
† Based on a flow of 120 gal/capita-day. Additional data on the number of microorganisms preset in septic tank STEP/STEG sewage and untreated wastewater may be found in Table 2.21 in Chap. 2, Small and Decentralized Wastewater Management Systems.
‡ Values should be increased by amount present in domestic water supply.

6 BASIS OF PLANNING

6.1 BASIS FOR DESIGN

A 20 year planning period was used for the basis of planning for the Falls City Wastewater Facilities Plan.

6.1.1 EQUIVALENT DWELLING UNIT PROJECTIONS

An equivalent dwelling unit (EDU) is a means of standardizing the volume and the strength of the waste per connection. For example, a connection that uses four times the volume or strength of a typical EDU would be assigned four EDU's.

For the purpose of this study we are assuming that 200 gallons/day is equal to one EDU. Two hundred gallons per day per EDU was computed by multiplying the household density (2.59) given in section 3.3.3 by an average flow per person of 70 gallons per day (Crites-Tchobanoglous). It was assumed that strengths are relatively similar for all connections because there was no STEP/STEG sewage test data available to analyze. As noted earlier, EDUs should not be a factor in computing peak design flows.

Non-residential use conversion to EDU was accomplished by reviewing domestic water use during winter months. It is assumed that a large portion of winter water use is discharged into the sewer system. Summer use is not used because activities like irrigation, car washing, and pressure washing may be occurring. Appendix G contains the complete data used for the evaluation.

Table 6-1 – Equivalent Dwelling Unit Breakdown

Connection Type	Number of Connections	Present Number of EDU's
Single Family Residence	162	162
Multi Family Residence	1	6
Commercial	7	8 † **
Institutional	4	4 † **
Schools	2	5
Churches	3	3 †
Total	**179 Connections ***	**188 EDU's**

* A few connections are currently inactive but are still connected to the system and therefore will be considered.
** 1 EDU Minimum.
† Water use data was not available for all connections therefore minimum number of EDU's was assigned.

Over the next twenty year planning period it is estimated that an additional 55 connections will be added to the wastewater system. The 55 connections are assumed to be single family residence and are assigned 1 EDU per connection; therefore, 243 total EDU's are projected by the year 2032.

6.1.2 REGULATORY REQUIREMENTS

Regulatory requirements for the wastewater system are established by federal and state laws. The Federal Water Pollution Act of 1948 was the first major U.S. law to address water pollution. The act was significantly amended and became the Clean Water Act (CWA) in 1972. Several other amendments have been made to the CWA over the years. The CWA established structure to regulate pollutants that are discharged into United States water. The National Pollutant Discharge Elimination System (NPDES) program was enacted as part of the CWA to regulate the discharge of pollutants from a point source. The NPDES permit regulates discharge limits not to be exceeded: minimum monitoring and reporting requirements, compliance conditions/schedules and general and site specific special conditions.

In Oregon, DEQ is EPA's designated agency to administer the NPDES and WPCF permits program. Phase 1 of the system was regulated by DEQ under a Water Pollution Control Facility (WPCF) permit because 100% of the STEP/STEG sewage was discharged into the subsurface absorption area (drainfield). Phase 2 included discharging treated STEP/STEG sewage directly to surface water (the Little Luckiamute River) which effected a permitting change from WPCF to NPDES permit.

6.1.3 EFFLUENT QUALITY

Effluent quality limits have been set by the NPDES Permit. Falls City treatment plant currently discharges treated effluent under an expired NPDES permit (#101808). A permit renewal application has been filed. The expired NPDES permitted has been administratively extended limits of the expired permit can be seen in Table 6-2 below.

Table 6-2 - NPDES Permitted Limits

	NPDES Permitted Limits Little Luckiamute River (Outfall 001)	**NPDES Permitted Limits Drainfield (Outfall 002)**
Allowable Discharge Period	November 1 – April 30	Year-round
Maximum Discharge Flow	26,250 gallons/day	53,200 gallons/day
Effluent BOD_5, mg/L		
Monthly Average	20	NA
Weekly Average	30	NA
Effluent BOD_5, lbs/day		
Monthly Average	4.4	NA
Weekly Average	6.6	NA
Daily Average	8.8	NA
Effluent TSS, mg/L		
Monthly Average	20	NA
Weekly Average	30	NA
Effluent TSS, lbs/day		
Monthly Average	4.4	NA
Weekly Average	6.6	NA
Daily Average	8.8	NA
BOD_5 Removal Efficiency	85%	N/A
TSS Removal Efficiency	85%	N/A
***E. Coli* Bacteria**		
Monthly Geometric Mean, organisms per 100 mL	126	N/A
Single Sample, organisms per 100 mL	406	N/A
pH	6.0 – 9.0	N/A

6.1.4 TREATMENT EFFECTIVENESS

Treatment effectiveness is measured by effluent BOD/TSS concentrations, mass loading and removal efficiency. For the basis of design, it is assumed that NPDES permitted limits will remain the same unless a new treatment process is adopted. According to discussions with DEQ, if a new treatment process (i.e. lagoon) is selected as the alternative, then a new NPDES permit will be issued with appropriately updated discharge concentrations and rates.

6.1.5 PLANT RELIABILITY CRITERIA

The plant must be reliable in day-to-day operations for a design period of 20 years, provided routine maintenance and repairs are conducted as soon as they are discovered.

The US-EPA Reliability and Redundancy Criteria for Sewerage Works are included below:

100. WORKS DESIGN CRITERIA

110. WORKS LOCATION

The potential for damage or interruption of operation due to flooding shall be considered when siting the treatment works. The treatment works structures and electrical and mechanical equipment shall be protected from physical damage by the maximum expected one hundred (100) year flood. The treatment works shall remain fully operational during the twenty-five (25) year flood, if practicable; lesser flood levels may be permitted dependent on local situations, but in no case shall less than a ten (10) year flood be used. Works located in coastal areas subject to flooding by wave action shall be similarly protected from the maximum expected twenty-five (25) and one hundred (100) year wave actions.

Existing works being expanded, modified, upgraded or rehabilitated shall comply with these criteria to the degree practicable.

The flood and wave action elevations used to implement these criteria shall be determined and justified by the Grant Applicant, using available data sources where appropriate. Elevations for a specific location may be available from local or state studies as well as studies by the following Federal organizations: U.S. Army Corps of Engineers, U.S. Geological Survey, U.S. Soil Conservation Service, National Oceanic and Atmospheric Administration, and Tennessee Valley Authority.

The works shall be accessible in all normal seasonal conditions, including the expected annual floods.

120. PROVISIONS FOR WORKS EXPANSION AND/OR UPGRADING

All new works and expansions to existing works shall be designed for further expansion except where circumstances preclude the probability of expansion. During a works' upgrading or expansion the interruption of normal operation shall be minimized and shall be subject to the approval of the Regional Administrator.

130. PIPING REQUIREMENTS

131. Pipes Subject to Clogging

131.1 Provisions for Flushing of Pipes

The works shall have provisions for flushing with water and/or air all scum lines, sludge lines, lime feed and lime sludge lines, and all other lines which are subject to clogging. The design shall be such that flushing can be accomplished without causing violation of effluent limitations or without cross -connections to the potable water system.

131.2 Provisions for Mechanical Cleaning of Pipes

All piping subject to accumulation of solids over a long period of time shall have sufficient connections and shall be arranged in a manner to facilitate mechanical cleaning. This may include the main wastewater treatment process piping, service water system piping, and sludge process piping. Special attention shall be paid to piping containing material which has a tendency to plug, such as scum lines, drain lines, and lime sludge lines. System design shall be such that the mechanical cleaning can be accomplished without violation of effluent limitations.132.

Provisions for Draining Pipes

Where practicable, all piping shall be sloped and/ or have drains (drain plug or valve) at the low points to permit complete draining. Piping shall be installed with no isolated pockets which cannot be drained.

133. Maintenance and Repair of Feed Lines

Lines feeding chemicals or process air to basins, wetwells, and tanks shall be designed to enable repair or replacement without drainage of the basins, wetwells or tanks.

140. COMPONENT MAINTENANCE AND REPAIR REQUIREMENTS

141. Component Repair

Every vital mechanical component (mechanical components include such items as pumps, bar screens, instrumentation and valves, but not piping, tanks, basins, channels, or wells) in the works shall be designed to enable repair or replacement without violating the effluent limitations or causing a controlled diversion. To comply with this requirement, it is permissible to use the collection system storage capacity or holding basins and to perform maintenance during the low influent flow periods. This requirement applies to shutoff and isolation valves. Provisions shall be made in the initial works design to permit repair and replacement of these types of valves.

Example: This criterion applies to the isolation valves of main wastewater pumps. The following are examples of ways these valves could be maintained. Pump suction isolation valves can be maintained if the works has a two compartment main pump wetwell and if the works can continue operation (during the diurnal low flow period, for example) with one part of the wetwell isolated. Pump discharge isolation valves connected to a pressurized outlet header can be maintained if the collection system storage capacity is sufficiently large to permit all main wastewater pumps to be stopped (collection system storage capacity is used) while the valve in question is removed and blind flanges installed.

142. Component Access Space

Adequate access and removal space shall be provided around all components to permit easy maintenance and/or removal and replacement without interfering with the operation of other equipment. Components located inside buildings or other structures shall be removable without affecting the structural integrity of the building or creating a safety hazard. Normal disassembly of the component is permissible for removal and replacement. This criterion is not intended to be applicable to the removal or replacement of large tanks, basins, channels, or wells.

Note: This criterion requires that consideration be given to the sizing of doors, stairways, hallways, hatches, elevators and other access ways in the initial works design. It also requires that special thought be given to the physical layout of piping systems and components in the initial design, especially to components located above and below the ground level of buildings and to unusually large components. The complete path of removal fron1 in- plant location, through hatches, doors and passageways, to a truck or other service vehicle should be checked and defined for each component.

143. Component Handling

The works shall have lifting and handling equipment available to aid in the maintenance and replacement of all components. In addition, the placement of structures and other devices, such as pad-eyes and hooks, to aid component handling shall be considered in the initial design. This is particularly important for large and/or heavy components which require special handling and lifting equipment. Means shall be provided for removal of components located above and below the ground level of buildings and other structures. This criterion is not intended to be applicable to the removal or replacement of large tanks, basins, channels, or wells.

144. Essential Services

Essential services, such as water, compressed air, and electricity, shall be made available throughout the works where required for cleaning, maintenance, and repair work. To facilitate cleaning wetwells, tanks, basins and beds, water (supplied from a non-potable water system or the works' effluent) shall be supplied at these points by means {If a pressurized water system with hydrants or hose bibs having minimum outlet diameters of one inch.

150. Isolation of Hazardous Equipment

Equipment whose failure could be hazardous to personnel or to other equipment shall have means for isolation, such as shutoff valves, or shutoff switches and controls located away from the equipment to permit safe shutdown during emergency conditions.

6.1.6 Design Concepts and Constraints

Design concepts and constraints are specific to each alternative and to each location.

6.1.7 Unit Design Considerations

Unit design considerations vary with the alternative selected and the site on which the alternative is being implemented.

6.2 Basis for Cost Estimate

Costs for construction, materials, operation and maintenance (O&M) were used to compare between the alternatives. Costs are based on 2012 present worth dollars.

6.2.1 Construction/Material Costs

Cost for construction/materials are based on estimates provided by industry professionals, previous experiences and industry standards.

6.2.2 Contingencies

Cost estimates are only as accurate as the data used for the estimate. The estimates used in this report are based on engineering that is not complete nor well defined which gives the estimate uncertainty. For the purpose of this report a contingency of 30% was added to account for additional unknown expenditures.

6.2.3 Engineering

Cost for engineering includes cost of investigation, planning, designing, surveying, specification and drawings preparation and preparing the operation and maintenance manual. Engineering costs typically range from 10% to 25% of the total project contract costs depending on the size and complexity of the project. For this report, an engineering fee of 20% was added to the project contract price.

6.2.4 Legal and Administrative

Administrative costs include costs associated with the City's record keeping, planning, and meetings during planning and construction of a major project. Legal costs include costs associated with preparing contract documents and any other legal issues that may arise during the construction process. For this report, legal and administration fees are assumed to be 9% of the project contract price.

6.3 Water Quality Impact

6.3.1 Background Data on the Receiving Stream

The Little Luckiamute River is part of the Willamette River basin and Middle Willamette Sub-basin. The Little Luckiamute River drains approximately 29 square miles upstream of the Falls City treatment plant. The Little Luckiamute River connects to the Luckiamute River approximately 10 miles to the southeast of Falls City. The Luckiamute connects to the Willamette River an additional 13 miles to the southeast from where the Little Luckiamute and Luckiamute Rivers meet.

The only recorded flow for the Little Luckiamute River near Falls City was logged from 1964 to 1971. The stream gauge (USGS 14190100) was located approximately one half mile west of the city limits, but stopped logging data for reasons beyond the scope of this report on September 30, 1971. There is a current stream gauge (USGS 14190500) located approximately 11 miles to the southeast of Falls City near Suver, OR; however, this portion of the Little Luckiamute is downstream and flows are much higher

and therefore not considered relevant for this report. The average daily flows for Station 1419100 can be seen in Table 6-3 below.

Table 6-3 - Daily Mean Flows for the Little Luckiamute River (October 1964 to September 1971)

Day of month	Stream Gauge USGS 14190100 (10-1-1964 to 09-30-1971) Daily Mean Values (cfs)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	328	306	155	200	95	69	30	14	22	22	53	153
2	326	378	150	183	92	124	29	14	32	25	64	244
3	349	416	151	163	90	77	28	14	20	35	65	370
4	367	391	142	153	88	60	27	14	17	22	105	473
5	397	298	150	151	85	53	26	14	16	22	97	461
6	418	294	181	147	86	48	25	14	16	21	85	450
7	384	260	198	140	89	46	24	13	16	20	79	421
8	331	244	280	150	94	43	24	13	14	27	154	314
9	368	255	383	227	91	43	24	13	13	38	176	292
10	372	301	330	205	88	42	24	13	13	31	184	411
11	334	279	317	204	84	42	24	13	14	35	311	417
12	322	236	296	185	81	39	24	13	13	49	333	444
13	442	217	265	201	78	40	23	13	13	50	247	454
14	510	208	287	165	74	39	22	13	17	56	205	372
15	541	234	336	151	74	36	21	12	18	69	177	323
16	536	325	325	142	89	34	20	12	17	53	211	322
17	498	321	311	140	74	33	20	12	19	40	158	260
18	496	360	294	142	70	34	20	12	30	34	158	240
19	536	470	252	149	68	34	19	14	27	32	154	208
20	467	350	236	135	64	33	18	13	27	46	155	192
21	416	340	216	122	61	31	18	13	20	61	157	193
22	396	316	225	115	58	32	17	13	17	102	176	255
23	430	298	269	118	54	34	17	17	27	118	196	353
24	372	265	253	123	52	33	17	17	22	77	262	357
25	473	229	234	121	57	51	17	20	20	59	189	287
26	520	200	240	117	58	38	17	18	19	49	166	263
27	571	187	235	111	59	36	16	23	16	124	169	330
28	475	177	263	108	55	35	16	22	17	141	142	373
29	431	240	253	104	59	34	15	18	19	85	148	303
30	352		242	101	71	32	15	16	19	80	136	376
31	323		217		55		15	16		64		331
Monthly Average (cfs)	**422**	**271**	**248**	**144**	**74**	**43**	**21**	**15**	**18**	**54**	**158**	**330**

As seen in Table 6-3, there is a fairly drastic fluctuation in flow between the summer and winter months. Flows are much higher in the months considered wet-weather (November 1 to April 30) by the DEQ. Average flows for the wet-weather and dry-weather are 262 cfs and 38 cfs respectively.

The Little Luckiamute River has a section designated by the state for salmon and steelhead spawning at the Falls City location. The river is also listed for salmon and trout rearing and migration. Based on the DEQ Evaluation Report for the City's last discharge permit, the Little Luckiamute is considered by the state to be a High Quality Water during the winter period.

6.3.2 Water Quality Listing

Streams and lakes may be classified by DEQ as "water quality limited", (a.k.a. 303(d) List) if the water body does not meet the state water quality standards as set forth in OAR 340-041. A new or increased mass load cannot be granted in a water quality limited water body unless certain exceptions apply per OAR 340-041-0026(3)(C). In order to be granted a mass load increase, Falls City must make and satisfy the findings for the environmental and economic criteria under the Antidegradation Rule, OAR 340-041-0004. The Little Luckiamute River is not listed for any water quality limited parameters. The Luckiamute River has a "Biological Criteria" listing which may be a result of an adverse impact to fish and/or other aquatic species, the cause of which may or may not be known. The listing may impact a point source discharge (i.e. WWTP) if it can be shown that the point source discharge is a contributor to the issue.

The Willamette River has three listings in the area where the Luckiamute River connects (between river mile 105 and 110 of the Willamette). The listings are for: dissolved oxygen from Oct 15 to May 15; Biological Criteria all year; and iron all year.

6.3.3 Biochemical Oxygen Demand (BOD)/ Total Suspended Solids (TSS)

Current standards for BOD and TSS are technology based rather than water quality based. As outlined in OAR 340-041-0345, during periods of low stream flows (approximately May 1 through October 31), current standards require that treatment result in monthly average effluent concentrations below 10 mg/l BOD and 10 mg/l TSS.

During periods of high stream flows (approximately November 1 through April 30), a minimum of secondary treatment, or equivalent treatment, must be provided. Secondary treatment is defined as monthly average effluent BOD and TSS concentrations below 30 mg/L for BOD and TSS with removal efficiencies of 85%. For lagoon treatment systems a TSS limit of 50 mg/L and a removal efficiency of 65% is required during the period of high stream flows. The current limits for the Falls City Treatment Plant are in Section 6.1.3.

6.3.4 Temperature

High water temperatures adversely affect salmonid fish, such as trout and salmon, as well as other cold-water aquatic species. Temperature is also important because it controls the solubility of dissolved oxygen (DO) in water. As temperature increases, the DO saturation concentration decreases and it becomes more difficult to maintain adequate DO levels. The state temperature rules are governed by OAR 340-041-0028. Salmon and steelhead spawning is a designated use in a section of the Little Luckiamute River from January 1 through May 15. During this period, the applicable temperature criterion is 13 °C (55.4 degrees Fahrenheit). For the remainder of the year, salmon and trout rearing and migration is the designated use with an applicable temperature criterion of 18 °C (64.4 degrees Fahrenheit).

Falls City does not measure the temperature of its wastewater effluent; however, in DEQ's Evaluation Report for the treatment plant's last permit, the maximum effluent temperature was estimated by DEQ to be 15°C, based on similar treatment plants. It was determined by DEQ, that at a flow of 26,000 gpd, the effluent would not impact the temperature requirement for the water body. It is assumed that the projected flows from Falls City are small enough, that temperature would still not be an issue, but an evaluation may need to be conducted to know for sure. The permittee would only discharge to the river during the wet period when water temperatures are cooler.

6.3.5 Bacteria

Based on OAR 340-041-0009, the current basin standards for bacteria are a 30-day log mean of 126 E. coli organisms per 100 ml (based on a minimum of 5 samples), with no single sample exceeding 406 E. coli organisms per 100 ml.

6.3.6 Dissolved Oxygen

Dissolved Oxygen (DO) water quality standards are listed in OAR 340-041-0016. The in-stream DO requirements vary depending upon the habitat classification of the waterway. For water bodies identified as having a salmonid spawning use as well as any active spawning area used by resident trout species, the following criteria apply during the applicable spawning through fry emergence periods.

- The dissolved oxygen may not be less than 11.0 mg/l. However, if the minimum intergravel dissolved oxygen, measured as a spatial median, is 8.0 mg/l or greater, then the DO criterion is 9.0 mg/l.
- Where conditions of barometric pressure, altitude, and temperature preclude attainment of the 11.0 mg/l or 9.0 mg/l criteria, dissolved oxygen levels must not be less than 95 percent of saturation.
- The spatial median intergravel dissolved oxygen concentration must not fall below 8.0 mg/l.
- For water bodies identified by the Department as providing cold-water aquatic life, the dissolved oxygen may not be less than 8.0 mg/l as an absolute minimum. Where conditions of barometric pressure, altitude, and temperature preclude attainment of the 8.0 mg/l, dissolved oxygen may not be less than 90 percent of saturation.

The Little Luckiamute River in the vicinity of Fall City is designated as providing spawning from January 1 to May 15. Therefore, the dissolved oxygen standard in the Little Luckiamute River is 11.0 mg/L for that period with the exceptions listed above. For the remainder of the year, the Little Luckiamute River is designated cold water aquatic life (salmon and trout rearing and migration). Therefore, the dissolved oxygen standard is 8 mg/L from May 16 to December 31.

The Luckiamute River is not designated as providing spawning habitat; however it is designated as providing salmon and trout rearing and migration habitat. Therefore, the dissolved oxygen standard is 8 mg/L year round.

The Willamette River downstream of the study area is designated as having salmon and steelhead spawning use from October 15 to May 15. The minimum DO criteria is 11 mg/L with the exceptions listed above. The remainder of the year, the Willamette River is designated cold water aquatic life (salmon and trout rearing and migration). Therefore, the dissolved oxygen standard during May 16 to October 14 is 8.0 mg/L.

6.3.7 pH

As outlined in OAR 340-041-0345, the Willamette Basin Water Quality Standard specifies an allowed pH range of 6.5 to 8.5. Typical practice in NPDES permits is to limit effluent pH to the range of 6.0 to 9.0. However, for each proposed outfall, DEQ will evaluate the mixed pH within the mixing zone to ensure that the 6.5 to 8.5 pH range is met at the edge of the mixing zone. Depending on the results of the analysis, DEQ may require a more restrictive pH range than 6.0 to 9.0.

6.3.8 Turbidity

Current DEQ standards require that discharge of treated effluent may not increase turbidity of the receiving stream by more than 10 percent as measured relative to a control point immediately upstream of the discharge point (OAR 340-041-0036). The DEQ is currently evaluating modifications of the turbidity standard that will likely result in changes in the near future.

6.3.9 Toxic Substances

OAR 340-041-0033 regulates the discharge of toxic substances to water bodies. Quality Criteria for Water lists standards for both acute toxicity and chronic toxicity. Acute toxicity limits are the values that cannot be exceeded for more than 1 hour every 3 years. Chronic toxicity limits represent the maximum 4-day-average value that cannot be exceeded more than once every 3 years. OAR 340-041-0053 allows DEQ to designate an mixing zone to allow for dilution of WWTP effluent in the receiving water body. The mixing zone consists of an acute mixing zone, or zone of immediate dilution (ZID), and a larger chronic mixing zone. The toxic substances of concern for Falls City are:

- Chlorine Toxicity: No chlorine or chlorine compounds will be allowed in the receiving water.
- Ammonia Toxicity: Ammonia toxicity is affected by the temperature and pH of the water. DEQ completed a reasonable potential analysis for ammonia for the City's last permit and determined that no reasonable potential exists for exceeding the ammonia standard in the Little Luckiamute River. It is assumed that the projected flows from Falls City are small enough, that ammonia would still not be an issue, but an evaluation may need to be conducted to know for sure. The permittee would only discharge to the river during the wet period.

6.3.10 Anticipated Discharge Permit

The City will require a mass load increase to accommodate future flows and loads into the Little Luckiamute River. According to the 2011 DMR the current facility has generally been meeting NPDES permit effluent limits (See Section 5.2).

6.4 Groundwater Protection

OAR 340-040 details state standards for groundwater protection. Paragraph 340-040-0030(3)(b) states that for new facilities, the groundwater pollutant concentration limits shall be at background levels for all contaminants. Historically, DEQ's interpretation of this standard has required that all earthen impoundments for wastewater or treated effluent—including sewage treatment lagoons, effluent holding ponds, and constructed wetlands—be lined with impervious material to prevent leakage into the underlying groundwater. This standard also precludes the discharge of treated effluent to groundwater unless all contaminants are first treated to background levels.

6.5 Design Capacity of Collection System and Wastewater Treatment Plant

The design capacities are heavily dependent on the amount of I/I that is occurring. Reductions in I/I will reduce the capacity needed for the collection system and the treatment plant.

6.5.1 Collection System

One way to look at the infiltration is per unit of pipe length and size versus a comparison of the average dry weather flow (ADWF) to average wet weather flow (AWWF). Currently the ADWF is 23,000 gpd and the AWWF is 41,000 gpd. The AWWF is almost twice the ADWF which makes it appear that there is a lot of infiltration in the system. The collection system consists of 20,000 feet of main piping that is predominantly 4" diameter. A common unit of I/I measurement is per in-mile of pipe which is the diameter of the pipe multiplied by the length for a sewer basin. For Falls City, the total in-miles of pipe for their collection system would be approximately, 15.15 in-miles. Subtracting the ADWF from the AWWF we obtain an average infiltration of 18,000 gpd. Dividing by the total in-miles of the collection system, the average infiltration is in terms in in-miles is 1,188 gpd/in-mile. Based on our experience this is a very low number in terms of infiltration and would not be economically feasible to remove.

It is difficult to predict how the projected additional 55 EDU's will be distributed over the current wastewater system. It is assumed that the projected EDU's will not be concentrated in one area within the City, therefore, the existing collection system is expected to have enough capacity provided there is not a significant increase in I/I. If the new development is concentrated in one area of the City then it may be necessary to increase the pipe size. If I/I is reduced, the collection system should continue to perform satisfactory throughout its effective life span. Any deficiencies found during inspections of the collection system should be fixed promptly to assure that the collection system is working properly.

The collection system and pumps should be sized to be able to handle the maximum instantaneous flow. The maximum recorded daily flow in 2011 was 74,000 gallons/day. The system will also have to accommodate the projected additional 55 EDU's which will increase the flow by 23,000 gallons/day. Rounded up, a total 2032 design capacity of 100,000 gallons/day will be used for design of collection components.

6.5.2 Wastewater Treatment Plant Facilities

As stated before, design capacities for the wastewater treatment plant are heavily dependent on the amount of I/I that is occurring. The design capacity for the wastewater system is also dependent on which alternative is selected.

If the existing wastewater system is selected to continue to treat the STEP/STEG sewage then a significant reduction of I/I will have to occur. As stated in section 4.2.4, the existing RGF is sized to treat a maximum of 37,500 gallons/day. Flows would have to be reduced to a level below 37,500 gallons/day. This may be possible with a drastic reduction in I/I; however, this will be difficult to do. The current wastewater system will not be able to treat 100,000 gallons/day. If the existing wastewater treatment plant is selected as the preferred alternative for continued use, the system will not be able to accommodate any additional connections. It should be noted however, that test data submitted by the City on Daily Monitoring Reports has generally been in compliance with the NPDES permit limits.

If the existing wastewater plant was expanded to support extra capacity, the new plant should be designed to treat the full 100,000 gallons/day. The drainfield would also have to be sized to support this flow. A drainfield sized to dispose of 100,000 gallons/day would require substantial area and new property would need to be obtained.

DEQ has suggested "buffering" fluctuations in flow by installing additional tankage. Using the DMR data for the period February 5, 2011 to April 7, 2011, when flows are consistently over 80% of the original design value, 1.25 M gallons of tankage would be required. Assuming installation of Xerxes 20,000-gallon fiberglass tanks were used, it is estimated that the cost would be $6,240,000. The tanks would take approximately an acre of land and required a pump station to transfer the liquid back to the recirculation tank.

DEQ also requested the graphs below, Figures 6-1 and 6-2, which show the relationship between treatment plant inflow and effluent quality (BOD and TSS).

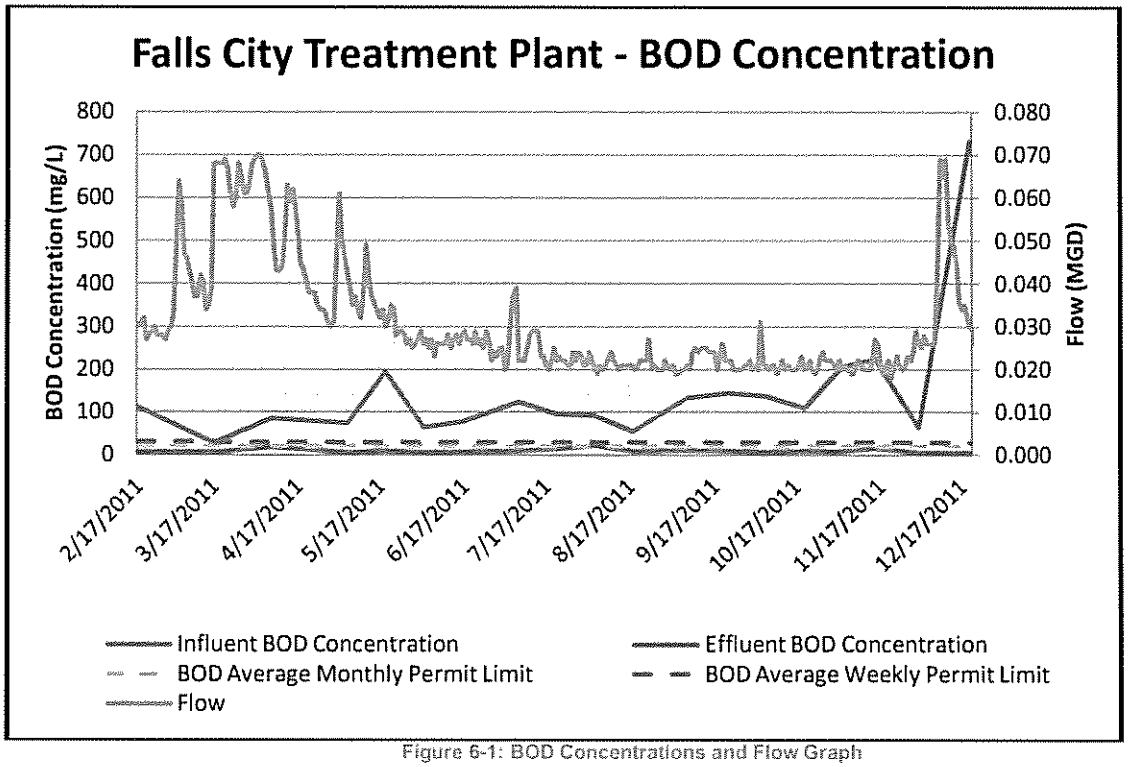


Figure 6-1: BOD Concentrations and Flow Graph

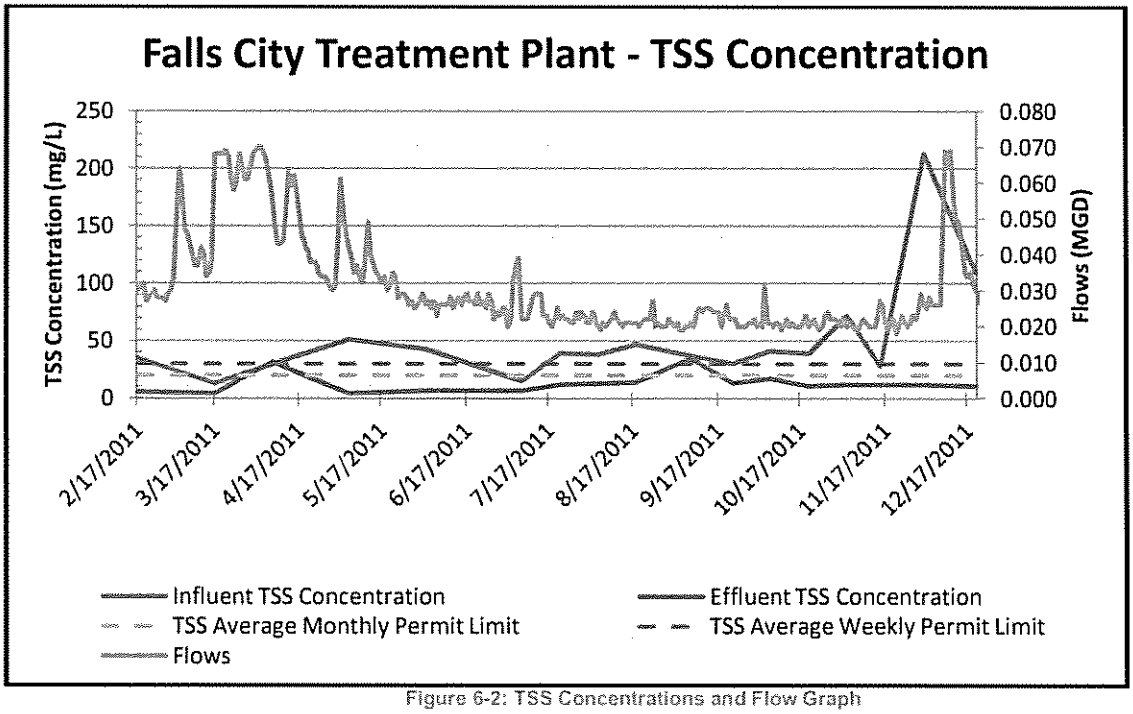


Figure 6-2: TSS Concentrations and Flow Graph

If a lagoon alternative is selected as the preferred alternative, the design flow can be much smaller because the lagoon can be sized to accommodate a surcharge volume. Lagoons can store the STEP/STEG sewage during high flow events for gradual discharge. If a lagoon option is selected, it will

be sized for the current average wet-weather flow of 41,000 gallons/day with an additional 23,000 gallons/day for future connections for a total daily flow of 64,000 gallons with an additional surcharge for the larger flow events. Rainfall has been included in the determination of the required lagoon volume.

6.5.3 SEASONAL LAND IRRIGATION

Seasonal land irrigation for landscape or agricultural uses is an encouraged method of disposal for treated effluent especially in small rural communities like Falls City. Rules for recycled water use are stated in OAR 340-055.

Due to the high precipitation rates that Falls City receives during winter months, land irrigation is only viable between May 1st and October 31st. If seasonal irrigation is desired, the City will need to submit an Effluent Reuse Plan for DEQ's approval.

6.5.3.1 Agricultural Uses

There are many properties near the City's incorporated limits that could potentially benefit from recycled water (reused effluent) irrigation. It would need to be determined by the property owners and the City if it would be economical to pump the recycled water to those agricultural sites.

Irrigation for agricultural use is limited to certain applications and rules per OAR 340-055. Some of the limitations for effluent reuse include: cannot be used on crops grown for human consumption or animals that are used for production of milk, cannot be applied via sprinklers unless it can be proven that it will not be harmful for humans and permission given by DEQ and minimum setback distances are required.

Figure 6-3 shows there are ten lots that are greater than five acres in size, appear to use or may benefit from irrigation for farm applications and are within one mile of the Falls City treatment plant. Further investigation of these sites would be needed to assure that they meet all of the DEQ regulations for effluent reuse.

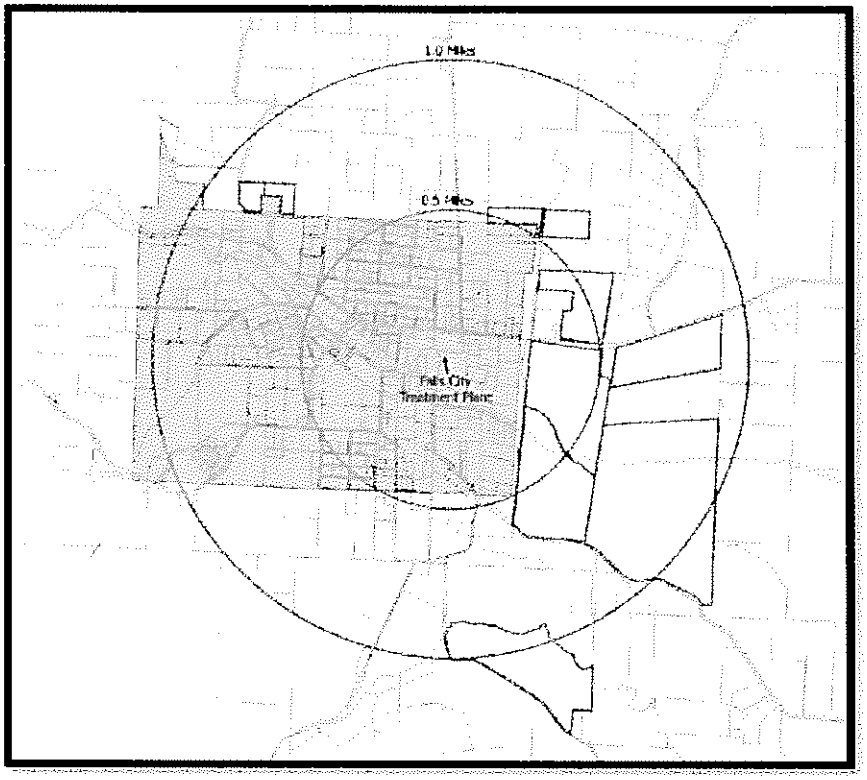


Figure 6-3 - Possible STEP/STEG sewage Reuse Sites (>5 acres and within 1 mile of the treatment plant)

6.5.3.2 Public Irrigation

The recycled water can also be used by the City to irrigate city owned properties. Treatment standards get substantially stricter if the irrigated land is open to the public or human contact. Currently the City does not own property that would be useful for disposal, so property would need to be acquired.

7 DEVELOPMENT AND EVALUATION OF ALTERNATIVES

7.1 COLLECTION SYSTEM ALTERNATIVES

7.1.1 BASIC ALTERNATIVES

It is assumed that the projected EDU's will not be concentrated in one area within the City. Therefore, the existing collection system is expected to have enough capacity provided there is not a significant increase in I/I. If the new development is concentrated in one area of the City it may be necessary to increase the pipe size. Performing pressure testing on the collection system will give a clear status of the system and deficient sections should be fixed or replaced as soon as possible.

I/I management practices will affect collection system capacity. If I/I volumes increase, the collection system capacity in some areas may exceed capacity. Exceeded capacity will have symptoms including surfacing STEP/STEG sewage from cleanouts and back-ups into home fixtures.

7.1.1.1 Fairoaks Pump Station Relief

Many problems have been associated with the Fairoaks Pump Station over the years according to the City's Public Works Department. Significant I/I is occurring at the pump station. Some I/I is occurring partly from the pump station itself and some due to the septic/collection system. Since there have been many problems associated with the Fairoaks Pump Station, a possible alternative is to remove the Fairoaks Pump Station by installing a gravity line down the right-of-way on Fairoaks Street and Ellis Street. This would reduce maintenance/power costs associated with the pump station. This would also provide a much more reliable collection system. Plans to eliminate the Fairoaks Pump Station were made in 2000 by K&D Engineering. The Fairoaks Pump Station bypass was never built due to budgetary reasons. If the bypass is of interest to the City, new plans would be required.

7.1.2 COLLECTION CONVEYANCE

The current NPDES permit requires the City to have a long term collection system replacement plan in place because the City failed to isolate I/I. It is presumed that at least a portion of the collection system is functioning well, but there is no data available to support that presumption. Replacing the entire system would be costly. To reduce costs, it is recommended that the City develop a systematic testing and data recording program in an attempt to isolate problem areas that need replacement while verifying areas that are in good condition.

7.2 WASTEWATER TREATMENT ALTERNATIVES

7.2.1 BASIC ALTERNATIVES

There are four treatment alternatives in consideration for the Falls City treatment plant. The selected options were deemed cost effective for communities like Falls City and can be seen below.

1. Recirculating Gravel Filter System (CURRENT SYSTEM).
2. Supplement the existing facility with additional capacity from a prefabricated plant (i.e. AdvanTex system).
3. Install a treatment lagoon to store and treat STEP/STEG sewage.
4. Continue to use the RGF and upgrade as required for additional capacity, but discharge 100% of the STEP/STEG sewage to the river in winter or to a lagoon for irrigation in the summer.

7.2.1.1 Recirculating Gravel Filter (RGF)

Fall City currently utilizes a RGF type system. Gravel Filters, with frequent small doses, produce a high-quality effluent that is low in BOD, TSS, turbidity and ammonia. Recirculating filters return a portion of the treated effluent back to the recirculation tank to be comingled with STEP/STEG sewage coming in from the collection system.

The RGF has been in service for over 26 years and has been running consistently over its design capacity during wet weather months. The RGF would either need to be expanded to accommodate current flows or a significant reduction in I/I must occur to reduce flows to the volume that the existing RGF was designed to treat.

7.2.1.2 Prefabricated Plant System

Prefabricated plants are gaining popularity and are a good option for small communities like Falls City.

Prefabricated plants are easy to install but do require regular system maintenance. Upgrades to the existing control panel would be required to provide additional control and monitoring of the system. This option would also require an expanded drainfield with City owned/leased area for a redundant drainfield in the event the primary drainfield fails.

7.2.1.3 Treatment Lagoon

A treatment lagoon is another popular alternative for small communities like Falls City. Lagoons treat STEP/STEG sewage by allowing sufficient detention time for microorganisms to consume harmful bacteria and organisms. The lagoon would also store the effluent until it can be discharged into the Little Luckiamute River or for irrigation on agricultural land. Lagoons require little maintenance but do require land area.

7.2.1.4 Continue RGF Use with Effluent Discharged to River or Lagoon

DEQ suggested considering continued-use of the Recirculating Gravel Filter with final effluent disposed into the river during winter months or a lagoon/irrigation reservoir in summer months. Generally, the RGF has treated effluent to permit standards and the alternate disposal sites would eliminate the issue with the drainfield under the High School Football Field.

7.2.2 Selection

Comparing cost, feasibility and ease of maintenance, the recirculating gravel filter and treatment lagoon alternatives will be considered for further evaluation (See Section 8). Both treatment options provide a cost-effective alternative that are well suited for Falls City.

Although the prefabricated plant system is a good option for the City, the cost of installing additional primary and redundant drainfields along with the maintenance required by these systems is not a viable option for Falls City.

7.3 Disinfection Alternatives

Disinfection is a process that destroys disease-causing organisms through chemical agents, physical agents, mechanical means or radiation.

7.3.1 Basic Alternatives

There are two widely used disinfection alternatives that are viable for Falls City. These alternatives include:

- Chlorine Disinfection
- Ultraviolet (UV) Disinfection

7.3.1.1 Chlorine Disinfection

Chlorine is a widely used type of disinfectant. Chlorine is thoroughly mixed with the effluent and allowed sufficient detention time to fully disinfect. Then the effluent is dechlorinated typically using Sodium Bisulfite. Chlorination is a relatively low cost alternative to treatment; however, it is highly toxic and highly corrosive. Chlorine disinfection would require significant alterations to existing wastewater facilities.

Chlorine disinfection would be needed to supplement treatment from the lagoon option.

7.3.1.2 UV Disinfection

The Falls City treatment plant currently uses UV disinfection to treat flows up to 26,000 gallons/day during wet-weather months. UV disinfection uses ultra violet light to cause photochemical damage to RNA and DNA within the cells of the organisms which renders the cells inactive (Crites-Tchobanoglous). UV disinfection is dependent on contact time, so increased flows as suggested in Alternative #4 would require a new, larger UV system.

7.3.2 Selection

Since the existing treatment plant is configured for partial UV disinfection of the effluent, UV treatment will be considered as a viable alternative and will be considered for further evaluation. Chlorine disinfection would require substantial alterations to the existing facility and was deemed not cost effective. If the lagoon alternative is selected, chlorine disinfection will be considered.

7.4 Effluent Disposal Alternatives

7.4.1 Wet-Weather Alternatives

There are two viable wet-weather effluent disposal alternatives that will be considered for Falls City.

These effluent disposal methods include:

- Discharge into a drainfield.
- Discharge into the Little Luckiamute River.

7.4.1.1 Drainfield

The Falls City treatment plant is currently permitted to discharge up to 53,200 gallons/day into the drainfield located under the High School football field. Effluent disposal into a drainfield is a very good and widely used method. Drainfield disposal requires little maintenance which makes it a very good option.

No redundant drainfield currently exists for the wastewater treatment plant. If the treatment plant is designed to handle a larger capacity, additional primary and redundant drainfields will need to be installed.

7.4.1.2 Discharge into the Little Luckiamute

Falls City is permitted by DEQ to discharge up to 26,500 gallons/day of UV treated effluent into the Little Luckiamute River. Typically the treatment plant meets BOD and TSS limits set by the current NPDES permit. Discharging into the Little Luckiamute requires additional treatment in conjunction with treatment performed by the RGF; however, it is still a relatively low to moderately priced disposal option. Discharging into the river is also a means of disposal for lagoon-treated and disinfected effluent. A new outfall will be required and is discussed in more detail in Section 9.1.3.1.

7.4.1.3 Selection

Both alternatives are considered to be a good option for Falls City wet-weather effluent disposal and will be considered for further evaluation.

7.4.2 Dry-Weather Alternatives

There are three viable dry-weather effluent disposal alternatives that will be considered for Falls City.

These effluent disposal methods include:

- Discharge into a drainfield.
- Effluent stored in a lagoon until it can be discharged into the Little Luckiamute River during wet-weather months.
- Effluent disinfection and reuse (irrigation).

7.4.2.1 Drainfield

See section 7.4.1.1 for drainfield discussion.

7.4.2.2 Lagoon Storage

Lagoons can be used to not only treat the effluent but also to store the effluent during dry-weather periods for disposal into the Little Luckiamute River during the wet-weather months. If the lagoon alternative is selected as the preferred option, effluent will be stored in the lagoon during the dry-weather months. The NPDES max flow limit of 26,250 gallons/day would need to be increased to dispose of dry and wet-weather effluent during the wet-weather period.

7.4.2.3 Effluent Reuse (Irrigation)

See section 6.4.3 for discussion on effluent reuse.

7.4.2.4 Selection

Drainfield disposal and lagoon storage will be considered for further investigation. If deemed cost effective, effluent reuse would be used in conjunction with the lagoon alternative.

7.5 Biosolids Management

7.5.1 Ultimate Use and Disposal Alternatives

For a STEG/STEP system, the system utilized by Falls City, there are two predominate alternatives to dispose of biosolids (solid sewage build-up in the system). These options include:

- Independent contractor pumps septic tanks and dispose of at a permitted site.
- Independent contractor pumps septic tanks, stabilize biosolids with lime treatment and land apply.

7.5.1.1 Pump Septic Tanks and Dispose at Permitted Site

Currently, Falls City disposes of biosolids using this method. An independent contractor pumps the tanks per Falls City request and disposes of the biosolids at a DEQ approved site. The current NPDES permit requires that the tanks be pumped at a maximum interval of once every five years. Falls City currently pumps some tanks regularly while having no record of pumping others since their installation. A complete accounting of septic tank pumping records is presented in Appendix D. It is strongly recommended that the City adopts a strict plan for inspecting and pumping these tanks as required by the current NPDES permit while also keeping good records.

7.5.1.2 Pump Septic Tanks, Lime Treatment and Land Apply

This method includes pumping the septic tanks and stabilizing the solids with lime, then applying the solids to land for fertilizing purposes by a licensed contractor. Falls City has used this method of disposal in the past; however, due to regulatory requirements, the City has decided not to peruse this disposal method.

7.5.2 Selection

Because of stricter rules and potential health hazards associated with land application of stabilized biosolids, it will not be considered for further evaluation. Biosolids will continue to be disposed of by an independent contractor at a DEQ approved site.

7.6 Development and Evaluation of Complete Alternatives

7.6.1 Common Parameters

All alternatives considered include efforts to eliminate or greatly reduce the amount of I/I that is occurring.

7.6.2 Development of Five Complete Alternatives

7.6.2.1 Alternative 1 – Repair Deficiencies in Existing System

Continue using the existing facility but make a focused, well-defined effort to reduce the I/I and implement a rigid management and maintenance plan.

This alternative will help reduce the flows to a more manageable volume; however, it is uncertain how long the existing treatment system will continue to treat the STEP/STEG sewage in a satisfactory manner.

Advantages:

- No new construction.
- Can be implemented incrementally, if a well-defined plan is followed. This spreads costs out over time.
- Some or all of the effort/cost of this alternative will be required for Alternatives 2 and 3.

Disadvantages:

- The City has tried to correct I/I on at least two occasions and failed.
- Private and public connection components must be scrutinized.
- Some investigative operations will need to be conducted during wet-weather.
- Some investigative operations are best performed while residents are not using the system (night time operations on private property).
- Intensive management of on-going, coordinated, I/I reduction measures would be required.
- This alternative does not have any redundancy (backup).
- This alternative does not allow for any new connections to the system.
- Not adding connections fails to accommodate the 20-year build-out plan.

Concerns:

- This option is dependent on finding and resolving 100% of the I/I. While this endeavor can be addressed incrementally, it must be addressed fully. In the past, budget constraints have limited O&M. Limiting O&M is not a sustainable option.
- Some system components may already be past their useful life. This may include portions of the drainfield.

- With no redundancy in the system, any system component failure could equate to an entire system failure.
- There is no capacity for desired 20-year build-out.

7.6.2.2 Alternative 2 – Repair Deficiencies in Existing System and Install Upgrades

This alternative includes fixing the existing collection system to eliminate portions of I/I and installing upgrades to the treatment system to increase performance and to make maintenance more user friendly.

Work to be completed for Alternative 2 includes:

- Investigation of septic tanks and collection pipes to locate causes of I/I.
- Replacing recirculating gravel filter distribution system to make it easier to flush system.
- Replace deficient parts and add upgrades to the recirculation tank.
- Repair splitter weir and dosing tank.

Advantages:

- Brings the existing system to current industry standards.
- Provides more flexibility in system operation and efficiency.
- Replaces components that have been in service for 25 years.
- Can include features like:
    - Automatic telephonic notification to the system maintenance provider when system alarms are activated.
    - System analysis tools which are useful in troubleshooting.

Disadvantages:

- All of the disadvantages of Alternative 1 apply.
- Expandability would require additional property.
- Expandability to include I/I at the current flow rate could cost $700,000 and still require additional property for a drainfield.
- This alternative does not have any redundancy.
- This alternative does not allow for any new connections to the system.

Concerns:

- Like Alternative 1, this option is dependent on finding and resolving 100% of the I/I. While this endeavor can be addressed incrementally, it must be addressed fully. In the past, budget constraints have limited O&M. Limiting O&M due to budget constraints or any other reason is not a sustainable practice.
- Some system components that cannot be changed, like the drainfield, may already be past their useful life.
- Without expanding, this alternative has no redundancy.

7.6.2.3 Alternative 3 – Lagoon System

As an alternative to expanding the existing treatment plant or eliminating I/I through collection system replacement, the City has the option of using a multi-cell lagoon system to provide secondary treatment and dry-weather storage of wastewater. Wastewater would be pumped to a facultative treatment lagoon which would be discharged to a large secondary holding lagoon. During summer, the treated effluent would be stored in a holding lagoon until conditions allow discharge into the river. Summer wastewater effluent would also be available for spray irrigation. Due to site restrictions at the existing WWTP, locating a lagoon system would require the City of Falls City to redirect the wastewater influent to a new suitable

location. A possible site for a storage lagoon has been identified just east of the city limits along the Little Luckiamute River.

This option would allow the City to abandon their current treatment plant and drainfield and eliminate the need to replace their collection system. However, a pump station would be required to redirect the waste stream from the current treatment plant location to the new lagoon site. It is likely the existing recirculation tank could be retrofitted to be used as the pump station. In addition to the lagoons and pump station, this alternative would require a new chlorine disinfection facility, contact basin, dechlorination equipment, and river outfall.

Advantages:

- Easy to operate.
- Requires little energy.
- Eliminates the costly need to replace the collection system.
- Easily expandable.
- Effective at removing settleable solids.
- Can easily deal with intermittent and peak flows.

Disadvantages:

- Settled sludge and inert material require periodic removal (although infrequent – possibly not within the 20-year design period).
- Difficult to control or predict ammonia levels in effluent.
- Mosquitoes and other similar insect vectors (insects that transfer diseases from one host to another) can be a problem if emergent vegetation is not controlled with regular maintenance.
- Requires a relatively large area of land.
- Odors can occur if allowed to go anaerobic.
- Burrowing animals can damage berms if not controlled.

Concerns:

- This alternative would likely require the City's NPDES permit to be rewritten to allow effluent discharged to Little Luckiamute River to have BOD and TSS concentration of 30 mg/L.
- This alternative may also require applying for a mass load increase. The mass load increase would be a result of population growth, higher BOD and TSS effluent concentrations (30/30) and an increase in loads due to storing the summer flows and discharging during the winter. It is anticipated that the projected discharge flows are low enough that the water quality of the Little Luckiamute River will not be impacted outside the mixing zone, but an analysis will need to be conducted to know for sure.
- The holding of anaerobic sewage, which is typically found in septic tanks, will likely have an unwelcomed odor. To reduce odor, or provide additional treatment if necessary, aeration can be added to the lagoons.
- Land for the lagoon will more than likely need to be procured outside of the city limits.

7.6.2.4 Alternative 4 – Use the RGF and discharge effluent to the River or Lagoon

Continue using the existing facility but route the final discharge of treated effluent to the river in winter months and to a lagoon in summer months. During summer months water stored in the lagoon would be used for irrigation. DEQ suggested this alternative to eliminate the drainfield under the football field while still using the RGF, which has been treating effluent adequately.

Advantages:

- Eliminates the drainfield, which is located under the High School football field.

- Continues to use the existing RGF.
- Offers alternate disposal methods for STEP/STEG sewage.
- Provides a "re-use" component to the treatment system.
- May provide for additional capacity.

Disadvantages:

- The RGF will need to be expanded or augmented with new recirculating filter technology to accommodate the additional capacity requirement.
- New controls and pumps will be needed if the recirculating filter system is expanded.
- New recirculation tanks will be needed if the capacity of the recirculation filter is increased to meet 20-year planning period.
- The capacity of the Ultraviolet disinfection unit would need to be reviewed and/or replaced as necessary for the design flow.
- Land, which the City does not currently own or possess rights to, will be required for the summer time lagoon system.
- A new pump station will be needed to pump STEP/STEG sewage to the lagoon.
- A transmission line will need to be constructed from the new pump station to the lagoon.
- Irrigation considerations will need to be met.

Concerns:

- This option assumes that the RGF, which is operating during peak flow conditions at approximately 200% of the design capacity, will continue its current level of service for 20 more years.
- The effort and expense of this alternate will be slightly less than the combined cost of Alternatives 2 & 3.
- Some system components may already be past their useful life.

7.6.2.5 Alternative 5 – No Action

This alternative includes doing nothing to the current wastewater facility. The DEQ and the City have expressed that doing nothing is not a viable alternative and will not be considered any further. The drainfield located under the football field presents a potential health hazard. Additional flow from the connection of future homes may cause a system failure.

7.6.3 MATRIX EVALUATION

	Description	Requires I/I reduction	Requires additional property	Expandable/ redundancy	Vacates football field
Alt 1	Repair Existing System	Yes	No	No	No
Alt 2	Repair Existing System with upgrades	Yes	No	No	No
Alt 3	Lagoon	Yes	Yes	Yes	Yes
Alt 4	RGF with discharge to river or lagoon	Yes	Yes	Yes	Yes
Alt 5	No Action	No	No	No	No

8 FINANCING OPTIONS

Most communities are unable to finance major infrastructure improvements without some form of governmental funding assistance such as low interest loans or grants. Below, a number of major Federal/State funding programs and local funding mechanisms are discussed. Projects are usually funded by a combination of grant, loan and local funds.

8.1 GRANT AND LOAN PROGRAMS

A brief description of the major Federal and State funding programs is given below. These are typically utilized to assist qualifying communities in financing infrastructure improvement programs. Each of the government assistance programs has its own particular prerequisites and requirements. These assistance programs promote such goals as aiding economic development, benefiting areas of low to moderate income families, and providing for specific community improvement projects. With each program having its specific requirements, not all communities or projects may qualify for each of these programs. *Oregon Water & Wastewater Funding and Resource Guide*, prepared by Rural Community Assistance Corporation (RCAC) is provided in Appendix B.

8.1.1 OREGON COMMUNITY DEVELOPMENT BLOCK GRANT (OCDBG) PROGRAM

The Oregon Business Development Department Infrastructure Finance Authority (OBDD-IFA) administers the State's annual federal allocation of CDBG funds. Funds for the program come from the U.S. Department of Housing and Urban Development. OCDBG funds under the Public Works category are targeted to water and wastewater systems.

Only non-metropolitan cities and counties in rural Oregon can apply for and receive grants. Cities and counties may undertake projects to improve existing facilities owned by other public bodies, such as water or sanitary districts. A city or county can only have one CDBG application under consideration by the State at any one time. Applications are not accepted when a jurisdiction has three or more administratively open CDBG projects. Applications may be submitted year around.

OCDBG grants are available for each of three phases necessary to complete water and/or wastewater system improvements: preliminary engineering and planning, final engineering, and construction. Engineering costs are limited to 20% of the total budget. No matching funds are required. The maximum grant available for a single project is $2,000,000 or $20,000 per permanent residential connection, whichever is less. This maximum grant allocation covers all aspects of the single project for a five year period. Projects may not be separated into phases in order to apply for more than the maximum grant funding during the five year period.

Grants awarded may be used for the following public works projects:

- Projects necessary to bring municipal wastewater systems into compliance with the requirements of the Clean Water Act by the Oregon Department of Environmental Quality.
- Projects where the municipal system has not been issued a notice of noncompliance from the Department of Environmental Quality, but the department determines that a project is eligible for assistance upon finding that: a recent letter, within the previous twelve months, from the appropriate regulatory authority (DEQ) or their contracted agent, indicating a high probability that within two years the system will be notified of non-compliance, and department staff deems it reasonable and prudent that program funding will assist in bringing the wastewater system into compliance with current regulations or requirements proposed to take effect within the next two years.
- Planning, design and construction projects necessary for the provision of dependable and efficient wastewater collection, treatment, and disposal/re-use.
- The acquisition of real property, including permanent easements, necessary for the proposed wastewater project.

Projects eligible for funding must be to solve problems faced by current residents, not projects intended to provide capacity for population and economic growth. CDBG funds may be used in projects that are needed to benefit current residents but which will be built with capacity for future development. In these cases, the CDBG participation is limited to that portion of the project cost that is necessary to serve the current population.

In order to be eligible for CDBG, a system must serve at least 51% permanent residents who are characterized as low or moderate income based on the most recent OBDD Method of Distribution and the monthly user rate at construction completion must meet program threshold rate criteria. The Threshold rate criteria states that by completion of the proposed project, the average system annual water rate is equal to or exceeds 1.25% of the current MHI as defined by the most recent *American Community Survey 5-Year Estimate.*

For additional information on the CDBG programs, call (503)-986-0123 or visit the OBDD-IFA website at http://www.orinfrastructure.org/Learn-About-Infrastructure-Programs/Interested-in-a-Community-Development-Project/Community-Development-Block-Grant/

8.1.2 Water/Wastewater Financing Program

The 1993 Legislature created the Water/Wastewater Financing Program for communities that must meet Federal and State mandates to provide safe drinking water and adequate treatment and disposal of wastewater. The legislation was intended to assist local governments in meeting the Safe Drinking Water Act and the Clean Water Act. The fund is capitalized with lottery funds appropriated each biennium and with the sale of state revenue bonds. The Oregon Business Development Department Infrastructure Financing Authority (OBDD-IFA) administers the program.

Program eligibility is limited to projects necessary to ensure compliance with the Safe Drinking Water Act or the Clean Water Act where a Notice of Non-Compliance has been issued. Cities, counties, districts and other public entities may apply to the program.

Eligible activities include the following:

- Water source, treatment, storage, and distribution improvements.
- Wastewater collection and capacity.
- Storm system.
- Purchase of rights of way and easements necessary for infrastructure development.
- Design and construction engineering.

The grant/loan amounts are determined by a financial analysis based on demonstrated need and the applicant's ability or inability to afford additional loans (debt capacity, repayment sources and other factors). The program guidelines, project administration, loan terms, and interest rates are similar to the Special Public Works Fund program. The maximum loan term is 25 years; however, loans are generally made for 20-year terms. Loans are generally repaid with utility revenues, general funds, or voter approved bond issues. Borrowers that are "credit worthy" may be funded through sale of state revenue bonds.

Interested applicants should contact OBDD-IFA prior to submitting an application. Applications are accepted year-round. For additional information on this and other OBDD-IFA programs, call (503)-986-0123 or visit the OBDD-IFA website at http://www.orinfrastructure.org

8.1.3 Oregon Special Public Works Fund

The Special Public Works Fund (SPWF) program provides financing to municipalities (cities, districts, tribal councils, etc.) to construct, improve, and repair infrastructure in order to support local economic development and create new jobs locally, especially family wage jobs. In order to be eligible, the following conditions must be satisfied.

- The existing infrastructure must be insufficient to support current or future industrial or eligible commercial development; and

- There must be a high probability that family wage jobs will be created or retained within: 1) the boundary to be served by the proposed infrastructure project or 2) industrial or eligible commercial development of the properties served by the proposed infrastructure project.

The SPWF program is capitalized through biennial appropriations from the Oregon Lottery Economic Development Fund by the Oregon State Legislature, through bond sales for dedicated project funds, through loan repayments and other interest earnings. The Oregon Business Development Department Infrastructure Authority (OBDD-IFA) administers the fund. The following criteria are used to determine project eligibility.

The SPWF is primarily a loan program. Grant funds are available based upon economic need of the municipality. The maximum loan term is 25 years, though loans are generally made for 20-year terms. The grant/loan amounts are determined by a financial analysis based on a demonstrated need and the applicant's ability or inability to afford additional loans (debt capacity, repayment sources and other factors). Borrowers that are "credit worthy" may be funded through the sale of state revenue bonds. Loans are generally repaid with utility revenues, local improvement districts (LID's), general funds, or voter approved bond issues.

Determination of the final amount of financing and the loan/grant/bond mix will be based on the financial feasibility of the project, the individual credit strength of an applicant, the ability to assess specially benefited property owners, the ability of the applicant to afford annual payments on loans from enterprise funds or other sources, future beneficiaries of the project, and six other applicable issues.

The maximum SPWF loan per project is $10 million, if funded from SPWF revenue bond proceeds. Projects financed directly from the SPWF may receive up to $1 million. The maximum SPWF grant is $500,000 for a construction project and cannot exceed 85% of the total project cost. Grants are made only when loans are not feasible.

Technical Assistance grants and loans may finance preliminary planning and engineering studies and economic investigations to determine infrastructure feasibility. Up to $10,000 in grant funds and $20,000 in additional loan funds may be awarded to eligible applicants with fewer than 5,000 persons living within the City.

For additional information on this and other OBDD-IFA programs, call (503)-986-0123 or visit the OBDD-IFA website at http://www.orinfrastructure.

8.1.4 Water and Waste Disposal Loans and Grants (RUS)

The Rural Utilities Service (RUS) is one of three entities that comprise the USDA's Rural Development mission area. Administered by the USDA Rural Development office, the RUS supports various programs that provide financial and technical assistance for development and operation of safe and affordable water supply systems and sewer and other forms of waste disposal facilities.

Rural Development has the authority to make loans to public bodies and non-profit corporations to construct or improve essential community facilities. Grants are also available to applicants who meet the median household income (MHI) requirements. Eligible applicants must have a population less than 10,000. Priority is given to public entities in areas smaller than 5,500 people to restore a deteriorating water supply, or to improve, enlarge, or modify a water facility and/or inadequate waste facility. Preference is given to requests that involve the merging of small facilities and those serving low-income communities.

In addition, borrowers must meet the following stipulations:

- Be unable to obtain needed funds from other sources at reasonable rates and terms.
- Have legal capacity to borrow and repay loans, to pledge security for loans, and to operate and maintain the facilities.
- Be financially sound and able to manage the facility effectively.
- Have a financially sound facility based on taxes, assessments, revenues, fees, or other satisfactory sources of income to pay all facility costs including operation and maintenance, and to retire the indebtedness and maintain a reserve.

- Water and waste disposal systems must be consistent with any development plans of State, multi-jurisdictional area, counties, or municipalities in which the proposed project is located. All facilities must comply with Federal, State, and local laws including those concerned with zoning regulations, health and sanitation standards, and the control of water pollution.

Loan and grant funds may be used for the following types of improvements:

- Construct, repair, improve, expand, or otherwise improve water supply and distribution facilities including reservoirs, pipelines, wells, pumping stations, water supplies, or water rights.
- Construct, repair, improve, expand, or otherwise improve waste collection, pumping, treatment, or other disposal facilities. Facilities to be financed may include such items as sewer lines, treatment plants, including stabilization ponds, storm sewer facilities, sanitary landfills, incinerators, and necessary equipment.
- Acquire needed land, water supply or water rights.
- Legal and engineering costs connected with the development of facilities.
- Other costs related to the development of the facility including the acquisition of right-of-way and easements, and the relocation of roads and utilities.
- Finance facilities in conjunction with funds from other agencies or those provided by the applicant.
- Interim commercial financing will normally be used during construction and Rural Development funds will be available when the project is completed. If interim financing is not available or if the project cost is less than $50,000, multiple advances of Rural Development funds may be made as construction progresses.

The maximum term on all loans is 40 years. However, no repayment period will exceed any statutory limitation on the organization's borrowing authority or the useful life of the improvement facility to be financed. Interest rates are set quarterly and are based on current market yields for municipal obligations. Current interest rates may be obtained from any Rural Development office.

There are other restrictions and requirements associated with these loans and grants. If the City becomes eligible for grant assistance, the grant will apply only to eligible project costs. Additionally, grant funds are only available after the City has incurred long-term debt resulting in an annual debt service obligation equal to ½% of the MHI. In addition, an annual funding allocation limits the RDA funds. To receive a RDA loan, the City must secure bonding authority, usually in the form of general obligation or revenue bonds.

RDA will advise the applicant as to how to assemble information to determine engineering feasibility, economic soundness, cost estimates, organization, financing, and management matters in connection with the proposed improvements. If financing is provided, the RDA will also make periodic inspections to monitor project construction.

Applications for financial assistance are made at area offices of the RDA. For additional information on RDA loans and grant programs call 1-541-673-0136 or visit the RUS website at http://www.usda.gov/rus/water.

8.1.5 Rural Community Assistance Corporation (RCAC) Financial Services

The mission of RCAC's Financial Services is to manage resources, develop programs and participate in collaborative efforts, enabling RCAC to provide suitable and innovative solutions to the financial needs of rural communities and disadvantaged populations. In 1996, RCAC was designated a Community Development Financial Institution by the US Treasury to help address the capital needs of rural communities and has since added other loan programs. These programs include community facilities (housing, educational centers, public buildings, etc.) as well as lending for water and wastewater improvements.

Long-term loans are made in communities with a population of 20,000 or fewer. The Community Facility Loan Guarantee Program from USDA Rural Development enables RCAC to make low-interest loans with amortization periods of up to 25 years. The primary goal of Financial Services is to serve low- and very-low income rural residents. The primary borrowers are nonprofit organizations and municipalities.

Additional information can be found at http://www.rcac.or

8.1.6 Clean Water State Revolving Fund (CWSRF)

The Clean Water State Revolving Fund (CWSRF) Loan Program administered by the Oregon Department of Environmental Quality (DEQ) provides low-cost loans for the planning, design and construction of a variety of projects that address water pollution. The loans through the CWSRF program are available to Oregon's public agencies, including cities, counties, sanitary districts, soil and water conservation districts, irrigation districts and various special districts.

Congress established the CWSRF in 1987, to replace the Construction Grants program, which had provided direct grants to communities to complete sewer infrastructure projects. The CWSRF program provides several types of loans and varying interest rates.

There are six different types of loans available within the program. These include traditional planning, design and construction loans. There are also loans available for emergencies, urgent repairs and local community projects. Each of these loan types has different financial terms, and is intended to provide communities with choices when financing water quality improvements. Interest rates are based on the nation's bond buyer's index and fluctuate quarterly.

Eligible projects include water quality related planning or studies, septic system repairs, wastewater reuse, various non-point source best management practices, storm water control, riparian or wetland restoration, wastewater treatment projects, irrigation improvements, interim financing for some USDA programs, major sewer replacement and rehabilitation, infiltration and inflow correction, estuary management activities, and others.

All eligible proposed projects are ranked based upon their application information and entered on the program's Project Priority List. Points are assigned based on specific ranking criteria. Newly ranked projects are integrated into the priority list on a regular basis. The Project Priority List is incorporated within DEQ's annual Intended Use Plan which indicates the proposed use of the funds each year.

Projects are funded based on the availability of loan monies. If monies are insufficient to fund all the approved projects, funds are distributed to as many projects as possible based on the Project Priority List. Each time new monies become available, those monies are allocated to as many unfunded or partially funded projects as possible.

For additional information on the CWSRF loan program, call (800) 452-4011 or visit the DEQ website at http://www.deq.state.or.us/wq/loans/srfloans.htm.

8.2 Local Funding Sources

The amount and type of local funding obligations for infrastructure improvements will depend, in part, on the amount of grant funding anticipated and the requirements of potential loan funding. Local revenue sources for capital expenditures include ad valorem taxes, various types of bonds, service charges, connection fees, and system development charges. The following sections identify those local funding sources and financing mechanisms that are most common and appropriate for the improvements identified in this study.

8.2.1 General Obligation Bonds

A general obligation (G.O.) bond is backed by the full faith and credit of the issuer. For payment of the principal and interest on the bond, the issuer may levy ad valorem general property taxes. Such taxes are not needed if revenue from assessments (user charges or some other sources) is sufficient to cover debt service.

Oregon Revised Statutes limit the maximum term to 40 years for cities. Except in the event that Rural Development Administration will purchase the bonds, the realistic term for which general obligation bonds should be issued is 15 to 20 years. Under the present economic climate, the lower interest rates will be associated with the shorter terms.

Financing of water system improvements by general obligation bonds is usually accomplished by the following procedure:

- Determination of the capital costs required for the improvement.
- An election authorizing the sale of general obligation bonds.
- Following voter approval, the bonds are offered for sale.
- The revenue from the bond sale is used to pay the capital costs associated with the projects.

From a fund raising viewpoint, general obligation bonds are preferable to revenue bonds in matters of simplicity and cost of issuance. Since the bonds are secured by the power to tax, these bonds usually command a lower interest rate than other types of bonds. General obligation bonds lend themselves readily to competitive public sale at a reasonable interest rate because of their high degree of security, their tax-exempt status, and their general acceptance.

These bonds can be revenue-supported wherein a portion of the user fee is pledged toward payment of the debt service. Using this method, the need to collect additional property taxes to retire the obligated bonds is eliminated. Such revenue-supported general obligation bonds have most of the advantages of revenue bonds, but also maintain the lower interest rate and ready marketability of general obligation bonds. Because the users of the water system pay their share of the debt load based on their water usage rates, the share of that debt is distributed in a fair and equitable manner.

Advantages of general obligation bonds over other types of bonds include:

- The laws authorizing general obligation bonds are less restrictive than those governing other types of bonds.
- By the levying of taxes, the debt is repaid by all property benefited and not just the system users.
- Taxes paid in the retirement of these bonds are IRS deductible.
- General obligation bonds offer flexibility to retire the bonds by tax levy and/or user charge revenue.

The disadvantage of general obligation bond debt is that it is often added to the debt ratios of the underlying municipality, thereby restricting the flexibility of the municipality to issue debt for other purposes. Furthermore, general obligation bonds are normally associated with the financing of facilities that benefit an entire community and must be approved by a majority vote and often necessitate extensive public information programs. A majority vote often requires waiting for a general election in order to obtain an adequate voter turnout. Waiting for a general election may take years, and too often a project needs to be undertaken in a much shorter amount of time.

8.2.2 Ad Valorem Taxes

Ad valorem property taxes are often used as revenue source for utility improvements. Property taxes may be levied on real estate, personal property or both. Historically, ad valorem taxes were the traditional means of obtaining revenue to support all local governmental functions.

A marked advantage of these taxes is the simplicity of the system; it requires no monitoring program for developing charges, additional accounting and billing work is minimal, and default on payments is rare. In addition, ad valorem taxation provides a means of financing that reaches all property owners that benefit from a water system, whether a property is developed or not. The construction costs for the project are shared proportionally among all property owners based on the assessed value of each property.

Ad valorem taxation, however, is less likely to result in individual users paying their proportionate share of the costs as compared to their benefits. In addition, the ability of communities to levy property taxes has been limited with the passage of Ballot Measure 5 and other subsequent legislation. While the impacts of the various legislative efforts are still unclear, capital improvement projects are exempt from property tax limitations if new public hearing requirements are met and an election is held.

8.2.3 Revenue Bonds

The general shift away from ad valorem property taxes and toward a greater reliance on user fees makes revenue bonds a frequently used option of long term debt. These bonds are an acceptable alternative and offer some advantages to general obligation bonds. Revenue bonds are payable solely from charges made for the services provided. These bonds cannot be paid from tax levies or special assessments; their only security is the borrower's promise to operate the system in a way that will provide sufficient net revenue to meet the debt service and other obligations of the bond issue.

Many communities prefer revenue bonding, as opposed to general obligation bonding because it insures that no tax will be levied. In addition, debt obligation will be limited to system users since repayment is derived from user fees. Another advantage of revenue bonds is that they do not count against a municipality's direct debt, but instead are considered "overlapping debt." This feature can be a crucial advantage for a municipality near its debt limit or for the rating agencies, which consider very closely the amount of direct debt when assigning credit ratings. Revenue bonds also may be used in financing projects extending beyond normal municipal boundaries. These bonds may be supported by a pledge of revenues received in any legitimate and ongoing area of operation, within or outside the geographical boundaries of the issuer.

Successful issuance of revenue bonds depends on the bond market evaluation of the revenue pledged. Revenue bonds are most commonly retired with revenue from user fees. Recent legislation has eliminated the requirement that the revenues pledged to bond payment have a direct relationship to the services financed by revenue bonds. Revenue bonds may be paid with all or any portion of revenues derived by a public body or any other legally available monies. In addition, if additional security to finance revenue bonds was needed, a public body may mortgage grant security and interests in facilities, projects, utilities or systems owned or operated by a public body.

Normally, there are no legal limitations on the amount of revenue bonds to be issued, but excessive issue amounts are generally unattractive to bond buyers because they represent high investment risks. In rating revenue bonds, buyers consider the economic justification for the project, reputation of the borrower, methods and effectiveness for billing and collecting, rate structures, provision for rate increases as needed to meet debt service requirements, track record in obtaining rate increases historically, adequacy of reserve funds provided in the bond documents, supporting covenants to protect projected revenues, and the degree to which forecasts of net revenues are considered sound and economical.

Municipalities may elect to issue revenue bonds for revenue producing facilities without a vote of the electorate (ORS 288.805-288.945). In this case, certain notice and posting requirements must be met and a 60-day waiting period is mandatory. A petition signed by 5% of the municipality's registered voters may cause the issue to be referred to an election.

8.2.4 Improvement Bond

Improvement (Bancroft) bonds can be issued under an Oregon law called the Bancroft Act. These bonds are an intermediate form of financing that is less than full-fledged general obligation or revenue bonds, but is quite useful especially for smaller issuers or for limited purposes.

An improvement bond is payable only from the receipts of special benefit assessments, not from general tax revenues. Such bonds are issued only where certain properties are recipients of special benefits not accruing to other properties. For a specific improvement, all property within the improvement area is assessed on an equal basis, regardless of whether it is developed or undeveloped. The assessment is designed to apportion the cost of improvements, approximately in proportion to the afforded direct or indirect benefits, among the benefited property owners. This assessment becomes a direct lien against the property, and owners have the option of either paying the assessment in cash or applying for improvement bonds. If the improvement bond option is taken, the City sells Bancroft improvement bonds to finance the construction, and the assessment is paid over 20 years in 40 semi-annual installments with interest. Cities and special districts are limited to improvement bonds not exceeding 3% of true cash value.

With improvement bond financing, an improvement district is formed, the boundaries are established, and the benefited properties and property owners are determined. The engineer usually determines an approximate assessment, either on a square foot or a front-foot basis. Property owners are then given an opportunity to object to the project assessments. The assessments against the properties are usually not levied until the actual cost of the project is determined. Since this determination is normally not possible until the project is completed, funds are not available from assessments for the purpose of making monthly payments to the contractor. Therefore, some method of interim financing must be arranged, or a pre-assessment program, based on the estimated total costs, must be adopted. Commonly, warrants are issued to cover debts, with the warrants to be paid when the project is complete.

The primary disadvantage to this source of revenue is that the property to be assessed must have a true cash value at least equal to 50% of the total assessments to be levied. As a result, a substantial cash payment is usually required by owners of undeveloped property. In addition, the development of an assessment district is very cumbersome and expensive when facilities for an entire community are contemplated. In comparison, general obligation bonds can be issued in lieu of improvement bonds, and are usually more favorable.

8.2.5 Capital Construction (Sinking) Fund

Sinking funds are often established by budgeting for a particular construction purpose. Budgeted amounts from each annual budget are carried in a sinking fund until sufficient revenues are available for the needed project. Such funds can also be developed with revenue derived from system development charges or serial levies.

A City may wish to develop sinking funds for each sector of the public services. The fund can be used to rehabilitate or maintain existing infrastructure, construct new infrastructure elements, or to obtain grant and loan funding for larger projects.

The disadvantage of a sinking fund is that it is usually too small to undertake any significant projects. Also, setting aside money generated from user fees without a designated and specified need is not generally accepted in a municipal budgeting process.

8.2.6 User Fees

User fees can be used to retire general obligation bonds, and are commonly the sole source of revenue to retire revenue bonds and to finance operation and maintenance. User fees represent monthly charges of all residences, businesses, and other users that are connected to the applicable system. These fees are established by resolution and can be modified, as needed, to account for increased or decreased operating and maintenance costs.

User fees should be based on a metered volume of water consumption. Through metered charges, an equitable and fair system of recovering sewer system costs is used. Flat fees and unmetered connections should be avoided. Large water users should pay a larger portion of the wastewater system costs. Through higher rates and metered billing, this can be accomplished. Another method of establishing a fair and equitable fee is through an equivalent dwelling unit basis. Section 6.1.1 analyzes the current EDU distribution using best available information.

Since the sewer customers are mostly residential and using water consumption as a basis for sewer use is not always an exact match (i.e. irrigation), Falls City uses a flat fee for their sewer system, which is based on the operational costs divided by the number of connections.

8.2.7 Connection Fees

Most municipalities charge connection fees to cover the cost of connecting new development to water and wastewater systems. Based on recent legislation, connection fees can no longer be programmed to cover a portion of capital improvement cost.

8.2.8 System Development Charges

System development charges (SDC), which currently are prohibited by charter, are essentially a fee collected as each piece of property is developed, and which is used to finance the necessary capital improvements and municipal services required by the development. Such a fee can only be used to recover the capital costs of infrastructure. Operating, maintenance, and replacement costs cannot be financed through system development charges.

The Oregon Systems Development Charges Act was passed by the 1989 Legislature (HB 3224) and governs the requirements for systems development charges effective July 1, 1991. Two types of charges are permitted under this act: 1) improvement fees, and 2) reimbursement fees. SDCs charged before construction are considered improvement fees and are used to finance capital improvements to be constructed. After construction, SDCs are considered reimbursement fees and are collected to recapture the costs associated with capital improvements already constructed or under construction. A reimbursement fee represents a charge for utilizing excess capacity in an existing facility paid for by others. The revenue generated by this fee is typically used to pay back existing loans for improvements.

Under the Oregon Systems Development Charges Act, methodologies for deriving improvement and reimbursement fees must be documented and available for review by the public. A capital improvement plan must also be prepared which lists the capital improvements that may be funded with improvement fee revenues and the estimated cost and timing of each improvement. However, revenue from the collection of SDCs can only be used to finance specific items listed in a capital improvement plan. The projects and costs developed in this Wastewater System Master Plan may be used for this purpose. In addition, SDCs cannot be assessed on portions of the project paid for with grant funding.

8.2.9 Local Improvement District (LID)

A local improvement district (LID) or multiple LIDs can be formed by the City to be responsible for securing and repaying the debt. A LID incorporates property owners within a defined boundary who agree to fund all or a portion of an improvement project. LID projects are best suited for improvements that benefit a limited number of users rather than the entire system. The formation of an LID in Falls City requires a vote.

The City may be required to assist in the LID process through facilitation and administration of the project. Agreements should be prepared detailing who will pay for engineering and planning costs, administration costs, interim financing, and other costs related to a public works project.

The LID formation process requires public hearings, at which, a remonstrance (no vote) of two thirds of the influenced area can halt the process. A successful LID area would result in liens against the LID properties at the end of the project or a full payment from all or some of the property owners.

Disadvantages to a LID include the requirement of a significant amount of time and interest from the City if they choose to administer the LID. It is not uncommon to have some or many within the LID boundary that are opposed to the project. Those in opposition to the project must either rally enough support to derail the project or work for some other compromise. The political and administrative fall out is often borne by the City.

8.2.10 Assessments

Under special circumstances, the beneficiary of a public works improvement may be assessed for the cost of a project. For example, the City may provide some improvements or services that directly benefit a particular development. The City may choose to assess the industrial or commercial developer to provide up-front capital to pay for the administered improvements.

8.3 Estimated Annual O&M and Replacement Costs of the Proposed Systems

All cost estimates are preliminary in nature. A detailed cost estimate for the preferred alternative can be seen in section 9.1.4, and has been adjusted to 2015 dollars per funding agency requirements

8.3.1 Alternative 1 – Repair Existing System

8.3.1.1 Construction Cost

The preliminary cost estimate for alternative 1 is estimated to be $673,000 dollars. This cost includes performing the investigation on the septic tanks and collection system, replacing an estimated 40% of the septic tanks and 10% of the collection system pipe. This cost estimate can vary substantially depending on the number of tanks or the length of the collection system that will need to be replaced.

This estimate includes:

- Investigating existing septic tanks and evaluation of tanks.
- Investigating existing collection system and evaluation of the system.
- Replacing 40% of the septic tanks (60 tanks).
- Replacing 10% of the collection system pipe (2,850 lf).

Table 8-1: Alternative 1 - Preliminary Cost Estimate

ALTERNATIVE 1			
Fix some of the existing system			
	Unit Cost	**Units**	**Total Cost**
Septic Tanks			
Investigation	$180.00	151	$27,180.00
Replace 40% of Tanks	$5,450.00	60	$327,000.00
Tank Total:			$354,180.00
Collection Pipe			
Investigation		LS	$10,000.00
Replace 10% of the collection system	$38.50	2850	$109,725.00
Pipe Total:			$119,725.00
Construction Subtotal:			$473,905.00
10% Contingency:			$47,390.50
Alternative 1 Construction Estimated Cost:			**$521,295.50**
20% Engineering			$104,259.10
3% Administrative Costs:			$15,638.87
6% Permitting, Bonding, Misc:			$31,277.73
Alternative 1 Total Estimated Cost:			**$672,471**

This estimate also assumes that the current drainfield will continue to be permitted for use. If a replacement drainfield is needed an additional cost of $178,000 dollars will need to be added to the estimate for a total cost of $851,000.

8.3.1.2 Operation and Maintenance (O&M) Cost

O&M cost includes, but is not limited to, costs associated with pumping all tanks within the NPDES permitted time frame, replacing deficient parts of the system as they are discovered and keeping and maintaining accurate records of work/maintenance performed including septic tank conditions and pumping dates.

It is estimated that annual O&M costs would be $30,000/year for Alternative 1.

8.3.2 Alternative 2 – Repair Existing System and Install Upgrades

8.3.2.1 Construction Cost

The preliminary cost estimate for construction, engineering, administration and permitting/bonding cost is estimated to be $819,000 dollars.

This estimate includes:

- Investigating existing septic tanks and evaluation of tanks.
- Investigating existing collection system and evaluation of the system.
- Replacing 40% of the septic tanks (60 tanks).
- Replacing 10% of the collection system (2,850 lf).
- Replacing the current recirculating distribution system for easier maintenance.
- Upgrade and repair deficiencies in the existing recirculation tank.
- Repair deficiencies in the existing splitter/dosing tank.

This cost estimate can vary substantially depending on the number of tanks or the length of the collection system that will need to be replaced.

Table 8-2: Alternative 2 - Preliminary Cost Estimate

ALTERNATIVE 2			
Fix existing system. Install upgrades for better performance/maintenance.			
	Unit Cost	**Units**	**Total Cost**
Septic Tanks			
Investigation	$180.00	151	$27,180.00
Replace 40% of Tanks	$5,450.00	60	$327,000.00
Tank Total:			$354,180.00
Collection Pipe			
Investigation		LS	$10,000.00
Replace 10% of the collection system	$38.50	2850	$109,725.00
Pipe Total:			$119,725.00
Recirculating Gravel Filter			
Replace RGF Distribution system		LS	$56,880.00
Add extra rock cover	$23.75	480	$11,400.00
RGF Total:			$68,280.00
Recirculation Tank			
Flow monitor (Clean/Calibrate or Replace)		LS	$9,810.00
Repair/Replace 3-way bypass valve		LS	$1,962.00
Add Blend/modulation tank with serviceable filters		LS	$14,715.00
Repair 90deg pump flange		LS	$2,561.50
Test solenoid valves in recirc tank		LS	$1,090.00
Add 6" drop down baffle on high water bypass		LS	$1,090.00
Upgrade Control Panel		LS	$0.00
Recirc Tank Total:			$31,228.50
Splitter/Dosing Tank			
Clean and adjust splitter weir		LS	$2,180.00
Repair/Re-prime Siphons in Dosing Tank		LS	$1,635.00
Splitter/Dosing Total:			$3,815.00
Construction Subtotal:			$577,228.50
10% Contingency:			$57,722.85
Alternative 2 Construction Estimated Cost:			**$634,951.35**
20% Engineering			$126,990.27
3% Administrative Costs:			$19,048.54
6% Permitting, Bonding, Misc:			$38,097.08
Alternative 2 Total Estimated Cost:			**$819,087**

This estimate also assumes that the current drainfield will continue to be permitted for use. If a replacement drainfield is needed, an additional cost of $178,000 dollars will need to be added to the estimate for a total cost of $997,000.

8.3.2.2 Operation and Maintenance Cost

O&M cost would be similar to the cost for Alternative 1. Costs are anticipated to slightly decrease due to new components that ease operation and maintenance; however, the same cost of $30,000/year for Alternative 2 will be used.

8.3.3 ALTERNATIVE 3 – LAGOON TREATMENT SYSTEM

8.3.3.1 Construction Cost

The preliminary cost estimate for construction, engineering, administration and permitting/bonding cost is estimated to be $1.5 million dollars.

This estimate includes:

- Investigating existing septic tanks and evaluation of tanks. (Does not include replacement cost of deficient tanks).
- Investigating existing collection system and evaluation of the system. (Does not include replacement cost of deficiencies in the collection system).
- Installation of pump station and force mains to transfer STEP/STEG sewage to lagoon system.
- Acquisition of land necessary for the lagoon system.
- Installation of disinfection system.
- Installation of new river outfall.

A detailed cost estimate of Alternative 3 (Preferred Alternative) is presented in Section 9.1.4.

8.3.3.2 Operation and Maintenance Cost

O&M costs associated with a new lagoon treatment system include, but is not limited to, costs operation of the new pump station, power and chemical costs associated with the disinfection system, and lagoon maintenance to control vegetation, insects and/or burrowing rodents.

It is estimated that annual O&M costs would be $25,000/year for Alternative 3.

8.3.4 ALTERNATIVE 4 – RGF WITH RIVER AND LAGOON DISCHARGE

8.3.4.1 Construction Cost

The preliminary cost estimate for construction, engineering, administration and permitting/bonding cost is estimated to be $1.8 million dollars.

This estimate includes:

- 43,750 gallons per day recirculating filter addition (AX MAX)
- Transmission line (4,300 LF)
- RGF distribution system upgrade and added gravel media
- Replacing the current recirculating distribution system for easier maintenance.
- Upgrade and repair deficiencies in the existing recirculation tank.
- Design and Construction of a new pump station.
- Transmission line from the pump station to the lagoon.
- Acquiring property/property rights.
- Lagoon Construction
- New UV system

Table 8-3: Alternative 4 - Preliminary Cost Estimate

ALTERNATIVE 4

Keep the RGF and add a lagoon and river discharge

	Unit Cost	Units	Total Cost
Added RGF capacity			
AX MAX	$429,460.00	1	$429,460.00
New UV System installed	$54,500.00	1	$54,500.00
Tank Total:			$483,960.00
Transmission Pipe			
Investigation		LS	$10,000.00
Replace 10% of the collection system	$38.50	4300	$165,550.00
Pipe Total:			$175,550.00
Recirculating Gravel Filter			
Replace RGF Distribution system		LS	$0.00
Add extra rock cover	$23.75	480	$11,400.00
RGF Total:			$11,400.00
Recirculation Tank			
Flow monitor (Clean/Calibrate or Replace)		LS	$9,810.00
Repair/Replace 3-way bypass valve		LS	$1,962.00
Add Blend/modulation tank with serviceable filters		LS	$14,715.00
Repair 90deg pump flange		LS	$2,561.50
Test solenoid valves in recirc tank		LS	$1,090.00
Add 6" drop down baffle on high water bypass		LS	$1,090.00
Upgrade Control Panel		LS	$0.00
Recirc Tank Total:			$31,228.50
Pump Station			
Pump Station		LS	$185,000.00
Lagoon		LS	$370,000.00
Pump Station/Lagoon Total:			$555,000.00
Construction Subtotal:			$1,257,138.50
10% Contingency:			$125,713.85
Alternative 4 Construction Estimated Cost:			**$1,382,852.35**
20% Engineering			$276,570.47
3% Administrative Costs:			$41,485.57
6% Permitting, Bonding, Misc:			$82,971.14
Alternative 4 Total Estimated Cost:			**$1,783,880**

8.3.4.2 Operation and Maintenance Cost

O&M cost would be similar to the cost for Alternative 2. Costs are anticipated to slightly decrease due to maintaining treatment components on two separate properties. A cost of $35,000/year for Alternative 4 will be used.

8.3.5 Fairoaks Pump Station Decommissioning

8.3.5.1 Construction Cost

The preliminary cost estimate for construction, engineering, administration and permitting/bonding cost is estimated to be $167,700 dollars.

This estimate includes:

- Installing approximately 1,350 linear feet of 4" PVC Pipe from the existing pump station running east along the southern edge of pavement of Fairoaks Street then running south along the westerly edge of pavement on Ellis Street and connecting to an existing cleanout.
- Removal of the existing Fairoaks Pump Station.

8.3.5.2 Operation and Maintenance Cost

Operational and maintenance cost are expected to be -$7,000/year because decommissioning the pump station removes costs associated with replacing pumps, routine maintenance and power consumption.

8.3.6 Summary of Costs

Table 8-4 below summarizes the estimated cost for each alternative. Costs were estimated using budgetary quotes from various contractors/suppliers and professional experience.

Table 8-4 Summary of Estimated Cost

	ALTERNATIVES				
	1	**2**	**3**	**4**	**Fairoaks PS Decommissioning**
Description of Work	Repair deficiencies in existing system	Repair deficiencies in existing system and install upgrades for easier maintenance	Treatment Lagoon	Repair deficiencies in existing system, add capacity and discharge to lagoon or river seasonally (does not include the irrigation system)	Decommissioning the Fairoaks Pump Station
Estimated Cost	$ 580,000*	$ 750,000*	$1,500,000	$1,780,000	$167,700
Estimated Annual O&M Cost	$30,000	$30,000	$25,000	$35,000	- $7,000

* This cost assumes that the current drainfield will continue to be permitted to use as-is. If a replacement drainfield is required an additional $178,000 dollars will be needed to be added to these estimates.

A detailed cost estimate was performed for Alternative 3 and the Fairoaks Pump Station Decommissioning because these options were selected as the preferred alternatives by the City. The detailed cost estimates for Alternative 3 and the Fairoaks Pump Station Decommissioning can be seen in section 9.1.4.

8.4 Recommended Rate Structure and Financing Strategy

The City cannot afford to build a new lagoon system, or any other system, without funding assistance. To understand financing strategy, it is important to understand potential funding sources. One such source is the Oregon Community Development Block Grant.

In order to qualify for an Oregon Community Development Block Grant (CDBG), the City must meet the threshold rate criteria. This requires that at construction completion of the proposed project, the City's sewer rate must be at or exceed 1.25% of the current median household income (MHI) as defined by the most recent American Community Survey 5-year estimate. Based on the 2007-2011 ACS, the MHI in Falls City is $41,528 making the threshold sewer rate $519.10 annually or $43.26 monthly. At this time (November 2013) the residential sewer rate is set at $46.00 per month.

8.4.1 Operation, Maintenance and Replacement (OMR)

Operation, Maintenance and capital long term system Replacement (OMR) costs represent an accounting method by which a system is sustainable through fees. The OMR presented in this report assumes that the present in-place value of sewer components is one half of the current construction cost value. This assumption was adopted because the existing 25-year-old sewer system has an expected life of 50 years. Components of the system that would remain in service within an alternative are included in the calculation for the present and future values of that alternative. For example, Alternative #3 will have a new value for the lagoons and new pump station along with the 1/2-life value of the collection system, because the collection system continues to be a part of the overall system.

Capital long term system replacement values were computed by determining the present value as described above. The present value was then projected to a 50-year future construction value at 3% annual interest. Then annuities (payments) were computed from the 50-year future construction value to determine the annual amount that would be required for future construction. The replacement cost annuities were then added to the estimated operation and maintenance (O&M) costs, as well as the City's budgeted overhead (OH) to result in a total annual cost for OMR. The OMR cost was then divided by 12-months per year and the number of connections to determine the fee estimate.

O&M costs for alternatives #1, #2, and #4 were taken from the City's sewer budget for 2012-2013. Budget items that appear to be directly related to sewer operations are included in the O&M section of Table 8-5 OMR Costs. All other items are included in "City Overhead Costs."

The adopted 2012-2013 budget shows total resources of $131,421 and total expenditures of $112,425 ($54,995 personnel and $57,430 materials and services). Line items that have been identified as directly attributable to sewer O&M sum to $41,500, leaving a balance of $70,925 attributable to overhead. For the purposes of this report, because total resources includes $35,921 in assets that are non-user fees, that value has been subtracted from the annual overhead cost resulting in a net of $35,000. The net overhead includes personnel costs.

Elimination of the Fairoaks Pump Station is expected to save $7,000 per year, resulting in projected O&M costs of $34,500.

Table 8-5: Summary of OMR Cost

	ALTERNATIVES			
	1	2	3	4
Adds Capacity?	NO	NO	YES	YES
Eliminates Drainfield?	NO	NO	YES	YES
Estimated Annual O&M Cost (OM)	$34,500	$34,500	$25,000	$34,500
City Overhead Costs (OH)	$35,000	$35,000	$35,000	$35,000
Estimated Present Worth of Alternative**	$1,651,420	$1,797,420	$2,530,200	$ 2,810,200
Estimated Annual Capital long-term system replacement (R)	$64,184*	$69,859*	$98,338*	$109,221
Estimated Annual OMR Cost + OH	$126,684	$139,359	$158,338	$178,721
Monthly OMR Cost per current Connection (179 Connections)***	$58.98	$64.88	$73.71	$83.20
Monthly OMR Cost per current EDUs (188 EDUs)	$56.15	$61.77	$70.19	$79.22
Monthly OMR Cost per future Connections (234 Connections)***	$45.12	$49.63	$56.39	$63.65
Monthly OMR Cost per future EDUs (243 EDUs)	$43.44	$47.79	$54.30	$61.29

* Assumed a 50 year design life span of the system and a 3% interest rate.

** Present worth includes current construction estimate plus the worth of existing facilities (i.e. collection system components, reused treatment components, and reused disposal components as applicable.)

*** Rates are based on connections rather than EDUs.

9 RECOMMENDED PLAN

9.1 INTRODUCTION

This Section is intended to summarize all of the recommendations in this Facilities Plan and provide clear and concise information on project selection, capacity needs, project prioritization, design parameters, project costs, and financing strategies. This Section shall outline the recommended plan for both the collection system and the wastewater treatment system.

9.1.1 PROJECT SELECTION

A new lagoon system is the preferred alternative (Alternative 3) because of ease of expansion for future connections, ease of maintenance and it would eliminate the most stressed aspects of the existing system. A treatment lagoon would allow abandoning the existing drainfield, RGF and UV Treatment which are difficult for the Public Works staff to maintain. A lagoon also makes it easier to manage large fluctuations in volumes caused by I/I by storing these volumes and then gradually discharging them at a constant rate. The lagoon alternative also allows for the option of STEP/STEG sewage reuse or irrigation.

Along with the lagoon alternative, work includes decommissioning the Fairoaks Pump Station. As stated in section 4.1.1.2.3.5, there are many problems associated with the Fairoaks Pump Station. Eliminating the pump station will reduce I/I occurring at the pump station, reduce maintenance costs and provide a more reliable means of transporting STEP/STEG sewage to the wastewater treatment plant.

9.1.2 PROJECT DESIGN FLOWS

Project design flows (26,000 gallons/day – 80,000 gallons/day) are directly related to I/I. For preliminary lagoon sizing purpose, an average dry-weather flow of 29,000 gallons/day was considered. Lagoon-sizing accounts for 67 inches of rain (precipitation) as well as sewer flows. $Peak_{20}$ (20-year design peak flows) of 100,000 gallons/day should be used for sizing pump station components.

Since the lagoon alternative was selected as the preferred alternative, the lagoon will be designed and sized for the average wet-weather flow of 41,000 gallons/day with an additional 13,000 gallons/day for future connections for a total daily flow of 54,000 gallons. The lagoon will also be sized with a surcharge volume to accommodate larger flow events such as the projected maximum monthly flow of 80,000 gallon/day.

9.1.3 DETAILED PROJECT DESCRIPTIONS AND DESIGN DATA

9.1.3.1 Lagoon

This alternative replaces the existing RGF and drainfield with a lagoon meant to store wastewater during the dry months until it can be discharged to the Little Luckiamute River during the wet-weather period. This project should be done in the 1-5 year timeframe. The lagoon(s) will require approximately 3 acres of land. Potential sites have been identified and will be described later in this section. This alternative requires the following major components:

- **Main Pump Station and Force main (Pressurized Pipe):** The collection system currently terminates at the existing WWTP. There is no space to locate the holding lagoon(s) at this site. In order to transfer the wastewater from the current site to the new lagoon site, it is proposed that the existing recirculation tank be retrofitted for use as a holding tank for a new pump station. The pump station will consist of a group of (3) pumps to transfer the wastewater to the lagoon(s). Along with the pump station, a new force main would need to be constructed to convey the wastewater from the existing site to the new lagoon site. The proposed force main route in Figure 9-1 conveys sewage along N. Main Street. While this is not the most direct route, it minimizes the required easements. The pump station and force main should be sized to handle proposed peak

instantaneous flows from the collection system. Consideration should be given for dry-weather flows to maximize pumping times and minimize fill times in the holding tank. This can be achieved by the installation of multiple pumps. Piping configuration should allow for the addition of pumps to meet future needs if expansion is ever considered.

- **Lagoons:** The new main pump station and force main will discharge wastewater to a new 2-cell earthen lagoon system. This system will consist of a facultative treatment lagoon and a larger secondary/storage lagoon. The facultative lagoon will provide secondary treatment of wastewater. This lagoon will rely on atmospheric re-aeration and algal respiration to generate sufficient dissolved oxygen levels within the upper layer of the lagoon so that no mechanical or diffused aeration system will be required. Sludge will accumulate on the bottom of the lagoon where anaerobic conditions exist and will require periodic removal. Water from the primary treatment lagoon will be discharged to a large secondary/holding lagoon where treated wastewater will be discharged directly to the river (after disinfection) during winter months or stored during dry months.

  Lagoons can be constructed in many shapes; however, they should be laid out to prevent short circuiting. Rectangular shapes would be recommended to prevent short circuiting and encourage plug flow. To prevent leaking of wastewater, the lagoons will need to be lined with an impermeable layer such as HDPE or other fabric. Each lagoon will need to be designed with dead storage capacity to ensure they do not dry up, as this could cause damage to the liner. In addition, the dead storage will allow for the accumulation of solids and avoid unwanted odor by exposing the sludge blanket. In general, facultative lagoons range from 4 to 8 feet in operational depth (this does not include free board or dead storage). This allows the lagoon to have both aerobic and anaerobic zones with a center mixing zone. Size and operation parameters for the two lagoons are:

  Facultative Treatment Lagoon: Sizing of facultative treatment lagoons are primarily based on organic loading. The average BOD loading of wastewater influent is approximately 25 lbs/day. Minimum surface area is based on a BOD loading rate of 35 lbs/day/acre for facultative lagoons. This results in minimum surface area requirement of 0.71 acres. The treatment lagoon should be operated in a continuous discharge mode allowing the discharge rate to fluctuate with the inflow. Effluent from the treatment lagoon will be discharged to the secondary holding lagoon.

  Storage Lagoon: To determine the storage lagoon size required, it was assumed all wastewater collected during the dry season (from May 1st to October 31st) would need to be stored. With an average dry season flow of 29,000 gpd, the estimated storage volume required is 5.3 million gallons. To minimize the acreage necessary for the holding lagoon, the storage depth of 8 feet is recommended which results in a total lagoon surface area of 2.0 acres. This storage volume could be reduced if wastewater is reused for spray irrigation. During winter months, the storage lagoon should be operated in a continuous discharge allowing the discharge rate to fluctuate with the inflow. It is recommended to keep the holding lagoon near full during the wet-weather season, this will maximize the hydraulic residence time. While primary treatment is not the goal of the lagoon(s) (primary treatment will continue to be provided by the existing septic tanks) the size of the lagoon(s) will provide the necessary size to meet typical residence time and loading criteria for treatment. It is anticipated the discharge from the lagoon(s) will exceed the quality provided by the primary treatment in the septic tanks.

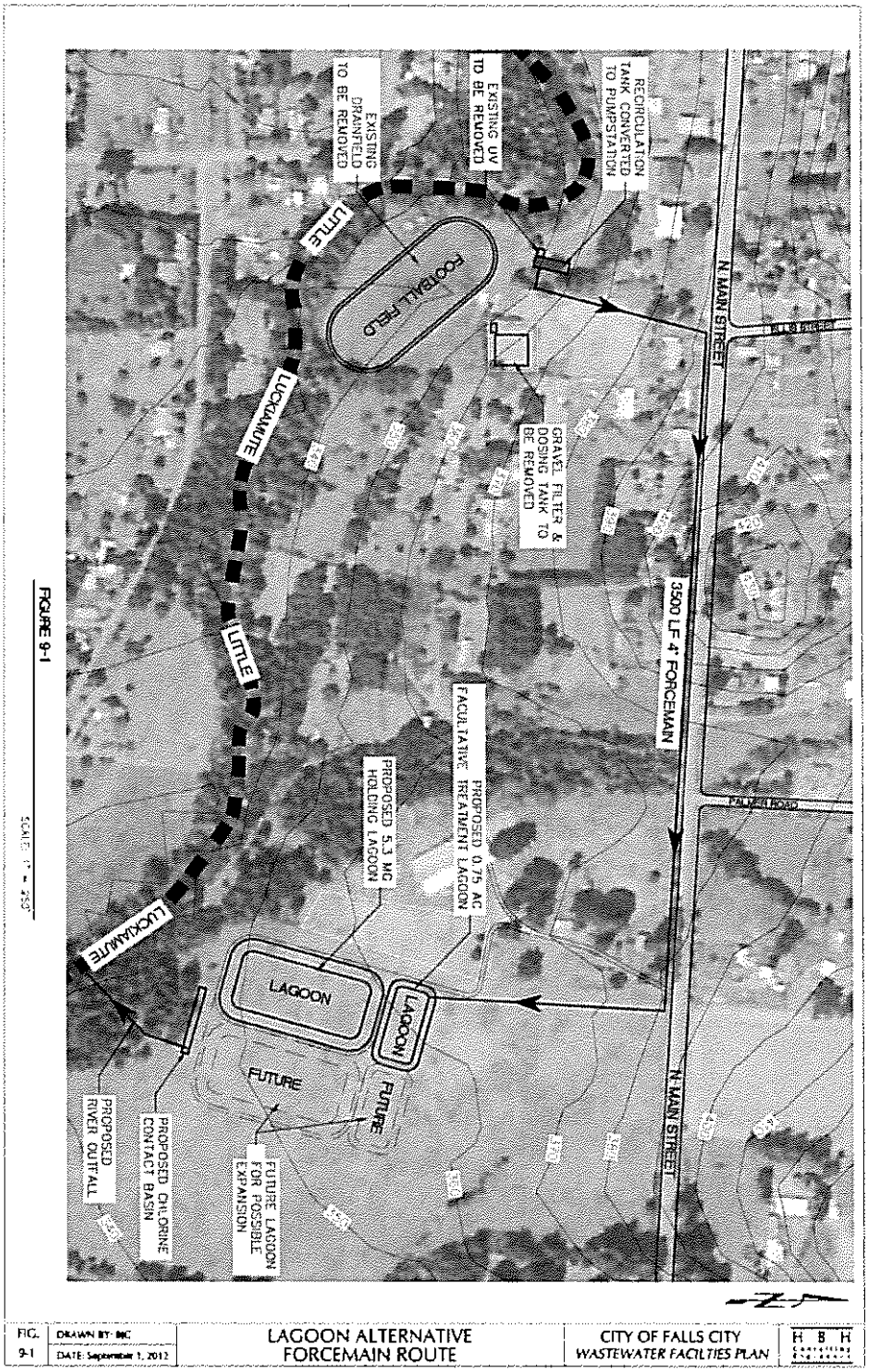


Figure 9-1 – Preliminary Plan for Lagoon Alternative

- **Sodium Hypochlorite Disinfection**: Prior to discharge, the wastewater will need to be disinfected. Due to the possibility of high algae concentrations, sodium hypochlorite or other chlorine solution will be needed to disinfect the effluent. A contact basin will need to be constructed to provide adequate contact time for proper disinfection. This can be an open baffled chamber, or underground pipe. After disinfection, the effluent will need to be dechlorinated with sodium bisulfite before being released to the Little Luckiamute River.
- **Solids Handling**: While the septic tanks will remove a large percentage of the solids, it is expected the lagoons will provide secondary sedimentation. Typical lagoons can provide 10-20 years of sludge accumulation, with the septic tanks these lagoons would be expected to last closer to the upper range if not longer.

9.1.3.2 Lagoon Sites

Two potential lagoon sites were identified as shown in Figure 9-2. The selection criteria included: proximity to existing wastewater treatment plant and to the river, property size, zoning and current use, and preliminary interest of the owners to have a lagoon on their property. An evaluation matrix, based on preliminary research, prioritizes the properties (see Table 9-1).

On December 5, 2012, letters were sent to the property owners to inform them of the City's planning efforts and to inquire as to their interest in having their property considered. All three property owners responded favorably and on December 19th a site visit was conducted.

Tax lot 300 (Tax Map 8-6-21): Site Address: 19240 Falls City Road, Dallas, is located on the west side of the lower cemetery and south of Falls City Road. The property, which is primarily used for pasture, is bordered on the north by Falls City Road and on the south by the Little Luckiamute River. The owner's representative, Patrick Carney, provided authorization to conduct a site visit but was not available to attend the site walk.

The southeast portion of tax lot 300 appears to be a good location for the lagoon system. The southeast area is not in the FEMA flood zone. It is away from existing development on this property and on adjacent properties, and is close to the river for treated effluent discharge.

Tax lot 1400: The preferred area (northwest portion) of tax lot 1400 (Tax Map 8-6-22) Site Address: 18955 Bridgeport Road, Dallas, is located adjacent to and east of the preferred area on tax lot 300. The owner, Bob Lamb, identified this portion of the property as being the only area on which he would consider the lagoon system. Mr. Lamb already has an irrigation system and is interested in using the treated effluent as an irrigation source. The proposed area is upland (not in the FEMA flood zone) and would require lagoon-discharge-pipe that could be diverted to the river or to the irrigation pump. The subject area appears to be used for hay production. The property does not have frontage on Falls City Road, so an easement for sewer transmission line and ingress/egress to the facility would be required.

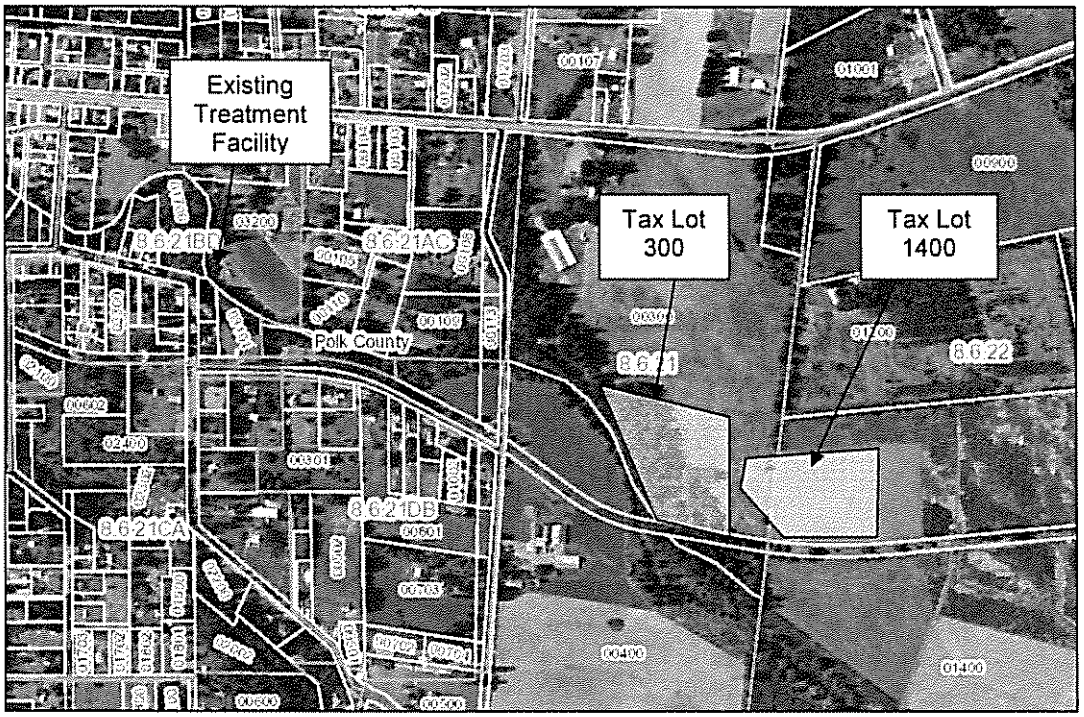


Figure 9-2: Preliminary Potential Lagoon Sites

Matrix Table 9-1 lists the criteria used to arrive at a preference given the preliminary information know about the three sites.

Table 9-1 – Matrix Evaluation of Preliminary Lagoon Site

	Tax Lot 300	Tax Lot 1400
Length of Piping to lagoon site (ft)	3850'	4450'
Site Conditions	Good, Upland	Good, Upland
Irrigation System Cost	Unknown, not discussed with owner's representative	Unknown, but outfall pipe to the existing system is desired by owner
Easement over third party property required?	NO	YES
Proportional RMV based on County Assessor Records (5 Acres)	$25K	$20K
Apparent Preference	**1**	**2**

9.1.3.3 Fairoaks Pump Station Decommissioning

The Fairoaks Pump Station reportedly was installed as a "temporary" facility to avoid easement issues during phase 1 of the City's sewage system construction. It has proven to be problematic on multiple occasions and is believed to contribute to the I/I problem as well as consuming maintenance resources. As a result, the City plans to replace the pump station with a gravity sewer line. This project should be done in the 1-5 year timeframe. The new line will be installed entirely within City right-of-way. Figure 9-3 shows the preliminary route and plan for decommissioning the pump station. This option requires the following major components:

- **Decommissioning Pump Station:** Removing and disposing of the existing pump station.
- **Collection System:** Installing approximately 1,350 linear feet of 4" PVC from the existing manhole located to the west of the Fairoaks Pump Station heading east along the south side of Fairoaks Street turning south along the west side of the Ellis street pavement and connecting to the existing 4" PVC line located approximately 200 feet north of the intersection with North Main Street.

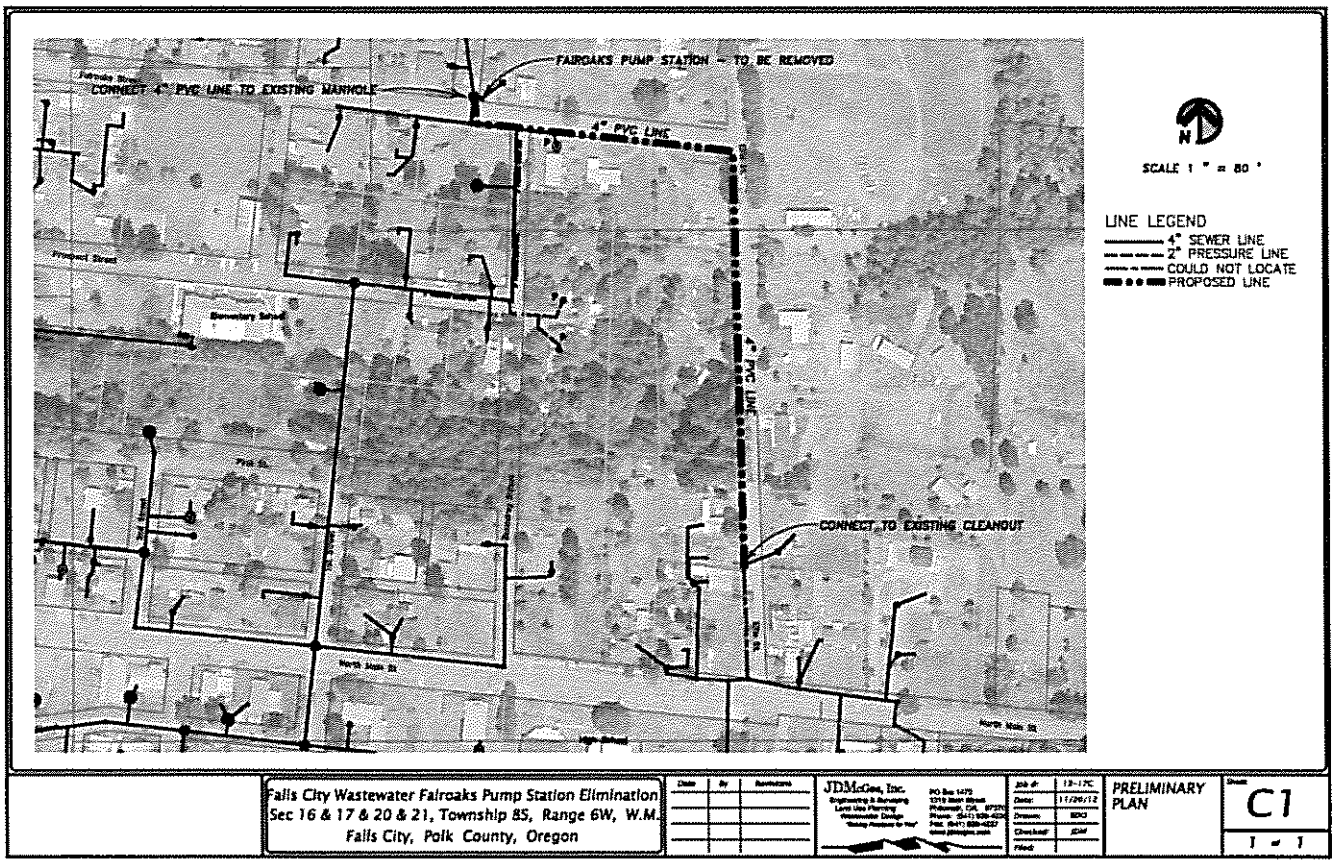


Figure 9-3 – Preliminary Fairoaks Pump Station Plan

9.1.3.4 Carey Ct. Pump Station

The Cary Ct. Pump Station needs a number of improvements to bring the pump station up to current industry and safety standards. Also the equipment such as the pumps and control panel will likely need

to be replaced during the planning period. Rather than rebuild the existing station it is recommended to replace the pump station with a small package pump station. This project should be done in the 1-5 year timeframe.

9.1.4 PROJECT COST SUMMARY

The estimated cost for the lagoon alternative is $1.5 million dollars with an annual operation and maintenance cost of $25,000 per year. The estimated cost for the Fairoaks Pump Station decommissioning is $167,700 with a reduction in annual operation and maintenance cost of $7,000 per year. The cost estimate for replacing the Carey Ct. Pump Station is $46,000 with no change in O&M. These costs include engineering, administration, and contingencies and are in 2015 dollars. An inflation rate of 3 percent was assumed. A detailed breakdown of this cost estimates for the lagoons and Fairoaks Pump Station decommissioning can be seen below.

Table 9-2 – Preliminary Engineers Estimate for Lagoon Alternative

H B H Consulting Engineers
2316 Portland Road, Suite H
Newberg, Oregon 97132
503/554-9553

ENGINEERS ESTIMATE

PROJECT: **CITY OF FALLS CITY - PRELIMINARY LAGOON ESTIMATE**

KEY NUMBER	KIND OF WORK	LENGTH	12/18/2013		
n/a	Public Sanitary Sewer				
ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL
PUMP STATION					
1	RETROFIT RECIRCULATION TANK	LS	1	$26,000	$26,000
2	90 GPM PUMPS (PIF 175 GPM)	EA	3	$9,750	$29,250
3	CONTROLS AND ELECTICAL	LS	1	$58,500	$58,500
4	PIPE, FITTINGS, VALVES, MISC	LS	1	$16,250	$16,250
5	TANK ACCESS, RAILS, MISC	LS	1	$6,500	$6,500
6	4-INCH FORCMAIN	LF	3,000	$35	$105,000
7	ON-SITE GENERATOR	LS	1	$39,000	$39,000
				SUBTOTAL	**$280,500**
LAGOON					
1	3-ACRE LAGOON EXCAVATION	CY	19,000	$7	$123,500
2	3-ACRE LAGOON EMBANKMENT	CY	15,000	$10	$150,000
3	HDPE LAGOON LINER	SF	185,000	$1	$185,000
4	FLOATING OUTLET	EA	1	$9,750	$9,750
5	FLOW METERING AND SAMPLING	LS	1	$16,250	$16,250
6	FENCING	LF	1,800	$7	$11,700
7	ELECTRICAL	LS	1	$50,000	$50,000
8	IN-STREAM OUTFALL	LS	1	$65,000	$65,000
9	PIPE, FITTINGS, VALVES, MISC	LS	1	$19,500	$19,500
10	LAND PURCHASE/LEASE	LS	1	$52,000	$52,000
				SUBTOTAL	**$682,700**
DISINFECTION					
1	CHLORINE TANKS, PUMPS, INJECTORS	LS	1	$16,250	$16,250
2	DECHLOR TANKS, PUMPS, INJECTORS	LS	1	$16,250	$16,250
3	CONTACT CHAMBER WITH BAFFLES	LS	1	$39,650	$39,650
4	ANALYZER AND MISC CONTROLS	LS	1	$5,850	$5,850
				SUBTOTAL	**$78,000**
				CONSTRUCTION TOTAL	**$1,041,200**
				MOBILIZATION	$62,500
				CONTIGENCY (10%)	$110,400
				SUBTOTAL	**$1,214,100**
				ENGINEERING (20%)	$242,800
				GRANT ADMINISTRATION, LABOR STANDARDS AND ENVIRONMENTAL REVIEW	$55,000
				PERMITING - DSL, COE, ECT. (2%)	$24,300
				TOTAL ESTIMATED COST (ROUNDED, 2015 DOLLARS)	**$1,536,000**

Table 9-3 below shows the preliminary engineers estimate for the Fairoaks Pump Station decommissioning. The table breaks down costs associated with administration, surveying, engineering and construction.

Table 9-3: Preliminary Engineers Estimate for Fairoaks Pump Station Decommissioning

JDMcGee, Inc.

PO Box 1472
Philomath, OR 97370
Ph: (541) 929-4226
Fax: (541) 929-4227

PRELIMINARY CONSTRUCTION COST ESTIMATE - FAIROAKS PUMP STATION DECOMMISSIONING

11-Dec-13

No.	ITEM	TYPE-SIZE-DESCRIPTION	QUANTITY	UNIT	UNIT COST	ITEM TOTAL
1	Preliminary Engineering (PE)					
1.A	*Project Administration*					
1.A.1	Grant Administrative Costs (Applys only if decomissioning work is seprate from lagoon work)		1	LS	10,000.00	10,000.00
1.B	*Design and Development*					
1.B.1	Surveying	Topographic survey & basemapping	1	LS	3,488.00	3,488.00
1.B.2	Engineering	Design drawings & Specifications	1	LS	6,540.00	6,540.00
1.B.3	Bidding	Bid doc.prep. & Bid processing	1	LS	5,014.00	5,014.00
1.C	*Environmental Process*		1	LS	1,090.00	1,090.00
1.D	*Coordination*					
	Project Management		1	LS	1,798.50	1,798.50
		Total PE				**$27,930.50**
2	Construction					
2.A	*Site Preparation*					
2.A.1	Mobilization	10% of Construction SubTOTAL	1	LS	8,821.00	8,821.00
2.A.2	Traffic Control	10% of Construction SubTOTAL	1	LS	8,821.00	8,821.00
2.B	*Pipe Installation*					
2.B.1	Install 4" PVC Effluent Pipe		1350	LF	50.00	67,500.00
2.B.2	Connect to existing		1	LS	4,360.00	4,360.00
2.B.3	Remove and Replace Asphalt		1	LS	5,450.00	5,450.00
2.B.4	Remove existing PS		1	LS	10,900.00	10,900.00
		SubTOTAL Construction Est.				**88,210.00**
		TOTAL Construction Estimate				**105,852.00**
2.D	*Contingency*	10% of Construction Estimate	1	LS	10,585.20	10,585.20
		Construction Estimate plus Contingency				**116,437.20**
2.E	*Construction Engineering*	20% of Const. plus Contingency	1	LS	23,287.44	23,287.44
		Total CONST (2015 dollars)				**$139,724.64**

TOTAL COST: PE + CONST	**$167,655**

Table 9-4 below shows the preliminary engineers estimate for the combined project. The table consolidates costs associated with administration, surveying, engineering and construction.

Table 9-4: Combined Preliminary Engineers Estimate (Lagoons and Fairoaks Pump Station Decommissioning.

ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL
PUMP STATION					
1	RETROFIT RECIRCULATION TANK	LS	1	$26,000	$26,000
2	90 GPM PUMPS (PIF 175 GPM)	EA	3	$9,750	$29,250
3	CONTROLS AND ELECTICAL	LS	1	$58,500	$58,500
4	PIPE, FITTINGS, VALVES, MISC	LS	1	$16,250	$16,250
5	TANK ACCESS, RAILS, MISC	LS	1	$6,500	$6,500
6	4-INCH FORCMAIN	LF	3,000	$35	$105,000
7	ON-SITE GENERATOR	LS	1	$39,000	$39,000
				SUBTOTAL	$280,500
LAGOON					
1	3-ACRE LAGOON EXCAVATION	CY	19,000	$7	$123,500
2	3-ACRE LAGOON EMBANKMENT	CY	15,000	$10	$150,000
3	HDPE LAGOON LINER	SF	185,000	$1	$185,000
4	FLOATING OUTLET	EA	1	$9,750	$9,750
5	FLOW METERING AND SAMPLING	LS	1	$16,250	$16,250
6	FENCING	LF	1,800	$7	$11,700
7	ELECTRICAL	LS	1	$50,000	$50,000
8	IN-STREAM OUTFALL	LS	1	$65,000	$65,000
9	PIPE, FITTINGS, VALVES, MISC	LS	1	$19,500	$19,500
10	LAND PURCHASE/LEASE	LS	1	$52,000	$52,000
				SUBTOTAL	$682,700
DISINFECTION					
1	CHLORINE TANKS, PUMPS, INJECTORS	LS	1	$16,250	$16,250
2	DECHLOR TANKS, PUMPS, INJECTORS	LS	1	$16,250	$16,250
3	CONTACT CHAMBER WITH BAFFLES	LS	1	$39,650	$39,650
4	ANALYZER AND MISC CONTROLS	LS	1	$5,850	$5,850
				SUBTOTAL	$78,000
FAIROAKS PUMP STATION DECOMISSIONING					
1	TRAFFIC CONTROL	LS	1	$8,800	$8,800
2	INSTALL 4" PVC EFFLUENT PIPE	LF	1,350	$50	$67,500
3	CONNECT TO EXISTING	LS	1	$4,400	$4,400
4	REMOVE AND REPLACE ASPHALT	LS	1	$5,450	$5,450
5	REMOVE EXIST. PUMP STATION	LS	1	$10,900	$10,900
				SUBTOTAL	$97,050
CAREY PUMP STATION REPLACEMENT					
1	REPLACE PUMP STATION	LS	1	$35,000	$35,000
				SUBTOTAL	$35,000
				CONSTRUCTION TOTAL	**$1,173,250**
				MOBILIZATION	$71,300
				CONTIGENCY (10%)	$124,500
				SUBTOTAL	**$1,369,050**
				ENGINEERING (20%)	$291,800
				GRANT ADMINISTRATION, LABOR STANDARDS AND ENVIRONMENTAL REVIEW	$65,000
				PERMITING - DSL, COE, ECT.	$24,300
				TOTAL ESTIMATED COST (ROUNDED, 2015 DOLLARS)	**$1,750,000**

9.1.5 List of Short Lived Assets

If Rural Development (RD) monies are available, a short lived assets table will be furnished in this section.

9.2 Financing Strategy

A financing strategy or plan must provide a mechanism to generate capital funds in sufficient amounts to pay for the proposed improvements over the relatively short duration in design and construction. The financing strategy must also identify the manner in which annual revenue will be generated to cover the expense for long-term debt repayment and the on-going operation and maintenance of the system.

The objectives of a financial strategy include the following:

- Identify the capital improvement cost for the project and the estimated expenses for operation and maintenance.
- Evaluate potential funding sources and select the most favorable program.
- Identify the local cost share based on the amount of outside funding obtained.
- Determine the cost to system users to finance the local share and the annual cost for operation and maintenance.

Section 8 of this facilities plan outlines a number of financing options that are available to the City for financing the recommended improvements. The financing options include local funding sources, state and federal loan and grant programs, tax programs, and others. While the final financing package that the City will ultimately utilize depends on the results of coordination with the various funding agencies, this section will summarize the general direction the City should proceed with and provide some insight into the potential impacts to rate payers.

9.2.1 Existing Debt Service

No existing debt service has been reported by the City.

9.2.2 Project Expenses

This wastewater facilities plan outlines a plan for all necessary improvements and represents a significant investment for the City in new wastewater treatment facilities. Improvement projects recommended in this facilities plan totals more than $1.75 million dollars (see Table 9-4).

9.2.3 Financing Strategy

The City should proceed with the following steps as they move forward with the financing strategy for the wastewater improvement projects:

I. As soon as the City receives approval for the completed *Falls City Wastewater Facilities Plan*, the City should contact OECDD and DEQ to schedule a one-stop meeting. At a one-stop meeting, all of the potential funding agencies meet with the City to discuss the project and identify possible funding scenarios. The agencies will, in real time, make recommendations and will discuss what each agency can offer. The result will be a potential funding package made up of grants and loans from a number of agencies to fund the project.

II. Following the one-stop meeting, the City should immediately process the necessary paperwork to apply for the funding included in the funding package recommended at the one-stop meeting. This will require numerous applications and other administrative efforts to apply for funding. The City should apply to any and all programs or agencies that have the potential to provide grant money to reduce the impact to rate payers. The City should also notify the public of potential impacts to the current sewer user fees.

III. Once the City receives notification that they have secured the necessary funding to complete the work, they can begin the pre-design and design activities in preparation for bidding and construction of the improvements. At this time the City should notify the public of the new sewer user fee.

It is recommended that the City apply for as many sources of funding as possible in order to maximize their chances of receiving grant funds and minimizing the financial burden placed on rate payers.

9.2.4 Impact to Rate Payers

The funding package for the recommended project may include a loan component that will necessitate a rate increase for the average rate payer. While the final funding package will not be known until after the one-stop meeting and not confirmed until the City receives notice that they have secured the necessary funding, it is important that the City be provided with some insight on the potential impact to rate payers so that they may begin educating the public and develop plans for increasing rates as needed to pay for the significant costs associated with these improvements.

For the purpose of this exercise, it was assumed that loans would be available from Clean Water State Revolving Fund (CWSRF) administered by DEQ. As of February 2013, the interest rate for a CWSRF loan is 1.43% APR. Table 9-5 shows the potential impact to rate payers for different grant percentages for all Priority 1 project costs.

Table 9-5: Potential Impact to Rate Payers

	Grant Received				
	0%	25%	50%	75%	100%
Total Project Amount	$1,750,000	$1,750,000	$1,750,000	$1,750,000	$1,750,000
Grant Received	$0	$437,500	$875,000	$1,312,500	$1,750,000
Total Loan Required	$1,750,000	$1,312,500	$875,000	$437,500	$0
Monthly Debt Serve*	$8,436	$6,327	$4,218	$2,109	$0
Required Rate Increase (per 179 Current Service Connections)	$47.13	$35.34	$23.56	$11.78	$0.00
Required Rate Increase (per 188 Current EDUs)	$44.87	$33.65	$22.44	$11.22	$0.00
Current Rate (per Service Connection)	$46.00	$46.00	$46.00	$46.00	$46.00
New Rate (per 179 Current Service Connection)	$93.13	$81.34	$69.56	$57.78	$46.00
New Rate (per 188 Current EDUs)	$90.87	$79.65	$68.44	$57.22	$46.00

*Based on current interest rate from CWSRF of 1.43% and a 20 year term for loan

As mentioned before, the final impact to rate payers will not be known until the final funding package is confirmed and all variables are set. Should interest rates rise significantly before the funding package is secured, the impact to rate payers will be greater. The City should begin in earnest in educating the

public, developing a rate increase plan, and pursuing grant and loan monies. If the project is funded entirely with a loan, the per EDU rate for loan and estimated OMR cost would be $93.13 per month.

9.3 IMPLEMENTATION SCHEDULE

The following implementation schedule suggests a fast-track approach to the preferred alternate construction project. The task list is expected to remain consistent, while the timeline may vary due to approvals and City's preferences.

Milestone or Implementation Step	Date (if applicable)
Complete facilities planning	January 2014
DEQ Review complete and approval of Facilities Plan (estimated)	April 2014
Schedule One-Stop Meeting	April 2014
Begin funding acquisition process	May 2014
Complete funding applications	June 2014
Obtain final funding package	October 2014
Begin predesign activities for projects	November 2014
Begin Environmental Review Process	November 2014
Submit predesign report to DEQ for approval	February 2015
Begin design phase of projects	March 2015
Complete design of projects/submit for DEQ approval	Winter 2014-15
Complete Environmental Review Process	April 2015
Address DEQ comments and complete final construction documents	June 2015
Advertise for bids for construction projects	July 2015
Begin construction of projects	August 2015

9.4 RECOMMENDED PROJECT SUMMARY

Table 9-6 summarizes the recommended projects outlined in this Plan.

Table 9-6 Capital Improvement Project Summary

Project No.	Description	Feet of Pipe	Construction Cost	Engineer, Legal & Admin. Cost	Contingency	Total Cost (rounded)	Time Line
CIP-A	Build 3-Acre Lagoon/Holding Pond, Influent Pump Station and Forcemain, and Disinfection Facility.	-	$1,103,700	$322,100	$110,400	$1,536,000	1- 5 yr
M-1	Decommission Fairoaks Pump Station and Replace with Gravity Sewer.	1,350'	$106,000	$51,000	$11,000	$168,000	1- 5 yr
M-2	Replace Carey Ct. Pump Station.	-	$35,000	$7,000	$3,500	$46,000	1- 5 yr
Total			**$1,244,700**	**$380,100**	**$124,900**	**$1,750,000**	

CIP-Capital Improvement Project
M - Maintenance Project

10 ENVIRONMENTAL REVIEW

10.1 INTRODUCTION

This section is intended to provide a preliminary description of environmental concerns associated with the recommended improvement plan. This preliminary environmental review will discuss the foreseeable impacts associated with each alternative project, including the "no-action" option, preferred alternative and alternative options. Once the City has scheduled a one-stop meeting and determine which funding agency would be utilized to fund the sewer projects, a more in-depth environmental review may be required depending on the funding agency.

The location and site description of each project can be found in Section 5 of this facilities plan. The description, purpose and need for each project are discussed in Section 7. The details of each option, including the "no-action" option are also discussed in Section 7 of this Plan. Information regarding the physical environment within the study area can be found in Section 3 of this Plan.

10.2 PURPOSE & NEED

10.2.1 PROJECT DESCRIPTION (PREFERRED ALTERNATIVE)

The proposed projects include decommissioning of the City's Fairoaks Pump Station and construction of a new lagoon system. A new gravity pipeline will be installed to bypass the Fairoaks Pump Station. The new lagoon system will consist of two earthen lagoons that will provide secondary treatment and dry-weather storage of wastewater. As part of the new lagoon system, a new main pump station will be installed to pump wastewater from the existing treatment plant site to a new, yet to be determined, site for the lagoon system through approximately 3,000 feet of new force main. In addition, a new chlorine disinfection facility, contact basin, dechlorination equipment, river outfall, and miscellaneous piping would be constructed.

10.2.2 PURPOSE & NEED FOR PROJECT

The City of Falls City's wastewater system includes a collection system, pump station, recirculating gravel filters (RGF), and drainfield. The collection system consists of a Septic Tank Effluent Gravity (STEG) system with some sections that are Septic Tank Effluent Pressure (STEP). The system was originally constructed in 1986.

The existing system has a number of observed deficiencies, including (but not limited to):

- High volume of I/I in collection system.
- The Fairoaks Pump Station is in poor condition and a significant source of I/I to the system.
- During wet-weather the actual flows have been recorded at almost double the RGF capacity.
- The treatment facility components are in poor condition and require frequent repairs.
- The drainfield, located under the High School football field, is overworked. Overloads of the treatment system results in suspected sewage surfacing onto the football field.

The proposed project will reduce the amount of I/I in the system by decommissioning the Fairoaks Pump Station. Additionally, the existing treatment facility will be abandoned and replaced by a lagoon system, providing the system with lower O&M costs, more flexibility, produce higher quality wastewater effluent and larger capacity to handle high variability in wastewater flows and loading.

10.2.3 Alternatives to Proposed Project

10.2.1.1 No Action Scenario

One alternative to the proposed action is to do nothing. The Fairoaks Pump Station would not be decommissioned and a new lagoon system would not be built. Excess inflow and infiltration would continue to overload the treatment facility during wet weather potentially resulting is wastewater surfacing in the High School football field.

10.2.1.2 Decommission Fairoaks Pump Station

Fairoaks Pump Station reportedly was installed as a "temporary" facility to avoid easement issues during phase 1 of the City's sewage system construction. It has proven to be problematic on multiple occasions and is believed to contribute significantly to the I/I problem as well as consuming maintenance resources. The recommended alternative is to remove the Fairoaks Pump Station by installing a gravity line down the right-of-way on Fairoaks Street and Ellis Street. The new line will be installed entirely within City right-of-way. In addition to removing and disposing of the existing pump station, this alternative would include installing approximately 1,350 linear feet of 4" PVC from the existing manhole located to the west of the Fairoaks Pump Station heading east along the south side of Fairoaks Street turning south along the west side of the Ellis Street pavement and connecting to the existing 4" PVC line located approximately 200 feet north of the intersection with North Main Street.

10.2.1.3 New Treatment Facility

A number of treatment facility options were evaluated including:

- **Repair collection System** – This alternative would continue use the existing treatment facility but make a focused, well-defined effort to reduce I/I in the collection system and implement a rigid management and maintenance plan. This alternative will help reduce the flows to a more manageable volume; however, it is uncertain how long the existing treatment system will continue to treat the STEP/STEG sewage in a satisfactory manner.
- **Upgrade existing system** - This alternative includes fixing the existing collection system to eliminate portions of I/I and installing upgrades to the existing treatment system to increase performance and to make maintenance more user-friendly.
- **Use existing RGF and incorporate river and lagoon discharge** – This alternative would also continue use of the existing facility but route the final discharge of treated effluent to the river in winter months or to a lagoon in summer months abandoning the existing drainfield. Note that the following environmental review does not specifically look at the impact of this alternative, rather it is assumed that potential impacts will be similar to those associated with upgrading the RGF system (see above alternative) and constructing a new lagoon system (see preferred alternative below).
- **Construct new treatment and holding lagoon system (preferred alternative)** - The preferred alternative of this *Wastewater Facility Plan* is to install a new 2-cell earthen lagoon system to provide secondary treatment and dry-weather holding capacity for wastewater. Due to site restrictions at the existing WWTP, locating a lagoon system would require the City of Falls City to redirect the wastewater stream to a new suitable location. In addition to the lagoons and pump station, this alternative would require a new chlorine disinfection facility, contact basin, dechlorination equipment and river outfall. Since a specific site for the new lagoon system has not yet been determined, this environmental review will provide general discussion of potential impacts due to the new lagoon system. A more detailed analysis of environmental impacts can be prepared once final site selection has been made.

10.3 Land Use/Important Farmland/Formally Classified Land

10.3.1 Environmental Consequences

No-Action. No agricultural lands would be impacted by the "no-action" alternative.

Fairoaks Pump Station Decommissioning. The Fairoaks Pump Station is located on Fairoaks Street within the city limits of Falls City. All of the area within the project site for pump station decommissioning is within the City's existing right-of-way in areas that are currently paved or previously disturbed. There is no impact to agricultural land associated with this project.

Repair Existing Collection System. The City's collection system lies entirely within the Falls City urban growth boundary (UGB). All work associated with this alternative would be in areas of previously disturbed land. There is no impact to agricultural land associated with this project.

Upgrade RGF. The City's existing treatment facility is located south of Falls City High School. All work associated with this alternative would be in areas of previously disturbed land. There is no impact to agricultural land associated with this project.

New Lagoon System. At this time it is unknown where the new lagoon system will be located. Two potential lagoon sites were identified in Section 9.1.4.1. Both properties are located outside of the Falls City limit and in lands currently used for agriculture.

- **Tax lot 300:** Located on the west side of the lower cemetery and south of Falls City Road. The property, which is primarily used for pasture, is bordered on the north by Falls City Road and on the south by the Little Luckiamute River.
- **Tax lot 1400:** The preferred area (northwest portion) is located adjacent to and east of the preferred area on tax lot 300. The subject area appears to be used for hay production. The property does not have frontage on Falls City Road, so an easement for sewer transmission line and ingress/egress to the facility would be required.

The sites currently offered as potential location for the new lagoon system are in areas currently in agricultural production. Constructing the proposed lagoon system would remove a minimum of three acres from future agricultural use.

10.3.2 Mitigation

Loss of agricultural land is permitted and justified by the necessity to improve public utility facilities for public health and safety. Furthermore, all of the proposed sites for the new lagoon treatment system are contingent upon the land owner being able to use wastewater from the secondary/holding lagoon for spray irrigation. This would off-set some of the negative impact of lost agricultural lands. Long-term impacts to agricultural lands from the proposed project should occur in accordance with Falls City and Polk County Comprehensive Plans and implementing regulations developed pursuant to the Statewide Land Use Planning Goals.

10.4 Floodplains

Information from the City Zoning Map and Flood Insurance Rate Maps (FIRM) were used to evaluate the plan's effect on the floodplains. See Section 3.2.3.1 for additional details on flood hazards within the City.

10.4.1 Environmental Consequences

No-Action. Some portions of the wastewater system would be affected in a 100-year flood event. Areas affected may include residences on South Main Street and Dayton Street, as well as, significant flooding occurring at the existing treatment plant and drainfield. The "no-action" alternative would not reduce I/I in the system and it would keep the existing treatment facility and drainfield within the 100-year flood zone.

As a result, high wet-weather flows could overwhelm various parts of the wastewater system and pose a serious risk to public and environmental health.

Fairoaks Pump Station Decommissioning. The new gravity pipeline will not be constructed within a floodplain. Therefore, no environmental consequence related to the project is expected.

Repair Collection System. This alternative would reduce the amount of I/I entering the system and reduce the risk of potential overflows occurring in low lying elevations. However, this alternative would make no improvements to the treatment or drainfield facilities which currently flood during large rain events.

Upgrade RGF. The existing treatment plant and drainfield are within the area affected in a 100 year flood event. Public Works reported that the 1996 flood event submerged the recirculation tank portion of the wastewater treatment facility. Portions of the treatment facility are located within the 100-year floodplain. This puts the facility at risk of damage during large storm events. There is also a significant risk that flooding and increased I/I may result in failure of the recirculation tank, RGF, or drainfield due to overloading. This would pose a serious risk to human health.

New Lagoons System. Of the three potential sites for a lagoon system, the portion of land that would be used on tax lot 400 is partially within the 100-year floodplain. The other two lots are upland and out of the floodplain. Should the City decide to locate a new lagoon system at tax lot 400, there is a risk that the system could be affected by flooding. Construction within floodplains can reduce floodplain capacities which can lead to additional damaging flooding in other areas. There is also an increased risk that the lagoons could overflow and potentially violate its discharge requirements to the Little Luckiamute River or surrounding farmland.

10.4.2 Mitigation

Mitigation measures for floodplains include the following:

- Provide at least 2 ft of freeboard at the top of any lagoon.
- Lagoons should be lined with an impermeable layer such as HDPE or other fabric seepage.
- Any manholes within the floodplain should have watertight, bolt down lids.
- A US Army Corp of Engineers permit may be required for impacts to the floodplain.

10.5 Wetlands

Two areas identified as wetlands are within the footprint of the Falls City wastewater system (source Comprehensive Plan Map by COG). These areas are in the vicinity of Fairoaks Street and Bryant Street near Wood Street and areas between 5th Street and 6th Street west of Bryant Street. This area lies outside of all of the proposed projects.

10.5.1 Environmental Consequences

None of the proposed projects appear to pose a short- or long-term risk to wetlands. However, once the City makes a final selection of site for the new lagoon system it is advisable to contact the Department of State Lands (DSL). The agency may require the City to hire a wetland consultant to delineate the project area and submit the delineation report to DSL for review and concurrence. Impacts to wetlands should be avoided, however, DSL and US Army Corp of Engineer permits may be required if impacts cannot be avoided.

10.5.2 Mitigation

Mitigation measures for wetlands include the following:

- A wetland delineation should be performed to determine if wetlands will be impacted by the project.

- Impacts to wetland should be avoided by the project. If impacts cannot be avoided than DSL and/or US Army Corp of Engineer permits may be required.

10.6 Cultural Resources

There are no known cultural resources that would be affected as part of the proposed project or the treatment alternatives. However, the State Historic Preservation Office (SHPO) should be contacted regarding the project and cultural resources. Additionally, local Native American tribes are given the opportunity to comment on the project that may be within their Ancestral Territory and whether the project would impact cultural resources.

10.6.1 Environmental Consequences

No-Action. This alternative would have no impact on cultural resources.

Fairoaks Pump Station Decommissioning. The new gravity bypass line will be located within road right-of-ways and in areas that have previously been disturbed. It is unlikely that this would impact any cultural resources.

Repair Collection System. The majority of improvements would be within road right-of-ways or in areas that have previously been disturbed. It is unlikely that this would impact any cultural resources.

Upgrade RGF. Any upgrades to the existing treatment facility would be in areas that have previously been disturbed. It is unlikely that this would impact any cultural resources.

New Lagoons System. The new lagoon system will require extensive excavation in areas that have previously been undisturbed. This in combination with the fact the lagoons will be situated adjacent to the Little Luckiamute River may pose a greater risk to impacting unknown cultural resources. In the event that unknown archaeological/cultural resources are unearthed during construction, all activity should cease and an archeologist along with the appropriate tribal representatives should be contacted to assess the potential discovery. Any further work would continue only under the authorization and supervision of the State Historic Preservation Officer and the appropriate tribal representative.

10.6.2 Mitigation

Mitigation measures for cultural resources include the following:

- During construction activities, if any cultural material is discovered, work should immediately cease until a professional archaeologist can assess the discovery.
- A cultural review and survey may be needed prior to final design and construction. Once the actual project is selected by the City, the area for the possible cultural review and survey could be narrowed down.

10.7 Biological Resources

There are a number of agencies that should be consulted to determine the existence of endangered, threatened or sensitive species in project vicinity including: NOAA National Marine Fisheries Service (NMFS), Oregon Department of Agriculture (Native Plant Conservation Program), Oregon Department of Fish and Wildlife, and US Fish and Wildlife Service (USFWS) Oregon State Office.

10.7.1 Environmental Consequences

No-Action. There is likely to be very few short-term consequences of the "no-action" alternative. However, continued degradation of the existing treatment facility and drainfield may result in poor quality effluent being released into the Little Luckiamute River which could impair fish or other aquatic animals.

Fairoaks Pump Station Decommissioning. The new gravity bypass line will be located within road right-of-ways and in areas that have previously been disturbed. It is unlikely that this would have long-term impact on biological resources. However, noise, construction runoff, etc. may have minor short-term impacts to plants and animals.

Repair Collection System. The majority of the work associated with this alternative would be conducted in existing road right-of-ways or in previously disturbed areas where there are few biological resources. There may be short term consequences, such as noise, construction runoff, etc. There may also be long-term consequences if I/I reduction is not sufficient and overwhelms the treatment or drainfields and negatively impacts fish or other aquatic animals.

Upgrade RGF. Any upgrades to the existing treatment facility would be in areas that have previously been disturbed. It is unlikely that this would have long-term impact on biological resources. However, noise, construction runoff, etc. may have short-term impacts.

New Lagoons System. Construction of the lagoon system may have short-term and long-term impacts on biological resources in the area. Not of all of the potential impacts will be negative. Although there is risk of loss of habitat due to construction, the lagoons may also provide new habitat to water fowl. The berms of the lagoons may also attract burrowing animals which would need to be removed in order to ensure the integrity of the structure. Additionally, the lagoon system will improve the wastewater effluent quality and reduce potential impairment to the Little Luckiamute River during winter discharge. In order to minimize short-term impacts of construction, proper erosion control practices will need to be implemented to prevent sediment runoff into Little Luckiamute River during construction. In addition, installation of the new river outfall will need to occur during allowable water work periods. Adverse impacts to state-listed threatened or endangered plant species need to be avoided by the project. A plant survey for state-listed threatened or endangered plant species may be needed to ensure that these species are not adversely impacted by the project. Adverse impacts to other listed threatened or endangered species also need to be avoided by the project. A biological evaluation or assessment may be required to ensure that listed threatened or endangered species are not adversely impacted by the project.

10.7.2 Mitigation

Mitigation measures for biological resources include the following:

- A survey for listed threatened or endangered plants may be required for the project.
- A biological evaluation or assessment may be required for the project.
- The project will need to implement the proper erosion control practices to prevent sediment runoff into the Little Luckiamute River during construction.
- Construction of the new river outfall in the Little Luckiamute River will need to occur during allowable water work periods.
- Vegetation removed within 50 ft of the lowest tree-lined or shrub-lined bank during construction will need to be replaced with suitable replacement vegetation.

10.8 Water Quality Issues

10.8.2 Affected Environment

The primary water body potentially impacted by proposed projects and treatment alternatives is the Little Luckiamute River which splits the city. The Little Luckiamute River is permitted to receive up to 26,250 gallons/day of treated wastewater during the wet-weather months under the current NPDES permit.

There are no federally designated wild and scenic rivers regulated by the Omnibus Oregon Wild and Scenic Rivers act of 1988, or state-designated scenic waterways regulated by the Oregon Scenic Waterways Act of 1968 located within any of the proposed projects' vicinities.

No state-designated sole source aquifers or groundwater recharge areas are located on or near the proposed or alternative projects.

10.8.3 Environmental Consequences

Since there is not a Wild or Scenic River, none of the projects or alternatives pose a risk to Wild or Scenic Rivers. Additionally, none of the proposed projects or alternatives risks impacting sole source aquifers.

No-Action. There is likely to be very few short-term consequences of the "no-action" alternative. However, continued degradation of the existing treatment facility, drainfield, and collection system may result in overflows or poor quality effluent being released into the Little Luckiamute River which could impair water quality. Additionally, the overworked drainfield could also impair groundwater quality.

Fairoaks Pump Station Decommissioning. Short and long term impacts on groundwater quality include releases of hazardous materials (gasoline, solvents, etc.) during construction that could infiltrate the groundwater. The City will be responsible to ensure any spilled hazardous material will be contained.

Repair Collection System. There may be short term consequences, such construction runoff, potential for hazardous spills, etc. There may also be long-term consequences if I/I reduction is not sufficient and overwhelms the treatment or drainfields and impair the quality of Little Luckiamute River. Effluent drainfield disposal could result in localized infiltration of nutrients (nitrates in particular) and very minor amounts of metals into groundwater resources.

Upgrade RGF. Soil-disturbing construction activities associated with this alternative could temporarily affect surface water quality in the construction areas with the end result an increase in silt discharge to the Little Luckiamute River. In addition, hazardous materials such as gasoline from storage or refilling areas, solvents, and lubricants from construction equipment could potentially make their way to surface waters or infiltrate into groundwater. Effluent drainfield disposal could result in localized infiltration of nutrients (nitrates in particular) and very minor amounts of metals into groundwater resources.

New Lagoons System. Overall the proposed treatment lagoon system will have a positive long-term impact by improving the quality of wastewater effluent discharged to the Little Luckiamute River. Soil-disturbing construction activities associated with construction of the preferred alternative could temporarily affect surface water quality in the construction areas with the end result an increase in silt discharge to the Little Luckiamute River. In particular, construction of the new outfall will need to be done so to minimize impact to the river. In addition, hazardous materials such as gasoline from storage or refilling areas, solvents, and lubricants from construction equipment could potentially make their way to surface waters or infiltrate into groundwater. Proper erosion control practices will need to be implemented to prevent sediment runoff into Little Luckiamute River during construction.

10.8.4 Mitigation

Mitigation measures for water quality issues include the following:

- A 1200C general NPDES permit will need to be obtained for water quality for the construction site.
- Existing components of the treatment plant will need to be kept on-line until new components can be brought on-line to ensure the WWTP's NPDES permit requirements are met during construction.
- Water used to mitigate for dust created during construction activities shall be prevented from entering drainages and must be collected and disposed of in accordance with DEQ water quality standards and NPDES permit requirements.
- To reduce the possibility of chemical spills or releases of contaminants, including any non-stormwater discharge to drainage channels, the contractor shall implement appropriate hazardous materials management practices.

- When bypass pumping of sewage is required, the contractor shall have multiple pumps on hand to ensure sewage spills and overflows do not occur.

10.9 Socio-Economic/Environmental Consequences

Based on the Community Block Grant Program's *2013 Method of Distribution*, approximately 52.6% of the Falls City community is characterized as having low to moderate income.

10.9.1 Environmental Consequences

None of the proposed projects or alternatives would cause disproportionately high adverse human health or environmental effect to low income population in Falls City.

10.9.2 Mitigation

No mitigation is required for socio-economic issues since there are no disproportionately high adverse human or environmental effects to minority or low-income populations that were identified.

10.10 Air Quality

Areas of the country where air pollution levels persistently exceed the National Ambient Air Quality Standards may be designated "nonattainment." The National Ambient Air Quality Standards are health standards for lead, carbon monoxide, sulfur dioxide, ground level (1-hour and 8-hour) ozone, and particulate matter (PM10 and PM-2.5). There are no nitrogen dioxide nonattainment areas. Polk County and Falls City are not within any of the nonattainment areas. Oregon's State Implementation Plan (SIP) does not have specific air quality requirements for construction. In addition, an air discharge permit is not required.

10.10.1 Environmental Consequences

No-Action. This alternative is not likely to have short- or long-term consequences on air pollution. However, the failing treatment and drainfield may result in nuisance odors.

Fairoaks Pump Station Decommissioning. Short-term air pollution may occur within the area due to the project construction. This may include dust, emission form construction vehicles, etc. No long-term impacts are anticipated. Bypass pumping will be needed to prevent overflows and sewage in lines from going septic creating nuisance odors.

Repair Collection System. There may be short-term air pollution within the area due to the project construction, such as dust, emission form construction vehicles, etc. Additionally, the failing treatment and drainfield may result in nuisance odors.

Upgrade RGF. Additional air pollution may occur within the area due to the project construction. Upgrades to the treatment facility should reduce the risk of nuisance odors from the site. Bypass pumping will be needed to prevent overflows and sewage in lines from going septic creating nuisance odors.

New Lagoons System. Short-term air pollution may occur within the area due to the project construction. Excessive dust due to construction should be kept to a minimum with appropriate measures for dust control. Construction vehicles and equipment should be kept in proper running condition with emission equipment working properly to not create excess air pollution. Additionally, there is a risk that the lagoons may omit unwelcomed odors if not properly designed and operated.

10.10.2 Mitigation

Mitigation measures for air quality include the following:

- Dust control measures shall be implemented to prevent the creation of excessive dust during construction to ensure the avoidance of nuisance impacts to local residents and other sensitive receptors.
- To ensure that odors associated with sewage do not cause nuisance impacts to residents or other sensitive receptors, the contractor will bypass pump when required to prevent overflows and sewage in lines from going septic. Contractors should have spare pumps to ensure overflows will not occur if one pump is not working properly or cannot handle the flow. In addition, the constructor should have a plan for sewage clean up if an accidental spill does occur.
- Construction vehicles and equipment should be kept in proper running condition with emission equipment working properly to not create excess air pollution.
- Design and operation of the treatment and holding lagoon should be such that anaerobic conditions will be avoided. In the event that the system is not able to maintain aerated conditions in the upper layer of the lagoon, the system will be retrofitted with mechanical mixer or air diffusers.

10.11 TRANSPORTATION

The proposed project will not affect airport clearance or accidental zones. Construction will likely disrupt normal traffic within the City due to construction within road right-of-ways and with construction vehicles enter and leaving the construction areas.

10.11.1 ENVIRONMENTAL CONSEQUENCES

As with most construction that occurs within a City, there are likely to be traffic delays. This is especially true where construction will be within roadways. In addition, construction traffic entering and exiting the WWTP and new lagoon sites are likely to cause additional traffic congestion. A traffic control plan will need to be developed including signage, flaggers, steel plates, detours, and/or road closures. This plan will need to be coordinated with local emergency agencies (such as fire, police, and medical) and other local agencies to enable the continuation of their services.

10.11.2 MITIGATION

Mitigation measures for transportation include the following:

- A traffic control plan will need to be developed including signage, flaggers, steel plates, detours, and/or road closures.
- Construction vehicles going to the work sites should only use main roads (if possible) to prevent wear and tear of the side streets and to reduce traffic on side streets.
- Visible signs will be posted on-site at least 24-hours prior to an expected obstruction to prevent potential temporary obstructions to vehicles that need to exit residential driveways or public or commercial parking lots.
- The contractor will be required to cover trenches with appropriate load-bearing cover to allow access until the trench is filled if open trenches located between roadways and parking lots and/or driveways are not filled within one day.
- The contractor shall notify local emergency response departments and hospitals prior to lane closures and detours being in effect to ensure continuous efficient access for emergency response vehicles.

10.12 NOISE

During the construction of the proposed project it is likely that noise levels within the City will increase, however, the finished project will not likely impact the noise levels within the City.

10.12.1 ENVIRONMENTAL CONSEQUENCES

No-Action. This alternative is not likely to increase the level of noise within the City.

Fairoaks Pump Station Decommissioning. This project will likely lower the amount of noise by removing a pump station from the collection system. The new gravity line will be located underground and will not contribute noise to the City. During construction noise levels are likely to rise within the City due to construction vehicles and equipment.

Repair Collection System. This alternative should have little impact on noise levels within the City. During construction, noise levels are likely to rise due to construction vehicles and equipment.

Upgrade RGF. There would be very limited impact on traffic due to this alternative. Construction traffic entering and exiting the WWTP site are likely to cause localized traffic congestion. No long-term impact on traffic is expected.

New Lagoons System. Minimal noise disturbance will occur from this alternative. The new pump station will be underground in a vault. The new force main will be located underground and will not contribute noise to the City. The lagoons will have no mechanical devices and will not attribute to noise levels. Minimal impact to noise levels is expected from the disinfection system. Emergency generators will produce additional noise when they are running during power outages and for routine maintenance. Emergency generators will be required to have noise attenuation devices. Additionally, during construction noise levels are likely to rise within the City due to construction vehicles and equipment.

10.12.2 MITIGATION

Construction mitigation measures for noise will be the following:

- Construction activities should be limited to the hours between 7:00 am and 7:30 pm Monday through Friday.
- Noise attenuation devices should be used on construction vehicles and equipment to reduce noise levels.
- If feasible, the contractor shall employ additional mitigation measures to reduce noise levels to an acceptable level if sensitive receptors notify the City of nuisance caused by noise generated during continuous construction activities.
- Generators will also require sound attenuation devices that meet the required codes and regulations.

11 REFERENCES

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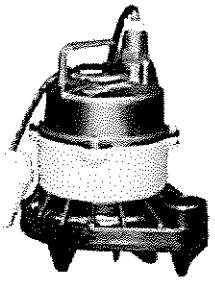
Appendix A: Equipment Data

This appendix includes equipment data sheets and manuals that were discovered while researching the Wastewater Facility Plan and, in some cases, used as the best available evidence of components for analysis purposes. Records of actual components were generally not available during the development of this plan. For those components like pumps, not visible unless removed from service, it should be noted that actual equipment in use may be significantly different than what is listed in this appendix.

The pump manual for the Gould EP0411 pump can be seen in this section. It is believed that this is the pump used in the Carey Court pump station as indicated on the As-Constructed drawings.

GOULDS PUMPS



Submersible Effluent Pump

MODEL 3871

EP04 & EP05 Series

APPLICATIONS

Specifically designed for the following uses:

- Effluent systems
- Homes
- Farms
- Heavy duty sump
- Water transfer
- Dewatering

SPECIFICATIONS

- Solids handling capability: 3/4" maximum.
- Capacities: up to 60 GPM.
- Total heads: up to 31 feet.
- Discharge size: 1½" NPT.
- Mechanical seal: carbon-rotary/ceramic-stationary, BUNA-N elastomers.
- Temperature: 104° F (40° C) continuous 140° F (60° C) intermittent.
- Fasteners: 300 series stainless steel.
- Capable of running dry without damage to components.

Motor:

- EP04 Single phase: 0.4 HP, 115 or 230 V, 60 Hz, 1550 RPM, built in overload with automatic reset.
- EP05 Single phase: 0.5 HP, 115 V or 230V, 60 Hz, 1550 RPM, built in overload with automatic reset.
- Power cord: 10 foot standard length, 16/3 SJTW with three prong grounding plug. Optional 20 foot length, 16/3 SJTW with three prong grounding plug (standard on EP05).
- Fully submerged in high grade turbine oil for lubrication and efficient heat transfer.

Available for automatic and manual operation. Automatic models include Mechanical Float Switch assembled and preset at the factory.

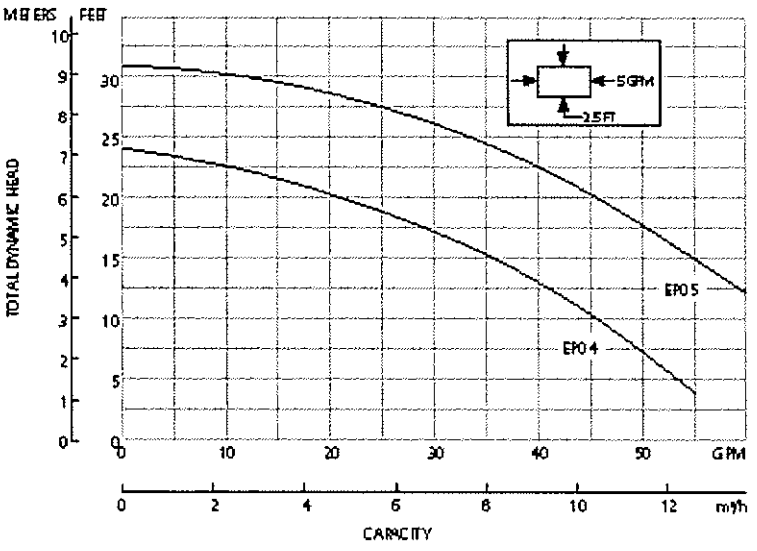
FEATURES

- EP04 Impeller: Thermoplastic semi-open design with pump out vanes for mechanical seal protection.
- EP05 Impeller: Thermoplastic enclosed design for improved performance.
- Casing and Base: Rugged thermoplastic design provides superior strength and corrosion resistance.
- Motor Housing: Cast iron for efficient heat transfer, strength, and durability.
- Motor Cover: Thermoplastic cover with integral handle and float switch attachment points.
- Power Cable: Severe duty rated oil and water resistant.
- Bearings: Upper and lower heavy duty ball bearing construction.

AGENCY LISTING

Canadian Standards Association File # LR38549

Goulds Pumps is ISO9001 Registered.



Goulds Pumps

ITT Industries

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B3871

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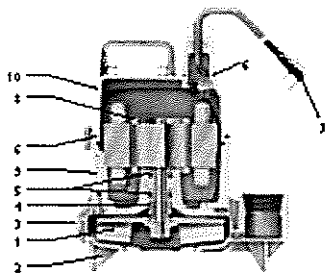
GOULDS PUMPS



Submersible Effluent Pump

MODEL 3871

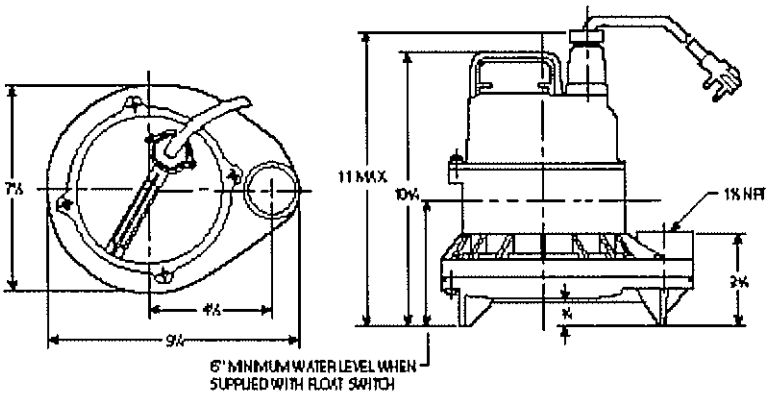
EP04 & EP05 Series

COMPONENTS

Item No.	Description
1	Impeller
2	Base
3	Pump Casing
4	Mechanical Seal
5	Ball Bearings
6	O-Rings
7	Power Cord
8	Oil Filled Motor
9	Motor Housing/ Stator Assembly
10	Motor Cover

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



PERFORMANCE RATINGS

Total Head (ft. of water)	Gallons Per Minute	
	EP04	EP05
5	53	-
10	46	62
15	36	55
20	21	46
25	0	33
30	-	11

MODEL INFORMATION

Order No.	HP	Volts	Amps	Minimum Circuit Breaker	Phase	Float Switch Style	Cord Length	Discharge Connection	Minimum On Level	Minimum Off Level	Minimum Basin Diameter	Maximum Solids Size	Shipping Weight lbs/kg
EP0411	.4	115	12	20	1	Plug/NoSwitch	10'	1¼"	Manual	Manual	15"	½"	20/9.1
EP0411A						Piggyback/Wide-Angle	10'	1¼"	12"	6"	15"		21/9.5
EP0411F						Plug/NoSwitch	20'	1¼"	Manual	Manual	15"		20/9.1
EP0411AC						Piggyback/Wide-Angle	20'	1¼"	12"	6"	15"		21/9.5
EP0412		230	6	10		Plug/NoSwitch	10'	1¼"	Manual	Manual	15"		20/9.1
EP0412F						Plug/NoSwitch	20'	1¼"	Manual	Manual	15"		20/9.1
EP0511F	.5	115	13	20		Plug/NoSwitch	20'	1¼"	Manual	Manual	15"		22/10
EP0511AC						Piggyback/Wide-Angle	20'	1¼"	12"	6"	15"		23/10.4
EP0512F		230	6.5	10		Plug/NoSwitch	20'	1¼"	Manual	Manual	15"		22/10

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SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Goulds Pumps

ITT Industries

Appendix B: Oregon Water and Wastewater Funding and Resource Guide

The purpose of the Oregon Water & Wastewater Funding and Resource Guide is to help smaller, rural communities find funding for water and wastewater projects.

RCAC
www.rcac.org

OREGON WATER & WASTEWATER

FUNDING AND RESOURCE GUIDE

Updated April 2011

BACKGROUND AND PURPOSE

Rural Community Assistance Corporation (RCAC), a private non-profit organization serving 13 states in the West, helps rural communities achieve their vision and goals through training, technical assistance, and access to resources. In Oregon, we work with funding and regulatory agencies and partners to address compliance issues for lower income rural communities by helping with water and wastewater infrastructure projects. The purpose of the RCAC Oregon Water Wastewater Funding and Resource Guide is to provide an easy to use document which identifies water and wastewater funding programs, agencies, and organizational resources. It is our hope that this guide will be used as a tool to help you move forward with water and wastewater infrastructure projects in Oregon.

SCOPE

The Guide provides information on primary agency funding programs which support planning, predevelopment, and construction of drinking water and wastewater infrastructure projects in Oregon. It also includes information on resources available to assist communities with completing drinking water and wastewater projects addressing regulatory compliance, drinking water protection, improving water quality and local public health.

CONTENTS

- **Agencies Serving Water/Wastewater Needs for Small Communities in Oregon**
- **Funding Programs for Water and Wastewater Project in Oregon**
- **Oregon Drinking Water Protection Resources**

KEY PROJECT STAGES

- **Planning**
- **Predevelopment**
- **Engineering and Design**
- **Construction**

The Guide will help you identify agencies and resource organizations to work with on regulatory issues, funding, training and technical assistance to move your project forward.

The RCAC Oregon Water Wastewater Funding and Resource Guide is funded as part of the U.S. Department of Health and Human Services (HHS), Rural Community Development Activities Program, and was compiled in partnership with agencies and organizations by the Rural Community Assistance Corporation (RCAC), the western regional affiliate of the national Rural Community Assistance Partnership (RCAP).

For more information on Rural Community Assistance Corporation see: www.rcac.org

Agencies Serving Water/Wastewater Needs of Small Communities in Oregon

U.S. Environmental Protection Agency EPA Region 10 Oregon Operations Office 805 SW Broadway, Suite 500 Portland, OR 97205 Joel Salter Oregon Water Programs Coordinator Phone: (503)326-2653 Email: Salter.Joel@epa.gov	**United States Department of Agriculture Rural Development (USDA RD)** 1201 NE Lloyd Blvd., Ste. 801 Portland, OR 97232-1274 Sam Goldstein, Community Programs Director Phone: (503) 414-3362 Email: Sam.goldstein@or.usda.gov Website: http://www.rurdev.usda.gov/ORcp.html
U.S. Department of Health and Human Services Portland Area Indian Health Service 1414 NW Northrup Street, Suite 800 Portland, OR 97209 **Phone:** 503/414-5555 **Website:** www.ihs.gov	**U.S. Economic Development Administration (EDA)** 121 SW Salmon Street, Suite 244 Portland, OR 97204 David Porter, Economic Development Representative Phone: 503/326-3078 Email: dporter@eda.doc.gov
Oregon Health Authority (OHA) Drinking Water Program PO Box 14450 Portland, OR 97293-0450 Phone: 971-673-0422 Website: http://public.health.oregon.gov/PHD/OEPH/DWP/Pages/index.aspx Tony Fields, Planning Protection & Certification, 971-673-2269 Marsha Fox, Plan Review, 971-673-0408 Tom Pattee, Groundwater Protection, 541-726-2587 ext 24 Chris Hughes, Technical Services Region 1, 971-673-0411 Karen Kelley, Technical Services Region 2, 541-726-2587 ext 22 Technical Assistance: HBH Consulting Engineers, 503-625-8065	**Oregon Business Development Department (OBDD)** Infrastructure Finance Authority 775 Summer St. NE, Suite 200 Salem, OR 97301-1280 Phone: (503)986-0123 Email: infrastruture.info@state.or.us Website: www.oregon.gov/OBDD
Oregon Department of Environmental Quality (DEQ) 811 SW Sixth Avenue Portland, OR 97204-1390 **Clean Water State Revolving Fund** Manette Simpson, Program Coordinator: 503-229-5622 Rick Watters: 503-229-6814 Kim Carlson: 503-229-6312 Larry McCallister: 503-229-6412 Website: www.deq.state.or.us/wq/loans/loans.htm **Drinking Water Protection Program** Sheree Stewart, Program Coordinator: 503-229-5413 Julie Harvey: 503-229-5664 Website: www.deq.state.or.us/wq/dwp/dwp.htm	**Rural Community Assistance Corporation (RCAC)** 1020 S.W. Taylor Street Suite 450 Portland, OR 97205 Chris Marko, Rural Development Specialist Phone: (503) 228-1780 Email: cmarko@rcac.org Website: www.rcac.org

ADDITIONAL RESOURCES FOR WATER/WASTEWATER NEEDS	
Association of Oregon Counties 1201 Court St NE Suite 300 Salem, OR 97301 PO Box 12729 Salem, OR 97309 Phone: (503) 585-8351 Website: www.aocweb.org	**League of Oregon Cities** 1201 Court St. NE, Suite 200 Salem, OR 97301 P.O. Box 928 Salem, OR 97308 Phone: (503) 588-6550 Website: www.orcities.org
Special Districts Association of Oregon Po Box 12613 Salem, OR 97309 (503) 371-8667 Website: www.sdao.com	**Oregon Water Resources Department** 725 Summer Street NE, Suite A Salem, OR 97301 Phone: 503-986-0900 Website: www.wrd.state.or.us
Oregon Association of Water Utilities 935 N Main Street Independence, Oregon 97351 Phone: (503) 837-1212 Website: www.oawu.net	**Oregon Watershed Enhancement Board** 775 Summer St. NE Suite 360 Salem, OR 97301 Phone: (503) 986-0178 Website: www.oregon.gov/OWEB

Regulatory Information

Safe Drinking Water Act (SDWA): www.epa.gov/safewater/sdwa/index.html

Clean Water Act (CWA): http://www.epa.gov/lawsregs/laws/cwa.html

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ROGRAMS FOR WATER AND WASTEWATER PROJECTS IN OREGON
Predevelopment

	Eligible Projects	Eligible Applicants	Funding Available	How To Apply
ock Final nts	Preliminary Engineering and Planning - Water Master Plans, Wastewater Facilities Plans, Water Conservation and Management Plans, Capital Improvement Plans, sanitary surveys, inflow and infiltration studies. Final Engineering – Preliminary Engineering Reports, studies	Projects must principally benefit low to moderate income people in non-entitlement cities and counties: cities less than 50,000 and counties less than 200,000 population. Projects must serve primarily residential needs, not primarily for capacity building.	• Grants up to $150,000 for preliminary engineering and planning • Grants up to $1,000,000 for final design engineering and construction	Competitive application year-round and reviewe awards are subject to fu Contact the Oregon Bus Development Departme 503-986-0123 and ask f coordinator, or view pro www.orinfrastructure.or
Vorks	Preliminary engineering studies; and economic investigations related to municipal utility projects (water, wastewater, stormwater)	Cities, counties, county service districts (ORS Chapter 451), Tribes, ports, & districts (ORS 198.010)	• Grants up to $60,000 or 85% of project costs. • Loans available at reduced interest rates/7-year term.	Apply year-round based availability. Contact OBDD at 503-9 for your regional coordi program details at: www.orinfrastructure.or
ter er) nce	Preliminary planning, engineering studies and economic investigations in preparation for construction projects that address an existing or pending compliance issue.	Cities, counties, county service districts (ORS Chapter 451), tribes, ports and districts (ORS 198.010). For a population of less than 15,000 with a Notice of Non-compliance or potential notice.	• Grants up to $20,000 • Loans up to $20,000	Apply year-round based availability. Contact OBDD at 503-9 for the regional coordin program details at: www.orinfrastructure.or
PPG)	Water and/or wastewater planning; preliminary engineering reports, environmental reports, and other work to assist in developing a project that is expected to be funded by RD in the next 12 – 18 months.	Public bodies (such as municipality, county, district or authority); non-profit organizations, and Indian tribes. Priority given to rural area populations under 1,000.	• Maximum $15,000 grant or 75% of project costs, whichever is less.	Apply year-round based availability. Contact USDA Rural D Oregon State Office at 5 and ask for your regiona or view program details www.rurdev.usda.gov/L predevelopment.htm
ity , und	Water and/or wastewater planning; environmental work; and other work to assist in developing an application for infrastructure improvements	Nonprofit organizations, public agencies and tribes serving low-income rural communities with a population of 50,000 or less, or 10,000 if guaranteed by USDA RD financing	• Max $50,000 for feasibility loan • Max $350,000 for predevelopment loan • 1 year term • Interest rate @ 5.5%	Applications accepted a Contact: Josh Griff at 72 jgriff@rcac.org. Applications available o www.rcac.org

NG PROGRAMS FOR WATER AND WASTEWATER PROJECTS IN OREGON
ection

	Eligible Projects	Eligible Applicants	Funding Available	How To Apply
ity ent Block DBG)	All projects must be in accordance with a approved water plan or wastewater plan. Eligible activities include: construction engineering; construction management; acquisition of property (including easements); grant administration; and audits. Projects addressing an existing or pending compliance issue will score higher.	Projects must principally benefit low to moderate income people in non-entitlement cities and counties: **cities less than 50,000 and counties less than 200,000 population.** Projects must serve primarily residential needs and not be for capacity building	• Maximum Grant of $2 million, subject to the maximum $2 million per project limitation during a five-year period • Single grant may be awarded to cover final engineering and construction.	Competitive applications accep round and reviewed quarterly awards are subject to funding a Contact OECD at 503-986-012 for your regional coordinator or program information at www.oregoninvestnature.org.
ion Grants				
ublic Works PWF)	Planning for raising and managing funds, pre-construction and construction of water, wastewater, stormwater projects. Projects must be publically owned and support economic and community development in Oregon	Cities, counties, county service districts (ORS Chapter 451), tribes, ports and districts (ORS 198.010)	• Primarily a loan program • Maximum $9 million loan • 25 year term maximum • Grants based on retention or creation of jobs, up to max. of $5,000 per job • Grants cannot exceed $500,000 or 85% of the project cost, whichever is less	Apply year-round, based on fun availability Contact OECD at 503-986-012 for your regional coordinator or program details at www.oregoninvestnature.org.
astewater g (WWF)	Planning, pre-construction, and construction improvements of drinking water, wastewater, or stormwater projects. Projects must be publically owned and address an existing or pending compliance issue.	Cities, counties, county service districts (ORS Chapter 451), tribes, ports, & districts (ORS 198.010)	• Maximum $9 million loan • 25 year term maximum • Grant eligibility based on median household income • Maximum $750,000 grant	Competitive applications are ac yearround and reviewed quarter awards are subject to funding a Contact OECD at 503-986-012 for your regional coordinator, o program details at www.oregoninvestnature.org.

ROGRAMS FOR WATER AND WASTEWATER PROJECTS IN OREGON
Cont.

	Eligible Projects	Eligible Applicants	Funding Available	How To Apply
Water Fund	Drinking water system projects must resolve a health hazard or non-compliance issue. Eligible activities include planning, engineering, design, construction, property acquisition, environmental review, legal costs, and security.	Community & non-community water systems, except federally owned systems.	• Max $6 million • Interest rate fluctuates quarterly (set at 80% of state/local bond rate). • 20-year term maximum • Disadvantaged community eligible for a 30-year term • Principle forgiveness possible	A letter of interest must b be eligible for funding co Check with OHA on sub Contract Oregon OHA D Program; call 971-673-0 OHA website: www.oregon.gov/dhs/ph or contact OEDD at 503-
F u)	Source water protection projects to carry out elements of a Source Water Protection Management Plan.	Community water systems that have a delineated Drinking Water Protection Area and are able to demonstrate a direct link between the proposed project and maintaining or improving drinking water quality.	• Max $100,000 loan • Interest rate fluctuates quarterly (set at 80% of state/local bond rate) • 20 year term • Disadvantaged community eligible for a 30-year term • Grants also available	A letter of interest must b be eligible for funding co Check with OHA on subs Contact Oregon OHA Dr Program; call 971-673-0 OEDD at 503-986-0123 www.orinfrastructure.org
late f	Planning, design, and construction projects associated with publicly-owned wastewater treatment facilities. Loans also available for emergencies, urgent repair, and local community projects that address water pollution (including non-point sources of pollution). Interim financing also available.	Indian tribal governments, cities, counties, sanitary districts, soil and water conservation districts, irrigation districts, various special districts and certain intergovernmental entities	• Loan only • Up to 20 year term • Substantially discounted interest depending on loan type • Annual loan fee of 0.5% of the outstanding balance (planning loans exempt from this fee) • Possible principle forgiveness	Applications accepted ye scheduled review and ran week of January, May an Contact the Oregon Depa Environmental Quality (I Manette Simpson at 503/ simpson.manette@deq.st contact your local project list of officers, go to www.deq.state.or.us/wq/

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OGRAMS FOR WATER AND WASTEWATER PROJECTS IN OREGON

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	Eligible Projects	Eligible Applicants	Funding Available	How To Apply
	Pre-construction & construction associated with constructing, repairing, or improving water, sewer, solic waste or storm wastewater disposal facilities	Public bodies (such as municipality, county, district, or authority), non-profit organizations and Indian tribes serving financially needy communities with service area populations<10,000.	• Primarily loan program • Grants based on need • Interest rates track AA rated 20 yr muni. bonds and fixed for life of loan • Lower income communities receive an interest rate subsidy • Up to 40-year loan term	Apply year-round based on availability. Contact USDA Development. Oregon State 503-414-3360 and ask for y loan specialist or view progr www.rurdev.usda.gov/ORsi
	Water, wastewater, solid waste and storm facilities that primarily serve low income rural communities. Includes predevelopment costs	Non-profit organizations, public agencies, and tribal governments rural areas with populations of 50,000 or less, or 10,000 if using RD financing as the takeout	• Max $2 million with commitment letter for permanent financing • Security in permanent loan letter of conditions • 1-3 year term • 1% loan fee • Interest rate 5.5%	Applications are accepted a Contact Josh Griff at 720-8 email jgriff@rcac.org Applications available on-l www.rcac.org
f	Water, wastewater, solid waste and storm facilities that primarily serve low income rural communities. Includes predevelopment costs	Non-profit organizations, public agencies, and tribal governments rural areas with populations of 50,000 or less, or 10,000 if using RD financing as the takeout	• For smaller capital needs projects • Normally not to exceed $150,000 • Up to 20 year term • Interest rate 5.5%	Applications are accepted a Contact Josh Griff at 720-8 email jgriff@rcac.org Applications available on-l www.rcac.org
s	EDA's mission is to help economically distressed communities in ways that help them build long-term economic development capacity. Projects must foster the creation or retention of higher-skilled, higher-wage employment opportunities for local displaced workers and attract private-sector capital investment	Indian Tribes, state, county, city or other political subdivisions of a state, institutions of higher education, public or private non-profit organizations or associations	• Public Works grant awards are in the range of $500,000 – 2,500,000 with 50% local matching funds required • Grant funds received from other Federal Agencies may not be used to satisfy local share match	Visit agency website at www and review latest "Federal F Announcement" (FFO). Submit application through www.grants.gov

Appendix C: NPDES Permit

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT
Department of Environmental Quality
Western Region – Salem Office
750 Front Street NE, Suite 120, Salem, OR 97301-1039
Telephone: (503) 378-8240

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

ISSUED TO:
Falls City, City of
PO Box 160
Falls City, OR 97344

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Treated Municipal Wastewater	001	R.M. 12.0 Little Luckiamute R.
	002	Soil Adsorption Drainfield

FACILITY TYPE AND LOCATION:
Recirculating Gravel Filter
City of Falls City
4 miles east of Hwy 223 behind High School

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

RECEIVING STREAM INFORMATION:
Basin: Willamette
Sub-Basin: Middle Willamette

Receiving Stream: Little Luckiamute River
LLID: 1232878447914 12.0 D
County: Polk

EPA REFERENCE NO: OR003270-1

Issued in response to Application No. 982344 received January 28, 2005. This permit is issued based on the land use findings in the permit record.

John J. Rusciano, Water Quality Manager
Western Region North

August 22, 2007
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify, or operate a wastewater collection, treatment, control and disposal system and discharge to public waters adequately treated wastewaters only from the authorized discharge point or points established in Schedule A and only in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

Page
Schedule A - Waste Discharge Limitations not to be Exceeded 2
Schedule B - Minimum Monitoring and Reporting Requirements 4
Schedule C - Compliance Conditions and Schedules 7
Schedule D - Special Conditions 8
Schedule F - General Conditions 10

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

SCHEDULE A

1. **Waste Discharge Limitations not to be exceeded after permit issuance.**

a. Treated Effluent Outfall 001 (Discharge to the Little Luckiamute River not to exceed 0.02625 MGD)

(1) May 1 - October 31: No discharge to waters of the State (unless approved in writing by the Department)

(2) November 1 - April 30:

Parameter	Average Effluent Concentrations Monthly	Weekly	Monthly* Average lb/day	Weekly* Average lb/day	Daily* Maximum Lbs
BOD_5	20 mg/L	30 mg/L	4.4	6.6	8.8
TSS	20 mg/L	30 mg/L	4.4	6.6	8.8

*Winter mass load limits based upon average wet weather design flow to the facility equaling 0.02625 MGD. When the daily flow exceeds 0.02625 MGD, the effluent shall be discharged through Outfall 002, the soil adsorption drainfield and the BOD_5 and TSS concentration and mass load limits shall not apply to the discharge to the soil adsorption drainfield

(3)

Other parameters (year-round)	Limitations
E. coli Bacteria	Shall not exceed 126 organisms per 100 mL monthly geometric mean. No single sample shall exceed 406 organisms per 100 mL. (See Note 1)
pH	Shall be within the range of 6.0 - 9.0
BOD_5 and TSS Removal Efficiency	Shall not be less than 85% monthly average for BOD_5 and 85% monthly for TSS. Monthly removal efficiency shall be calculated on an assumed influent BOD and TSS concentration of 200 mg/L).

(4) No wastes may be discharged or activities conducted that cause or contribute to a violation of water quality standards in OAR 340-041 applicable to the Willamette basin except as provided for in OAR 340-045-0080 and the following regulatory mixing zone:

The regulatory mixing zone is that portion of the Little Luckiamute River where the effluent mixes with 25 percent of the stream flow but in no case shall it extend farther than fifteen feet out from the outfall pipe and from a point ten feet upstream of the outfall to a point 200 feet downstream from the outfall. The Zone of Initial Dilution (ZID) shall be defined as that portion of the allowable mixing zone that is within three feet of the point of discharge.

(5) Chlorine and chlorine compounds shall not be used as a disinfecting agent of the treated effluent and no chlorine residual shall be allowed in the discharged effluent due to chlorine used for maintenance purposes.

(6) No wastes shall be discharged from this outfall except as allowed in Schedule F, Section B, Condition 6 of this permit. If an overflow occurs between May 22 and June 1, and if the permittee demonstrates to the Department's satisfaction that no increase in risk to beneficial

uses occurred because of the overflow, no violation shall be triggered if the storm associated with the overflow was greater than the one-in-five-year, 24-hour duration storm.

b. Treated Effluent 002 (Discharge to the soil adsorption field not to exceed 0.0532 MGD)

(1) All effluent shall be distributed to the soil adsorption drainfield for dissipation by controlled seepage by following sound practices so as to prevent:

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

(2) Unless otherwise approved in writing by the Department, a deep rooted, permanent grass cover shall be maintained on the area at all times.

c. No activities shall be conducted that could cause an adverse impact on existing or potential beneficial uses of groundwater. All wastewater and process related residuals shall be managed and disposed in a manner that will prevent a violation of the Groundwater Quality Protection Rules (OAR 340-040).

NOTES:

1. If a single sample exceeds 406 organisms per 100 mL, then five consecutive re-samples may be taken at four-hour intervals beginning within 48 hours after the original sample was taken. If the log mean of the five re-samples is less than or equal to 126 organisms per 100 mL, a violation shall not be triggered.

SCHEDULE B

1. **Minimum Monitoring and Reporting Requirements** (unless otherwise approved in writing by the Department).
The permittee shall monitor the parameters as specified below at the locations indicated. The laboratory used by the permittee to analyze samples shall have a quality assurance/quality control (QA/QC) program to verify the accuracy of sample analysis. If QA/QC requirements are not met for any analysis, the results shall be included in the report, but not used in calculations required by this permit. When possible, the permittee shall re-sample in a timely manner for parameters failing the QA/QC requirements, analyze the samples, and report the results.

a. Influent

The facility influent sampling locations are the following:

* Influent grab samples, measurements and composite samples are taken an influent monitoring manhole just prior to entering the recirculation tank.

Item or Parameter	Minimum Frequency	Type of Sample
Total Flow (MGD)	Daily	Measurement
Flow Meter Calibration	Annually (November)	Verification
BOD_5	1 per 2 Weeks	Grab
TSS	1 per 2 Weeks	Grab
pH	2/Week	Grab

b. Treated Effluent Outfall 001(Discharge to the Little Luckiamute River not to exceed 0.02625MGD)

The facility effluent sampling locations are the following:

* Effluent grab samples and measurements are taken from the effluent dosing tank. The bacteriological samples are taken from the channel just after the UV disinfection system.

Item or Parameter	Minimum Frequency	Type of Sample
Total Flow (MGD)	Daily	Measurement
Flow Meter Calibration	Annually (November)	Verification
BOD_5	1 per 2 Weeks	Grab
TSS	1 per 2 Weeks	Grab
pH	2/Week	Grab
Effluent Temperature	2/Week	Record
E. coli	1 per 2 Weeks	Grab (See Note 1)
UV Radiation Intensity	Daily	Reading (See Note 2)
Pounds Discharged (BOD_5 and TSS)	1 per 2 Weeks	Calculation
Average Percent Removed (BOD_5 and TSS)	Monthly	Calculation
TKN, NH3-N, NO2+NO3-N,	Monthly	Grab

c. Treated Effluent Outfall 002 (Discharge to the Soil Adsorption Field not to exceed 0.0532 MGD)

The facility effluent sampling locations are the following:
* Effluent grab samples and measurements are taken from either the dosing tank or from the splitter box prior to the soil adsorption drainfield.

Item or Parameter	Minimum Frequency	Type of Sample
Total Flow (MGD)	Daily	Measurement
Flow Meter Calibration	Annually (November)	Verification
BOD_5	1 per 2 Weeks	Grab
TSS	1 per 2 Weeks	Grab
pH	2/Week	Grab
TKN, NH3-N, NO2+NO3-N,	Monthly	Grab

d. Biosolids Management

Item or Parameter	Minimum Frequency	Type of Sample
Record of locations where septage is applied on each DEQ authorized site. (Site location maps to be maintained at the treatment facility for review upon request by DEQ.	Each Occurrence	Date, quantity and locations where septage was applied and recorded on site location map.

e. Other Parameters

Item or Parameter	Minimum Frequency	Type of Sample
Test pumps and alarms at Recirculation Tank	Quarterly	Visual/Audible
Test alarms at Dosing Tank	Quarterly	Visual/Audible
Inspect pump screens at Recirculation and Dosing Tanks	Annually (August)	Visual
Inspect, clean, and maintain gravel filter laterals	Annually (August)	Flush
Depth of effluent in soil adsorption trenches	March 1 and Sept. 1	Measurement

f. Maintenance Activities

The permittee shall implement preventative maintenance practices or corrections in accordance with the following time schedule:

- All septic tanks connected to the City's wastewater collection system are to be inspected and tested for depth of sludge and scum every two years.
- Pump residential septic tanks either when sludge and scum volume exceeds 25% of the liquid capacity of the tanks or every five years, whichever is less; commercial septic tanks either when sludge and scum volume exceeds 25% of the liquid capacity of the tanks or every four years, whichever is less.
- Clean pump screens when 25% of the screen surface area becomes clogged.
- Pump solids from each recirculation tank a minimum of once every five years.

2. **Reporting Procedures**

a. Monitoring results shall be reported on approved forms. The reporting period is the calendar month. Reports must be submitted to the Department's Western Region - Salem office by the 15th day of the following month.

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

c. Monitoring reports shall also include a record of the quantity and method of use of all sludge removed from the treatment facility and a record of all applicable equipment breakdowns and bypassing.

3. **Report Submittals**

a. The permittee shall have in place a program to identify and reduce inflow and infiltration into the sewage collection system. An annual report shall be submitted to the Department by February 1 each year which details sewer collection maintenance activities that reduce inflow and infiltration. The report shall state those activities that have been done in the previous year and those activities planned for the following year.

NOTES:

1. *E. coli* monitoring must be conducted according to any of the following test procedures as specified in **Standard Methods for the Examination of Water and Wastewater, 19th Edition**, or according to any test procedure that has been authorized and approved in writing by the Director or an authorized representative:

Method	Reference	Page	Method Number
mTEC agar, MF	Standard Methods, 18th Edition	9-29	9213 D
NA-MUG, MF	Standard Methods, 19th Edition	9-63	9222 G
Chromogenic Substrate, MPN	Standard Methods, 19th Edition	9-65	9223 B
Colilert QT	Idexx Laboratories, Inc.		

2. The intensity of UV radiation passing through the water column will affect the systems ability to kill organisms. To track the reduction in intensity, the UV disinfection system must include a UV intensity meter with a sensor located in the water column at a specified distance from the UV bulbs. This meter will measure the intensity of UV radiation in mWatts-seconds/cm2. The daily UV radiation intensity shall be determined by reading the meter each day. If more than one meter is used, the daily recording will be an average of all meter readings each day.

SCHEDULE C

Compliance Schedules and Conditions

1. By no later than one year after permit issuance, the permittee shall submit an approvable plan and schedule for a long term collection system replacement program to reduce the amount of Infiltration and Inflow. Upon Department approval, the permittee shall implement the plan.

2. By no later than 90 days after permit issuance, the permittee shall submit to the Department a report which either identifies known sewage overflow locations and a plan for estimating the frequency, duration and quantity of sewage overflowing, or confirms that there are no overflow points. The report shall also provide a schedule to eliminate the overflow(s), if any.

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

SCHEDULE D

Special Conditions

1. The permittee shall comply with Oregon Administrative Rules (OAR), Chapter 340, Division 49, "Regulations Pertaining To Certification of Wastewater System Operator Personnel" and accordingly:

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

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

   b. The permittee's wastewater system may not be without supervision (as required by Special Condition 1.a. above) for more than thirty (30) days unless otherwise authorized by the Department of Environmental Quality in writing.

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

   d. The permittee shall notify the Department of Environmental Quality in writing within thirty (30) days of replacement or re-designation of certified operators responsible for supervising wastewater system operation. The notice shall be filed with the Water Quality Division, Operator Certification Program, 400 East Scenic Drive, Suite 307, The Dalles, OR 97058. This requirement is in addition to the reporting requirements contained under Schedule B of this permit.

   e. Upon written request, the Department may grant the permittee reasonable time, not to exceed 120 days, to obtain the services of a qualified person to supervise the wastewater system. The written request must include justification for the time needed, a schedule for recruiting and hiring, the date the system supervisor availability ceased and the name of the alternate system supervisor(s) as required by 1.b. above.

2. The permittee shall not be required to perform a hydrogeologic characterization or groundwater monitoring during the term of this permit provided:

   a. The facilities are operated in accordance with the permit conditions, and;

   b. There are no adverse groundwater quality impacts (complaints or other indirect evidence) resulting from the facility's operation.

   If warranted, at permit renewal the Department may evaluate the need for a full assessment of the facilities impact on groundwater quality.

3. All reclaimed water used at the treatment plant site for landscape irrigation will be exempt from OAR 340-055 provided the reclaimed water receives secondary treatment and disinfection. All landscape irrigation

must be confined to the treatment plant site. No spray or drift will be allowed off the treatment plant site. Landscape irrigation must be conducted following sound irrigation practices.

4. The permittee shall notify the DEQ Western Region - Salem Office (phone: (503) 378-8240) in accordance with the response times noted in the General Conditions of this permit, of any malfunction so that corrective action can be coordinated between the permittee and the Department.

SCHEDULE F
NPDES GENERAL CONDITIONS – DOMESTIC FACILITIES

SECTION A. STANDARD CONDITIONS

1. 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 the Clean Water Act, Oregon Revised Statutes (ORS) 468B.025, and 40 Code of Federal Regulations (CFR) Section 122.41(a), and grounds for an enforcement action. Failure to comply is also grounds for the Department to modify, revoke, or deny renewal of a permit.

2. Penalties for Water Pollution and Permit Condition Violations
ORS 468.140 allows the Department to impose civil penalties up to $10,000 per day for violation of a term, condition, or requirement of a permit. Additionally 40 CFR 122.41 (A) provides that any person who violates any permit condition, term, or requirement may be subject to a federal civil penalty not to exceed $25,000 per day for each violation.

Under ORS 468.943 and 40 CFR 122.41(a), unlawful water pollution, if committed by a person with criminal negligence, 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.

Under ORS 468.946, a person who knowingly discharges, places, or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state is subject to a Class B felony punishable by a fine not to exceed $200,000 and up to 10 years in prison. Additionally, under 40 CFR 122.41(a) any person who knowingly discharges, places, or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state is subject to a federal civil penalty not to exceed $100,000, and up to 6 years in prison.

3. 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 that has a reasonable likelihood of adversely affecting human health or the environment. In addition, upon request of the Department, 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.

4. 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.

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

5. 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

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.

6. Toxic Pollutants
The permittee must comply with any applicable effluent standards or prohibitions established under Oregon Administrative Rules (OAR) 340-041-0033 for toxic pollutants 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.

7. 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.

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

9. Permit Fees
The permittee must pay the fees required by Oregon Administrative Rules.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. 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.

2. 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.

3. Bypass of Treatment Facilities

a. Definitions
(1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The term "bypass" does not apply if the diversion does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation or the diversion is due to nonuse of nonessential treatment units or processes at the treatment facility.
(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities or treatment processes that 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 unless:
(a) Bypass was necessary to prevent loss of life, personal injury, or severe property damage;
(b) 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
(c) The permittee submitted notices and requests as required under General Condition B.3.c.
(2) The Department may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, when the Department determines that it will meet the three conditions listed above in General Condition B.3.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 the Department 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 D.5.

4. 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 B.4.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 D.5, hereof (24-hour notice); and
(4) The permittee complied with any remedial measures required under General Condition A.3 hereof.

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

5. 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 Clean Water Act effluent discharge pollutant parameter. A single operational upset does not include 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.

6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definitions
(1) "Overflow" means the diversion and discharge of waste streams from any portion of the wastewater conveyance system including pump stations, through a designed overflow device or structure, other than discharges to the wastewater treatment facility.
(2) "Severe property damage" means substantial physical damage to property, damage to the conveyance system or pump station which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of an overflow.
(3) "Uncontrolled overflow" means the diversion of waste streams other than through a designed overflow device or structure, for example to overflowing manholes or overflowing into residences, commercial establishments, or industries that may be connected to a conveyance system.

b. Prohibition of storm related overflows. Storm related overflows of raw sewage are prohibited to waters of the State. However, the Environmental Quality Commission (EQC) recognizes that it is impossible to design and construct a conveyance system that will prevent overflows under all storm conditions. The State of Oregon has determined that all wastewater conveyance systems should be designed to transport storm events up to a specific size to the treatment facility. Therefore, such storm related overflows will not be considered a violation of this permit if:
(1) The permittee has conveyance and treatment facilities adequate to prevent overflows except during a storm event greater than the one-in-five-year, 24-hour duration storm from November 1 through May 21 and except during a storm event greater than the one-in-ten-year, 24-hour duration storm from May 22 through October 31. However, overflows during a storm event less than the one-in-five-year, 24-hour duration storm from November 1 through May 21 are also not permit violations if, the permittee had separate sanitary and storm sewers on January 10, 1996, had experienced sanitary sewer overflows due to inflow and infiltration problems, and has submitted an acceptable plan to the Department to address these sanitary sewer overflows by January 1, 2010;
(2) The permittee has provided the highest and best practicable treatment and/or control of wastes, activities, and flows and has properly operated the conveyance and treatment facilities in compliance with General Condition B.1.;
(3) The permittee has minimized the potential environmental and public health impacts from the overflow; and
(4) The permittee has properly maintained the capacity of the conveyance system.

c. Prohibition of other overflows. All overflows other than stormwater-related overflows (discussed in Schedule F, Section B, Condition 6.b.) are prohibited unless:
(1) Overflows were unavoidable to prevent an uncontrolled overflow, loss of life, personal injury, or severe property damage;
(2) There were no feasible alternatives to the overflows, such as the use of auxiliary pumping or conveyance systems, or maximization of conveyance system storage; and
(3) The overflows are the result of an upset as defined in General Condition B.4. and meeting all requirements of this condition.

d. Uncontrolled overflows are prohibited where wastewater is likely to escape or be carried into the waters of the State by any means.

e. Reporting required. Unless otherwise specified in writing by the Department, all overflows and uncontrolled overflows must be reported orally to the Department within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D.5. Reports concerning storm related overflows must include information about the amount and intensity of the rainfall event causing the overflow.

7. Public Notification of Effluent Violation or Overflow
If effluent limitations specified in this permit are exceeded or an overflow occurs, upon request by the Department, the permittee must take such steps as are necessary to alert the public about the extent and nature of the discharge. 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.

8. 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

1. 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 shall be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points may not be changed without notification to and the approval of the Department.

2. 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.

3. Monitoring Procedures
Monitoring must be conducted according to test procedures approved under 40 CFR part 136, unless other test procedures have been specified in this permit.

4. Penalties of Tampering
The 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.

5. Reporting of Monitoring Results
Monitoring results must be summarized each month on a Discharge Monitoring Report form approved by the Department. 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.

6. 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 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 (e.g., Total Chlorine Residual), only the average daily value must be recorded unless otherwise specified in this permit.

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

8. Retention of Records
Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR part 503). The permittee must retain records of all monitoring information, including: all calibration, 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 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 the Department at any time.

9. 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.

10. Inspection and Entry

The permittee must allow the Department representative 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.

SECTION D. REPORTING REQUIREMENTS

1. Planned Changes
The permittee must comply with OAR chapter 340, division 52, "Review of Plans and Specifications" and 40 CFR Section 122.41(l) (1). Except where exempted under OAR chapter 340, division 52, 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 the Department. The permittee must give notice to the Department as soon as possible of any planned physical alternations or additions to the permitted facility.

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

3. 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 the rules of the Commission. No permit may be transferred to a third party without prior written approval from the Department. The Department 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 the Clean Water Act (see 40 CFR Section 122.61; in some cases, modification or revocation and reissuance is mandatory).. The permittee must notify the Department when a transfer of property interest takes place.

4. 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.

5. 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) within 24 hours, unless otherwise specified in this permit, from the time the permittee becomes aware of the circumstances. During normal business hours, the Department's Regional office must be called. Outside of normal business hours, the Department must be contacted at 1-800-452-0311 (Oregon Emergency Response System).

A written submission must also be provided within 5 days of the time the permittee becomes aware of the circumstances. Pursuant to ORS 468.959 (3) (a), if the permittee is establishing an affirmative defense of upset or bypass to any offense under ORS 468.922 to 468.946, delivered written notice must be made to the Department or other agency with regulatory jurisdiction within 4 (four) calendar days of the time the permittee becomes aware of the circumstances. The written submission 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;
d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and
e. Public notification steps taken, pursuant to General Condition B.7

The following must be included as information that must be reported within 24 hours under this paragraph:

f. Any unanticipated bypass that exceeds any effluent limitation in this permit;
g. Any upset that exceeds any effluent limitation in this permit;
h. Violation of maximum daily discharge limitation for any of the pollutants listed by the Department in this permit; and
i. Any noncompliance that may endanger human health or the environment.

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

6. Other Noncompliance
The permittee must report all instances of noncompliance not reported under General Condition D.4 or D.5, 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.

7. Duty to Provide Information
The permittee must furnish to the Department within a reasonable time any information that the Department may request to determine compliance with this permit. The permittee must also furnish to the Department, 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 the Department, it must promptly submit such facts or information.

8. Signatory Requirements
All applications, reports or information submitted to the Department must be signed and certified in accordance with 40 CFR Section 122.22.

9. 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 $100,000 per violation and up to 5 years in prison. 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 shall, 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.

10. Changes to Indirect Dischargers
The permittee must provide adequate notice to the Department 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 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 shall 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

1. *BOD* means five-day biochemical oxygen demand.
2. *CBOD* means five day carbonaceous biochemical oxygen demand
3. *TSS* means total suspended solids.
4. *"Bacteria"* includes but is not limited to fecal coliform bacteria, total coliform bacteria, and E. coli bacteria.
5. *FC* means fecal coliform bacteria.
6. *Total residual chlorine* means combined chlorine forms plus free residual chlorine
7. *Technology based permit effluent limitations* means technology-based treatment requirements as defined in 40 CFR Section 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR Chapter 340, Division 41.
8. *mg/l* means milligrams per liter.
9. *kg* means kilograms.
10. *m³/d* means cubic meters per day.
11. *MGD* means million gallons per day.
12. 24-hour *Composite sample* means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow. The sample must be collected and stored in accordance with 40 CFR part 136.
13. *Grab sample* means an individual discrete sample collected over a period of time not to exceed 15 minutes.
14. *Quarter* means January through March, April through June, July through September, or October through December.
15. *Month* means calendar month.
16. *Week* means a calendar week of Sunday through Saturday.
17. *POTW* means a publicly owned treatment works.

Appendix D: Maintenance Records and Observations

Table O-4: Septic Tank Pumping Records.

Service Address	Tank Size (G	Pump Date	Pump Date2	Pump Date3	Pump Date4	Pump Date5
10 S MAIN ST.						
100 PROSPECT ST.	1000	Jun-10				
101 MONTGOMERY ST						
108 N MAIN ST.	1500	Sep-89	Jul-95	Jun-08	Jun-09	
110 S MAIN ST.	1000	Oct-11				
111 3RD ST.		Jun-08				
111 N MAIN ST.		Nov-04	Apr-08	Jun-09	Jun-10	Jun-11
112 BRIDGE ST.						
118 N MAIN ST.		See 108 N Main St for pumping dates				
120 S MAIN ST.	1000	Jun-09				
123 PARRY RD.						
130 MONTGOMERY ST	1000	Sep-11				
130 S MAIN ST.						
131 CAREY CT.						
132 CAREY CT.	1500	Feb-11				
134 BRIDGE ST.						
134 CAREY CT.						
135 CAREY CT.	1500	Feb-11				
136 CAREY CT.						
137 CAREY CT.						
141 BRIDGE ST.						
150 1ST ST.	1000	Sep-96	Jun-08	Jun-10		
150 BRIDGE ST.	1000	Jun-09				
153 1ST ST.	1000	Sep-96	Jun-08	Jun-10		
153 3RD ST.		See 159 3RD St for pumping dates				
154 3RD ST.	1000	Sep-96	Jun-08	Oct-11		
156 DAYTON ST.	1000	Sep-89	Sep-96			
159 3RD ST.	1250	Jul-95	Nov-06	Jun-10		
159 DAYTON ST.	1250	Sep-89	Jul-95	Nov-04		
161 3RD ST.	1250	Jul-95	Jun-08	Jun-10		
162 4TH ST.	1000	Sep-96				
163 DAYTON ST.		See 159 Dayton St for pumping dates				
166 DAYTON ST.		See 180 Dayton St. for pumping dates				
166 ELLIS ST.	1000	May-11				
167 ELLIS ST.	1500	Oct-06	Jun-08	Jun-09	Jun-10	Sep-11
169 4TH ST.	1000	Jul-95				
169 ELLIS ST.		See 167 Ellis St for pumping dates				
171 DAYTON ST.	1000	Nov-96	Jun-08			
171 ELLIS ST.		See 167 Ellis St for pumping dates				
177 PROSPECT ST.	3000	Dec-06	Apr-08	Jun-09	Jun-10	Aug-11
180 DAYTON ST.	1250	Sep-89	Sep-96			
197 FAIROAKS ST.						
199 PINE ST.						
205 N MAIN ST.						
211 PARRY RD.						
212 N MAIN ST.	1250	Jun-08	Jun-10			
216 N MAIN ST.		See 212 N Main St for pumping dates				
217 N MAIN ST.		Reported by city that homeowner wont allow tank to be pumped				
220 S MAIN ST.	1000	Oct-11				
221 BRIDGE ST.						
234 PROSPECT ST.	1250	Aug-06	Jun-09	Jun-10	Jun-11	Mar-12
235 PROSPECT ST.						
240 S MAIN ST.						
242 N MAIN ST.						
246 S MAIN ST.						
250 2ND ST.						
253 2ND ST.						
256 PINE ST.	1000	Sep-89	Aug-95			
258 FAIROAKS ST.	1000	Jul-95	Jun-08			

26 S MAIN ST,	1000	Oct-11				
26 SHELDON AVE,						
260 5TH ST,	1000	Jul-95	Sep-96	Jun-08		
260 S MAIN ST,	1000	Jun-09				
268 6TH ST,	See 556 Mitchell St for pumping dates					
271 FAIROAKS ST,						
273 MILL ST,	1000	Jul-95				
279 MILL ST,	See 299 Mill St (City Hall) for pumping dates					
280 FAIROAKS ST,		Jun-08				
280 S MAIN ST,						
281 FAIROAKS ST,	281	Jun-08	Aug-11			
281 N MAIN ST,	See 285 N Main St for pumping dates					
284 N MAIN ST,	1000	Jul-95	Sep-96			
285 BRIDGE ST,						
285 N MAIN ST,	1250	Sep-89	Jul-95	Feb-10		
288 S MAIN ST,						
290 FAIROAKS ST,	See 490 Wood Street for pumping dates					
299 MILL ST,	1250	Jul-03	Oct-11			
303 N MAIN ST,						
304 N MAIN ST,	1250	Apr-91	Jul-95	Jun-08		
306 N MAIN ST,	See 304 N Main St for pumping dates					
314 N MAIN ST,						
318 N MAIN ST,	1200	Oct-07	Nov-10	Jun-11	Dec-11	
319 N MAIN ST,	1000	Jul-95	Jun-08	Jun-10	Jun-11	
32 S MAIN ST,	1000	Jun-09				
320 N MAIN ST,	see 318 N. Main Street for pumping dates					
321 N MAIN ST,						
34 SHELDON AVE,						
36 S MAIN ST,						
360 FAIROAKS ST,	1250	Sep-89	Jul-95			
360 S MAIN ST,						
364 FAIROAKS ST,	See 360 Fairoaks St for pumping dates					
368 FAIROAKS ST,	1500	Jul-95	Mar-04	Jun-10		
370 ALAN ST,						
371 5TH ST,	See 465 5th St for pumping dates					
379 ALDER ST,	1200	Mar-04	Jun-08	Aug-11		
380 BOUNDARY ST,						
380 S MAIN ST,	1500	Feb-11				
381 BOUNDARY ST,						
381 FAIROAKS ST,	See 234 Prospect St for pumping dates					
383 S MAIN ST,	1100	Jun-11				
390 ALAN ST,						
390 ALDER ST,	1000	Sep-92	Mar-04			
390 FAIROAKS ST,	See 368 Fairoaks St for pumping dates					
390 WOOD ST,		Mar-04				
394 ALDER ST,						
398 ALDER ST,	1500	Apr-91				
400 ALAN ST,	1500	Jun-10				
401 N MAIN ST,	1000	Aug-95				
404 N MAIN ST,	See 161 3RD St for pumping dates					
405 MITCHELL	3000	Nov-04	Apr-08	Jun-09	Jun-10	Jun-11
407 N MAIN ST,		Jun-08	Jun-10			
418 N MAIN ST, APT A	1000	Jul-95				
418 N MAIN ST, APT B						
420 N MAIN ST,	1000	Jun-08	Jun-10			
422 N MAIN ST,	1000	Aug-95				
435 TERRACE ST,						
439 TERRACE ST,	1000	Jun-10				
445 TERRACE ST,	1000	Jun-10				
452 FAIROAKS ST,	1250	Sep-89	Jul-95			

455 ALDER ST,	See 661 Bryant St for pumping dates				
456 PINE ST,	1000	Sep-96	Jun-08		
461 PROSPECT ST,	1000	Jul-95	Oct-11		
465 5TH ST,	1250	Feb-89	Jul-95		
471 PROSPECT ST,	1000	Sep-11			
475 5TH ST,	1250	Sep-92			
476 PROSPECT ST,	1200	Jul-92	Aug-04	Aug-11	Dec-11
479 PROSPECT ST,	1000	Aug-95			
480 ALDER STREET,	See 452 Fairoaks St for pumping dates				
485 PROSPECT ST,	1250	Sep-89	Jul-95	Nov-06	
486 PROSPECT ST,	1000	Sep-96			
490 WOOD ST,	1250	Sep-89	Jul-95	Aug-11	
494 FAIROAKS ST,	1000	Jun-08	Jun-10		
495 PROSPECT ST,	See 485 Prospect St for pumping dates				
496 5TH ST,					
496 FAIROAKS ST,	1000	Jun-10			
498 5TH ST,					
498 FAIROAKS ST,	1000	Jun-10			
513 HOPKINS ST,					
520 HOPKINS ST,					
521 HOPKINS ST,		Mar-04			
551 5TH ST,	1000	Sep-89			
554 MITCHELL	1000	Sep-96			
555 5TH ST,					
556 MITCHELL ST,	1250	Jul-95			
557 MITCHELL ST,	1000	Sep-96			
558 MITCHELL ST,	1000	Jul-95	Jun-08		
559 BRYANT ST,					
560 BRYANT ST,					
560 WOOD ST,					
561 BRYANT ST,	1500	Sep-89	Jul-95	Oct-09	
564 BRYANT ST,		Jun-08			
570 ALDER ST,	1000	Sep-89	Jul-95		
575 BRYANT ST,					
580 5TH ST,	1250	Apr-05			
580 WOOD ST,					
589 ALDER ST,					
61 PROSPECT ST,	1000	Jun-08	Jun-10	Feb-12	
65 PROSPECT ST,					
661 BRYANT ST,	1250	Apr-05	Jun-08	Apr-11	
669 BRYANT ST,					
670 MITCHELL ST,		Jun-08			
671 BRYANT ST,					
672 BRYANT ST,					
673 BRYANT ST,					
676 BRYANT ST,					
677 ALAN STREET,					
677 ALAN STREET,					
68 PROSPECT ST,	1000	Jul-95	Jun-08	Jun-10	
72 N MAIN ST,		Jun-08			
77 PROSPECT ST,					
79 N MAIN ST,					
80 N MAIN ST,					
85 BOUNDARY ST,		Sep-07			
85 N MAIN ST,					
86 N MAIN ST,	See 98 N Main St for pumping dates				
88 BOUNDARY ST,	1250	Nov-04			
90 PROSPECT ST,	1000	Jul-95	Jun-08	Jun-10	
93 N MAIN ST,					
98 N MAIN ST,	1250	Nov-04	Jun-08	Jun-09	

The following list is recommendations made by Dan Bush, Envirotech Northwest, Inc. after inspections made of the system.

From what have seen, learned, reviewed and read thus far, beyond the I & I issue, offer that the following components need attended to fulfill permit requirements and to be able to operate the system correctly, efficiently and successfully.

1. Return the Influent flow meter to correct and accurate operation; if replacement is needed, consider a mag meter for a gravity operation (this could be tied into a panel upgrade).
2. Repair or replace the 3 way bypass valve to be functional (may want to relocate so that the bypass volumes can also be measured for system management and reporting).
3. Augment the screening of the Influent in some way; install a blend/modulation tank in advance of the recirc tank with multiple, serviceable screens (effluent filters), install a "catch bucket" below the inlet pipe or use a heavy duty pump vault with removable screens with floors to be serviced daily, install a bank of SimTech in line filtrate filters on the pump pressure lines (may create head loss and pump performance issues), or .....replace all effluent filters and pump screens with OSI Biotube type, add where absent.
4. Repair the issues with the middle recirc pump, no. 2., and calibrate the 3 pumps for GPM.
5. Remove all vegetation on the recirc filter, including a clear zone of 10' around the perimeter, removing all trees and brush within 20' area.
6. Redo the piping and distribution network at the recirc filter to be more effective and more serviceable, utilizing zoning, if possible, head and end valving, orifice shields or alternate coverage coverage' including leveling of the existing aggregate and additional as needed.
7, Clean the splitter basin, adjust the weir for accuracy and make the divider component serviceable and adjustable.
8. Restore the dosing siphons to function correctly, including the function of the event counter and high level alarm.
9. Test the operation of the 2 solenoid valves including their controls.
10. Test and balance the distribution within the drainfield cells, including the functioning of the valves; this could involve needing to service the LPD laterals.
11. Test and confirm operation of the control panel with emphasis on the timers function and accuracy and establish the method of adjustment; include checking operation of the float controls in the recirc tank.
12. Address the issue of operation at the UV unit related to the dosing siphon bypass and the cycling control and solenoid valves.
13. Install means of Influent filtration on the bypass line from the recirc tank to the drainfield; also, baffle the bypass outlet located inside the recirc tank and plumb so it cannot overflow scum out to the drainfield

The following are some recommended improvements for consideration, only (not critical).

14. Install a 2 way clean out or other to grade for visual observation of the gravity bypass, including access to the back flow valve.
15. Install a monitor, using a float and meters, which record when and how long the tank is in gravity bypass mode; and, add a manual valve on the pipeline for operator control.
16. Install an event counter on each of the bypass and UV related solenoid valves.
17. Adjust the plumbing of recirc pump no. 2 to be able to use it to dewater the recirc tank directly to the dose tank or drainfield; or provide a separate fixed or portable pump and pipeline for this purpose (located in pump zone or plumbed such that cannot transfer sludge in process).
18. Upgrade the control panel to newer features with programmable timing.....incorporating the controls, recordings etc. for Influent flow, the dosing siphons, UV, solenoid valves etc.; consider remote monitoring (OSI TComm).
19. Convert the water hose bibs to upright commercial grade freeze proof type at the recirc tank and recirc filter / dose tank.
20. install at the upper and lower interfaces, visual monitor stations, inside the recirc filter;

plus provide test points for the distribution network (squirt height or pressure reading).
21. Water jet and power flush the laterals of the drainfield and pressure clear the orifices (access is restricted and improving to grade would conflict with sports field use and safety).

Dan Bush

Appendix E: Summary of DEQ Correspondence

1998 – July 2012

Appendix E summarizes and assembles in chronological order, all DEQ/City documents and correspondence between the 1998 Wastewater Facilities Plan and July 2012.

Jul 28, 1998 Letter to Bill Ewing (Falls City, City Admin) - from DEQ

Summary: Notice of noncompliance, failing subsurface system. On July 1, 1998 citizen reported sewage on the football field. July 2, 1998 DEQ representative conducted an onsite investigation and found claim to be true (Class I Violation). DEQ gave until August 15, 1998 for the city to hire a professional to assess and have a plan for the drain field. Failure to do so will result in formal enforcement action being taken.

Apr 16, 2001 Letter to Mayor Ginger Lindekugel (Falls City) - from DEQ

Summary: Letter amendment#1 to Mutual Agreement Order (MAO). Amendment eliminated paragraphs stating that the Fairoaks pump station had to be eliminated and extended the due date for the Wastewater Facilities Plan from February 28, 2001 to April 30, 2001 for review. The letter stated that 32 septic tanks were dug up and discovered that 60% had major tank/pipe separation. Repairs were made to all tanks that fed the Fairoaks pump station (Ferncos, Riser T's, Pipe bedding).

Apr 27, 2001 Letter to Falls City - from DEQ

Summary: DEQ approved plans for the Valstez Heights Sanitary Sewer pending DEQ construction inspection, manhole testing, mh testing after all surfacing is complete and color TV testing.

June 4, 2001 Letter to Rick Hohnbaum (Falls City, City Admin) - from DEQ

Summary: Domestic Wastewater Solids Management Plan Addendum #2. Addendum changes septic tank pumping from every two years to every four years.

Sep 14, 2001 Letter to Rick Hohnbaum (Falls City, City Admin) - from DEQ

Summary: Letter states that DEQ met with Bob Young and Don Poe on September 13, 2001 to perform a water quality inspection. Wastewater was surfacing on the north end of drainfield A3, the wastewater had seeped into the ground by the morning of September 14, 2001.

Nov 13, 2001 Letter to Tim McFetritch (DEQ) – Rick Hohnbaum (Falls City)

Summary: Falls City wastewater study issues. Numerous questions for DEQ about the wastewater study for preparation in an upcoming public meeting. Five alternatives for treatment options attached.

Dec 3, 2001 Letter to Mayor Ginger Lindekugel (Falls City) - from DEQ

Summary: Mutual Agreement and Order (MAO) Amendment #2 changes the final Facilities Plan due date from December 4, 2001 to February 15, 2002 to allow for the city to get more public input.

Feb 19, 2002 Letter to Rick Hohnbaum (Falls City, City Admin) - from DEQ

Summary: DEQ has received the Final Draft of the Wastewater Facilities Plan (Wallis) and request that six changes be made.

Apr 22, 2002 Letter to Tom Fisher (DEQ) - from Darla Williams (Falls City, City Clerk)

Summary: The city requested an amendment to change their current Sludge Management plan to list American Rooter as their current pumper/hauler.

May 8, 2002 Letter to Mayor Ginger Lindekugel (Falls City) - from DEQ

Summary: Mutual Agreement and Order (MAO) Amendment #3 changes the final Facilities Plan due date from February 15, 2002 to August 31, 2002 to allow for the city to get more public input.

May 13, 2002 Letter to Mayor Ginger Lindekugel (Falls City) - from DEQ

Summary: Letter states that DEQ received the Wallis report and is concerned about justification for alternative selection. If the city intends to fund the project through grants or low interest loans the city will have to better justify their decision for alternative selection.

Jun 19, 2002 Letter to Tim McFetritch (DEQ) – from Rick Hohnbaum (Falls City, City Admin)

Summary: Notice that the city replaced the supply line from the Fairoaks pump station to the manhole located at STA 6+49 on Prospect St. The city also enclosed as-built plans and material specifications.

Sept 23, 2002 Letter to Don Poe (Falls City, PW) - from DEQ

Summary: Letter stating that an onsite inspection of the plant was completed on September 20, 2002 and no violations were reported. Copy of inspection form enclosed.

Sept 25, 2002 Letter to Mayor Ginger Lindekugel (Falls City) - from DEQ

Summary: Letter states that the City of Falls City Facilities Plan [FP] have an amendment in the form of a letter that states how the city will fund the selected alternative in the plan.

Dec 9, 2002 Letter to Donald Poe (Falls City, PW) - from DEQ

Summary: Notice of noncompliance, NPDES Permit Effluent Limit Violations. August 2002 Discharge Monitoring Report (DMR) showed effluent limits were exceeded in one area (TSS) (Class II Violation). The DMR was also submitted late (six days) (class III Violation). There was a warning that only three class II violations may occur within 36 months on the same permit.

Sept 5, 2003 Letter to Tim McFetritch (DEQ) - Don Poe (Falls City, PW)

Summary: Don Poe stating that Falls City exceeded BOD5 limit in July 2003.

Sept 5, 2003 Letter to Falls City - from DEQ

Summary: Letter states that over the next 12 months the DEQ is focusing on issuing permits from their backlog and less on its Discharge Monitoring Reports (DMR). DEQ still wants violations sent to them during this time.

Sept 16, 2003 Letter to Donald Poe (Falls City, PW) - from DEQ

Summary: Notice of noncompliance, NPDES Permit Effluent Limit Violations. July 2003 Discharge Monitoring Report (DMR) showed effluent limits were exceeded in two areas (BOD5) (Class II Violation). The DMR was also submitted late (six days) (class III Violation). There was a warning that only three class II violations may occur within 36 months on the same permit.

Dec 10, 2003 Letter to Donald Poe (Falls City, PW) - from DEQ

Summary: Letter stating that an onsite inspection of the plant was completed on November 14, 2003 and there were effluent limit violations for TSS during the month of October. Copy of inspection form enclosed.

Dec 17, 2003 Letter to Donald Poe (Falls City, PW) - from DEQ

Summary: Notice of noncompliance, NPDES Permit Effluent Limit Violations. October 2003 Discharge Monitoring Report (DMR) showed effluent limits were exceeded in three areas (TSS and BOD5) (Class II Violation). It was stated that because of the reoccurring nature of these violations DEQ is referring the violations to the Department of Compliance and Enforcement with recommendations for formal enforcement action.

Jan 12, 2004 Letter to Donald Poe (Falls City,PW) - from DEQ

Summary: Notice of noncompliance, NPDES Permit Effluent Limit Violations. November 2003 Discharge Monitoring Report (DMR) showed effluent limits were exceeded in five areas (TSS) (Class II Violation). It was stated that because of the reoccurring nature of these violations DEQ may refer violations to the Department of Compliance and Enforcement with recommendations for formal enforcement action.

Feb 2, 2004 Letter to DEQ – from April McClure (Falls City, City Admin)

Summary: Suggest amendments to the MAO changing the draft plan due date for the Collection System Evaluation (CSE) from February 1, 2004 to March 1, 2004, as well as, final plan due date for the CSE from October 31, 2005 to October 31, 2006 and the TSS and BOD5 concentration limits be changed from 30 mg/L to 40 mg/L (monthly average) and from 40 mg/L to 50 mg/L (weekly average).

Mar 1, 2004 Letter to Tim McFetridge (DEQ) - from April McClure (Falls City, City Admin)

Summary: April states that the City has not been able to consistently meet the limits for BOD and TSS and request "this "DRAFT" work plan to move forward to consistently achieve limitations set forth in MAO". She goes on to say the City will TV all sewer lines beginning in March 2004 and document all I/I until May 28, 2004. The City will also locate and document clean outs along the way and fix concerned areas. The City will Re-TV the sewer line from October 2004 until December 2004. And after all of this has been completed and the City is still out of compliance they will move forward to get a new sewer facility.

Mar 12, 2004 Letter to April McClure (Falls City, City Admin) - from DEQ

Summary: Letter states that DEQ has received the draft Collection System Evaluation Plan (draft CSE). The City needs to confirm that the final CSE will be provided no later than 3 months after completion of the CSE work and that the MAO requires that all practicable I/I sources be removed by October 31, 2006.

Mar 31, 2004 Letter to April McClure (Falls City, City Admin) - from DEQ

Summary: Mutual Agreement and Order (MAO) that was negotiated was signed and is now a fully executed document. DEQ enclosed a copy of the MAO.

Nov 2, 2004 Letter to Tim McFetridge (DEQ) - from Don Poe (Falls City, PW)

Summary: Don lists 15 possible I&I causes. Don also states that approximate 75% of the sewer line has been TVed and no joint separation has been spotted; however, inspection has shown low points. Don states plans to readdress problem during wet season to find possible leaks.

Jan 4, 2005 Letter to Don Poe (Falls City, PW) - from DEQ

Summary: Letter stating that an onsite inspection of the plant was completed on December 30, 2004, no violations reported. Copy of inspection form enclosed.

Jan 28, 2005 Fact Sheet and NPDES Permit Evaluation

Summary: Review of the last NPDES permit (expiring Jan 31, 2005). Review included; Facility description, Biosolids Management and Utilization, Inflow and Infiltration (I/I), Outfalls, Receiving Streams/Impact, Antidegradation Review, Temperature, Groundwater, Stormwater, Compliance History and a thorough discussion of each schedule of the new permit.

> Inflow and Infiltration (I/I) – stated that the city has not successfully corrected deficiencies and will need to submit a plan and schedule within one year of the new permit issuance on-going replacement of existing system, as well as, an annual report on I/I reduction activities.

Antidegradation Review – Environmental Quality Commission (EQC) performed the review and determined that the Little Luckiamute River is a High Quality Water during the winter months.

Temperature – EQC performed a calculation and found that the discharge should not raise the temperature more than 0.3°C above the numeric criterion. The ODF&W also performed a review and found temperature requirements to be satisfactory.

Groundwater – Low potential for impacting groundwater quality (no groundwater evaluations required).

Compliance History - Five Class II violations listed during current permit. City entered into a MAO in 2004 to address I/I. MAO terminated on May 21, 2007 and the city now has to meet all limitations set by the NPDES permit.

Apr 22, 2005 Letter to April McClure (Falls City, City Admin) - from DEQ

Summary: Drought conditions expected during the summer months so DEQ came up with a plan to minimize impact on the watershed by reviewing maintenance records and ensure facilities is operating efficiently as possible, avoid power outages that may affect the treatment facility and monitor flow conditions into fall and winter. The letter was a generic reminder.

Nov 6, 2006 Letter to April McClure (Falls City, City Admin) - from DEQ

Summary: Letter stating that the EPA has presented a report to congress about Sanitary Sewer Overflows (SSOs) and that the DEQ will have to implement the suggested changes by the EPA if approved. DEQ also needs to implement the States wet-weather SSO policy. By January 1, 2010 the city must comply with the winter SSO, including a plan for the city to reduce the I&I occurring.

Dec 28, 2006 Letter to Don Poe (Falls City, PW) - from DEQ

Summary: Letter stating that an onsite inspection of the plant was completed on December 27, 2006 and that the UV disinfection was not working properly and flows in excess of Schedule A limits were sent to the drainfield (Class II Violation). Copy of inspection form enclosed.

Feb 26, 2007 Letter to Timothy McFetridge (DEQ) - from Don Poe (Falls City, PW)

Summary: Don states that the existing MAO has not been working for the city and they are unable to find the I&I problem. Don states that he believes the problem is with the whole system and requests a meeting with the DEQ to discuss future permits.

May 21, 2007 Letter to Keith Moes (Falls City) - from DEQ

Summary: Letter stating that the MAO is terminated and that DEQ is working on renewing the Cities NPDES permit. Also, DEQ is looking at changing the manner the Cities effluent discharge is regulated. So that from November 1st to April of each year the City could have continuous UV treated discharge into Little Luckiamute River. DEQ also states that minor repairs and maintenance is required to the UV system before November 2007.

Jun 21, 2007 Letter to Don Poe (Falls City, PW) - from DEQ

Summary: NPDES Permit Draft – Applicant Review – NPDES Permit enclosed for review.

Jun 26, 2007 Letter to Timothy McFetridge (DEQ) - from Keith Moes (Falls City)

Summary: Letter states that the City Council adopted the 2007-2008 budget which includes funds to replace UV lights, repair the backup pump motor, modify the electrical system to help prevent loss of a pump that had occurred due to improper phase protection and to upgrade the control panel for improved system operation.

Aug 8, 2007 Letter to DEQ – from Keith Moes

Summary: Don Poe suggests excluding "concentration BOD TSS 30 weekly, 20 monthly and loading BOD TSS daily 8.8, weekly 6.6, monthly soil absorption filed in the new permit"

Aug 16, 2007 Letter response to Keith Moes - from DEQ

Summary: Permit review comments – The concentration and mass load limits for BOD5 and TSS when discharging to the soil absorption drain field shall not apply. However, the permit still requires that the City continue to monitor when discharging into the drain field.

Dec 19, 2009 Letter to Tim McFetritch (DEQ) - from Don Poe (Falls City,PW)

Summary: Don Poe stating that Falls City exceeded monthly average TSS loading of 4.4, actual results 4.7.

Feb 2, 2010 Letter to Leah Koss (DEQ) – from Mary Pfauth (DEQ)

Summary: The DEQ sent Falls City the wrong DMR forms which did not have a pre-printed column for pH so Falls City is not at fault for not sending pH results from July 2006 to Feb 2010. Mary Pfauth recommends sending a warning letter to Falls City.

Mar 31, 2010 Warning letter to Mayor Darrin Fleener (Falls City) - from DEQ

Summary: Letter warning that the November 2009 discharge monitoring report (DMR) exceeded its permitted monthly average limits for Total Suspended Solids (TSS). City reported a monthly average of 4.7 lbs which is greater than the 4.4 lbs maximum allowed. No formal action taken by DEQ.

Apr 26, 2010 Warning letter to Mayor Darrin Fleener (Falls City) - from DEQ

Summary: Letter warning that the December 2009 discharge monitoring report (DMR) included no pH monitoring had been completed since June 2006 (Class I Violation). A review was completed and found that Falls City has always been within pH limits so it is unlikely that the violation caused significant environmental harm, therefore no formal action taken by DEQ.

Jul 6, 2010 Warning letter to Mayor Darrin Fleener (Falls City) - from DEQ

Summary: Letter warning that the April 2010 discharge monitoring report (DMR) exceeds Total Suspended Solids (TSS) limits specified by the NPDES permit .City reported a TSS daily effluent load of 9.2 lbs which is greater than the 8.8 lbs maximum allowed (Class III Violation). No formal action taken by DEQ.

Dec 22, 2010 Letter to Don Poe (Falls City, PW) - from DEQ

Summary: Instructions on the revised Internal Management Directive (IMD) regarding Sanitary Sewer Overflows (SSO).

Feb 1, 2011 Letter to Gian Paolo Mammone (Falls City, City Admin) - from DEQ

Summary: Permit Renewal Application Data Needs: pH study and mixing zone and/or dilution study.

Aug 30, 2011 Response letter to Don Poe (Fall City, PW) - from DEQ

Summary: Don contacted DEQ on August 26, 2011 after overwatering of football field with concerns for players' safety. DEQ suggest that it is safe to play football on the field after a water sample was taken and two lime treatments were applied to the field.

Appendix F: Record of Drainfield Surface Water Incident Aug-Sept 2012 and Aug 2011

August 25, 2012 Water was discovered on the drainfield surface. The following correspondence was exchanged:

John McGee

From: Admin [admin@fallscity.org]
Sent: Tuesday, August 28, 2012 8:55 AM
To: 'John McGee'
Subject: RE: Drainfield failure

Thanks John,

I have arranged for the staff to be available to you.

Amber Mathiesen, CMC
City Administrator
Falls City, Oregon

☎: 503.787.3631 | 🖷: 503.797.3023 | ✉: admin@fallscity.org

DISCLOSURE NOTICE: Messages to and from this e-mail address may be subject to the Oregon Public Records Law.

From: John McGee [mailto:johnmcgee@jdmcgee.com]
Sent: Tuesday, August 28, 2012 8:53 AM
To: 'Admin'
Subject: RE: Drainfield failure

Hi Amber,

Dan Bush will be on site about noon, after a meeting in Oregon City. I will probably show up around 11:30 to set up my RTK GPS base station, then I will come to City Hall to check in and then to the drainfield to survey the effluent surfacing area and meet Dan.

Hopefully the boys will intercept me somewhere along those paths.

Thanks,

John

John McGee, PE, PLS, CWRE
JD McGee, Inc.
PO Box 1472
Philomath, OR 97370
Phone: (541) 929-4226
Fax: (541) 929-4227
Email: johnmcgee@jdmcgee.com
Website: www.jdmcgee.com

156

John McGee

From: Daniel Bush [septech@mac.com]
Sent: Wednesday, August 29, 2012 6:34 AM
To: John McGee
Subject: Falls City DF

From our inspection, noted the following.

The siphon system has not been functioning correctly. This is because the siphon to the B cells is out of order for some reason related to maintenance of the air volume below the siphon bell.
As a result the distribution of treated effluent flow has been predominately going to the B cells. This is because the B siphon has been "trickling" resulting in gravity flow to the cells at rate nearly equal to the inflow volume of treated effluent to the dose tank.
This would contribute to explain the observation of a near saturated trench found in the exploration of cell B2. At the reported current flows of 20K, this cell ought to have received approximately 2860 gals per day in a little over 3 doses total at around 865 gals per dose.
The constant flow of effluent into a pressure distribution system does
2 things; first it defeats the purpose of intermittent dosing to allow the liquid to be processed by the soil, for which the distribution was intended to overcome soil limitations and second, it can result in accelerated clogging of the orifices which further defeats the effort of equivalent distribution along the length of a trench, also intended to overcome soil limitations or characteristics.
Two (2) things appears really important to be done.
First, pump and clean (thoroughly) the drainfield dose tank, measure the interior for exacting calibration, prime the siphons and test the operation of both; if B does not perform, then it needs to be evaluated for repair.
Second, repair the existing or install a new device to measure flows, needed for any accuracy in operating the system, now even more critical given the conditions within the drainfield; this improvement will be applicable to any upgrade or replacement done to the overall system, so it would not become wasted dollars from the system budget.

I think full disclosure of the situation/event, the actions taken for mitigation and the planned reuse of the field for athletics is good policy on the part of the City and School District. In this regard the involvement of the DEQ in that decision process is likely legally and politically important.

Don Bush.

1

John McGee

From: Daniel Bush [septech@mac.com]
Sent: Wednesday, August 29, 2012 5:28 PM
To: John McGee
Subject: Falls City DF Construction

John.
By the limited information we have, it would appear the drainfields were constructed deeper than was permitted.
On that basis, it becomes even more important (imperative) to have the ability to monitor, manage distribution and know flows accurately.
Suggest that once it is feasible, we locate by excavation the four (4) corners of each field, locate and record the elevation of the piping, install monitor stations into the trenches at 2 points at opposite ends of each cell and conduct a complete topographic map of the drainfield area.
Also, install 1 or more simple groundwater monitoring wells on the property but outside the total drainfield, one of which ought to be in line with the calculated groundwater flow (riverside).
With all this we will know exactly (and can map) where things are at, will be able to monitor cells operation (and groundwater influence / affect) and calculate (without further excavation or investigation) exactly where and how deep the trenches are.
This will be very beneficial to understanding and managing the drainfields given the flows issue and the continued use of the rgf system.
Just a thought.
Dan Bush.

1

John McGee

From: John McGee [johnmcgee@jdmcgee.com]
Sent: Wednesday, August 29, 2012 8:23 PM
To: Amber Mathiesen
Cc: 'Daniel Bush'; 'Admin'; Houghtaling, Amy (Mayor)
Subject: Drainfield - Surface water issue
Attachments: Drainfield B2 monitoring station location sketch 8-28-2012.pdf

Hi Amber,

This email is intended to summarize our meeting on-site at the drainfield yesterday (August 28, 2012).

Situation:

Water was discovered standing on the surface of the ground in the area above drainfield cell "B2" Saturday morning, August 25, 2012. The drainfield, including the area where surface water was observed, is part of the High School football field. In keeping with the City's NPDES permit, the City notified DEQ, powdered-lime was applied to the subject area, and the area was cordoned off using orange traffic cones and a single strand of yellow caution tape.

At 3:08 PM, Monday, August 27, 2012, you called me to invite me to a meeting Tuesday, August 28, 2012. I called Dan Bush to arrange for him to attend the meeting and to help discern the cause of the water.

The on-site meeting took place Tuesday from about 12 PM to about 6:30 PM. Attendees for part or all of the meet included:
Amy Mathiesen, City Administrator
James Walton, Public Works (PW)
Don Poe, PW
Carl (Corky) Wagner, PW
John McGee, City Engineer
Dan Bush, Envirotech Northwest, Inc.

Discussions:

Poe – Recommended replacing the dosing siphons with new dosing siphons. DEQ records indicate that the dosing siphons have malfunctioned previously (1998) and it was noted last spring that the siphons were not working correctly.

McGee – Physics suggest that since drainfield cells are interconnected with 8" pipe, presumably installed at the same elevation, then the water level in all connected cells is at the same elevation.

General discussion – The High School (HS) has been irrigating (hand lines with sprinklers were in operation during part of the meeting). Pipe impressions and dead grass where pipe had resided for some time were evident in the subject area.

Wagner – The HS watered the subject area Thursday, August 23 – duration of irrigation was unknown.

General discussion – A sample hole had been hand excavated to a depth of approximately 12" below the surface by PW on Sunday. No water was visible during the Tuesday-meeting. Reportedly, no water was visible during excavation on Sunday.

Poe – PW changed the control valve that isolates cell B2 during the fall of 2008. That valve was closed from the time of installation until August, 2011. The valve remained open from August 2011 until Saturday, August 25, 2012, when it was closed in response to the surface water situation.

Findings/Discoveries/Conclusions:

1

McGee – Set up RTK GPS base station on existing control and conducted a utility location survey. Shot drainfield cell control valve locations as pointed out by PW. Shot the perimeter of the subject ponded-water area.

McGee – Reviewed sprinkler configuration and researched design flows. The FCHS's system has 18-sprinkler heads capable of delivering 124 to 216 gallons per minute to the field, depending on system pressure. By field measurement, the irrigated strip is approximately 64 feet wide by 401 feet long (25856 SF). If the system runs for 1-hour it is expected that 0.5" to 0.8" of water would cover the entire irrigated area, assuming that there were no other leaks. Leaks in the flexible transmission pipe were observed, and ponding (off the field) did occur. The start and stop time of irrigation prior to the discovery of the surface water is unknown.

McGee/Bush – Measured the distance between existing drainfield cell control valves (B2 to A3) using a cloth 100-ft tape. The measured distance was 95-ft. The distance shown on the "RECORD DRAWING JAN, 1986" is 95-ft.

PW/Bush – Excavated a small trench on the north side of the football field perimeter-track to find a drain line. One line was discovered 48-inches below the surface. The "RECORD DRAWING" lists the depth to pipe at 12"-36" plus 6" (so 18"-42"). The soil composition was determined not to be native for this specific site. The silt-clay-loam fill can be found in Falls City, but would not be found at this specific location according to the USDA Polk County Soil map. Soil was damp to wet as the depth of hole reached the drain pipe. A sketch of the excavation site location is attached to this email.
Conclusion: The Engineer of record was not retained to inspect the work done in the first phase of the sewer system construction (believed to have been an effort on the part of the City to save money). It is not known whether anyone from the City inspected the contractor's work. Since the Engineer did not inspect or watch the construction, he could not have created "AS-BUILT" drawings, because he did not see what was built. It is speculated that the Engineer used the term "RECORD DRAWING" to indicate that these drawings are the best evidence available to him, which might not have actually been constructed. It may be the case that the football field was constructed on top of the finished drainfield, or it could be that the contractor installed the lines too deep. Bush/McGee recommended that PW install a vertical monitoring pipe (4" ASTM D-3034 with slots cut in the lower 12"), plugged, and covered with some sort of control valve box.

Bush/PW – Test flowed the dosing system by quickly filling the dosing tank. Siphon "A" operated once as a siphon is expected to operate. Siphon "B" is in "trickle" mode. Review additional comments from Bush below.
Conclusion: The dosing tank needs to be pumped and cleaned well. Dosing siphon "B" should be evaluated and repaired or replaced.

Bush/McGee – The key to Falls City's system is the drainfield. Without the drainfield, Falls City has no system. We do not know much about how well the drainfield is functioning. Now that one line has been discovered 4-feet below the surface, we are speculating that some drain lines may be 5 or more feet below the surface. PW says that a 4-foot long valve wrench handle is too short to reach the valve nut, which seems to support this speculation.
Conclusion: The way to obtain data on drainfield is to install monitoring ports as described by Bush in the email copied into this email below. Timing of monitoring port installation should not conflict with FCHS use of the field.

SUMMARY and RECOMMENDATIONS: We did not discover conclusively the source of the standing water. Even if the standing water was directly attributed to the irrigation operations, there is no way to determine if the irrigation water came in contact with effluent. As a result and in the interest of public health and safety, it is my professional opinion that the subject area cannot be opened to the public for use until DEQ says it is safe (reportedly 2-weeks, based on PW comment).

It is also my professional opinion that a single strip of yellow caution tape does not create a barrier to keep the public out. In fact, we all watched a couple walk over the tape. I recommend installation of orange contractor fence or similar barrier so that it is clear that pedestrians should not enter. In addition, all supervisory personnel should be warned that athletic equipment such as footballs, etc. that enter should be disinfected before reuse.

It is not clear what type of lime was used. We recommend reapplying, using hydrated lime, and keep records of the application. At a minimum the date/time/density of coverage and photos should be taken to document the application. Take photos of the product container (bag) and videos of the application procedure, if possible. Submit a written report to DEQ and the City Engineer with a copy of all photos and videos.

2

As mentioned previously in this email, I have copied in two emails I received from Dan. They follow my signature block. Please also review and consider them.

Thanks,

John

John McGee, PE, PLS, CWRE
JD McGee, Inc.
PO Box 1472
Philomath, OR 97370
Phone: (541) 929-4226
Fax: (541) 929-4227
Email: johnmcgee@jdmcgee.com
Website: www.jdmcgee.com

From: Daniel Bush [mailto:septech@mac.com]
Sent: Wednesday, August 29, 2012 6:34 AM
To: John McGee
Subject: Falls City DF

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Dan Bush.

3

John.
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This will be very beneficial to understanding and managing the drainfields given the flows issue and the continued use of the rgf system.
Just a thought.
Dan Bush.

4

John McGee

From: Admin [admin@fallscity.org]
Sent: Friday, August 31, 2012 12:28 PM
To: 'John McGee'; 'Daniel Bush'
Cc: 'Houghtaling, Amy (Mayor)'
Subject: RE: Falls City Football Field

I spoke with Tim McFettridge (spelling uncertain)with DEQ. We have a few options however 2 are not likely to be approved by DEQ.

1. Apply for a permit modification for year round discharge to the river.
Tim indicated this was unlikely to be approved due to the flow rate of the river itself along with us having other options to exercise first (see below), as well as several other restrictions they must enforce (not sure what these are exactly).

2. Apply for an out of season discharge
Tim indicated we do have an allowance in our permit for this if approved in writing by DEQ. He said this would not be approved unless we had a complete failure of the system and no other options for discharge.

3. Apply for a special discharge permit
This would allow us to use the water to be used for farm field irrigation if we could find a site to pump the water such as a field, or the cemetery.

Any of these options have an application process and fees associated. Tim's suggestion was to keep operating as we are until we believe a complete failure is eminent or has occurred.

Amber Mathiesen, CMC
City Administrator
Falls City, Oregon

P: 503.787.3631 | F: 503.787.3023 | E: admin@fallscity.org

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-----Original Message-----
From: John McGee [mailto:johnmcgee@jdmcgee.com]
Sent: Friday, August 31, 2012 8:26 AM
To: 'Daniel Bush'
Cc: Amber Mathiesen ; Houghtaling, Amy (Mayor)
Subject: RE: Falls City Football Field

Dan,

I agree with everything you've said. I will call Amber right now and ask for authorization to contact DEQ.

John McGee, PE, PLS, CWRE
JD McGee, Inc.

PO Box 1472
Philomath, OR 97370
Phone: (541) 929-4226
Fax: (541) 929-4227
Email: johnmcgee@jdmcgee.com
Website: www.jdmcgee.com

-----Original Message-----
From: Daniel Bush [mailto:septech@mac.com]
Sent: Friday, August 31, 2012 5:59 AM
To: John McGee
Subject: Falls City Football Field

John.

The City had another saturation experience in the football field, yesterday.
I was called and asked to evaluate the situation and their actions.
This time the saturation is in the area of cell B3; the same area had issues a year or 2 back, which had been off line until recently, and, in the same vicinity where we noticed standing irrigation water at the inspection on Tuesday.
With this event, they had closed off the field, posted the property, collected effluent samples for coliform, limed both problem areas and closed all valves to the B drainfield cells.
Football practice was moved, there will be no game here this week, in fact, no use until the matter is rectified.
The dosing system is now working correctly, but off of A siphon only, meaning all flow, 26K Thursday, is going to half the drainfield.
The pumping, cleaning and testing of the dose tank is being scheduled.
An initial evaluation suggests it is trapped irrigation water, but exploratory holes dug in the vicinity filled with liquid and have remained so; additional borings outside the saturated area found more favorable conditions until 18" of depth where restrictive matter, rock and saturation were encountered making conditions suspicious.
Given the history of the location, the recent experience with cell B2, the time of year and knowledge of the distribution issues, coupled with the historical I&I issues affecting flows, believe it was best to error on the side of caution and to restrict use of the field until further notice.
On the chance the coliform samples come back elevated, I collected samples for Ammonia and Nitrate from the surface water for further analysis; these elements should not be present if the liquid does not contain effluent from the drainfield.
If memory serves me right, believe the DEQ offered or entertained the idea recently of going to full time stream discharge. If the findings confirm the saturation is from the drainfield, think this is an avenue that should be pursued.
Did advise the City that no matter what it is time to investigate the drainfield as proposed by excavating the 4 corners of each cell, taking the trench measurements, topoing the field, installing monitoring stations internal and external, making sure the valves are functioning correctly, and get the B siphon functional.
If the siphon issue cannot be corrected, then may need to consider a valve system (8 to 12" dia.) on the outside of the dose tank in which the discharge from the the single good siphon can be alternated between the 2 fields; this would mean manual valve manipulation daily.
Coupled to this there needs to be an accurate way of measuring flows and monitoring the functioning of the siphon. We checked and did not find any counters for the siphons; the 2 floats in the vault must relate to another function or are no longer part of the equation?
If the DEQ is willing to allow full time stream discharge, think we should pursue that in earnest. It takes the sewage question away from the school property for the time being.
But, they should not give the drainfield up.

2

With the effluent diverted, the investigation, maintenance, improvement and any upgrades could be done sooner in order to render the drainfield understood and more adequately manageable.
In this same regard, if the DEQ allows more flow and extended discharge to the stream, this too, should be maintained, even if it means more sampling, redundant tertiary treatment, etc. This is because the drainfield is now 27 years old and its usage in terms of flow and distribution, not to now mention its construction (i.e.
depth, fill, grading...) is contrary to its capacity and design, both of which are a function of the limiting soil characteristics of the site. All drainfields have a limited life, thus the reason for the replacement area requirement, and it could come to pass that we are beginning to experience the signs of aging or wear and tear; hopefully not, but it will happen sooner or later.
My recommendation is to pursue the stream alternative if at all possible as soon as possible.

Dan Bush.

3

John McGee

From: Admin [admin@fallscity.org]
Sent: Tuesday, September 04, 2012 11:10 AM
To: 'John McGee'
Cc: 'Daniel Bush'
Subject: RE: Falls City Football Field

I think at this point we are thinking we will be doing quite a bit of digging to locate the trenches and create monitoring stations. Meanwhile the staff had an appointment today with a pumper to evaluate if he could clean the siphon box so we can move forward with Dan's suggestion of cleaning, testing and attempting to reprime the siphon to get the dosing to work.

Amber Mathiesen, CMC
City Administrator
Falls City, Oregon

P: 503.787.3631| F: 503.787.3023 | E: admin@fallscity.org

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-----Original Message-----
From: John McGee [mailto:johnmcgee@jdmcgee.com]
Sent: Tuesday, September 04, 2012 9:25 AM
To: 'Daniel Bush'; 'Admin'
Subject: RE: Falls City Football Field

I agree with everything Dan said.

I might even suggest that we dig down to the end of one of the "A" cells to take a sample for Nitrate testing. This is just a thought, but if the Nitrate concentration was similar at the end of one of the distribution pipes, that would reinforce the surfacing effluent claim. I am not married to this idea; just a thought...

John McGee, PE, PLS, CWRE
JD McGee, Inc.
PO Box 1472
Philomath, OR 97370
Phone: (541) 929-4226
Fax: (541) 929-4227
Email: johnmcgee@jdmcgee.com
Website: www.jdmcgee.com

-----Original Message-----
From: Daniel Bush [mailto:septech@mac.com]
Sent: Friday, August 31, 2012 7:31 PM
To: Admin
Cc: John McGee
Subject: Re: Falls City Football Field

1

Received labs for samples collected yesterday evening.
Ammonia came back not detectable.
Nitrate came back at 3.5 mg/L, that is unusual since the irrigation came from a surface supply, the river, therefore unless it contains this level of nitrate or more, this result would tend to indicate effluent presence.
What we should do, I believe, is keep the field closed, resample any liquid present and do the same for the system effluent and for the content of the river to affirm the 1st results; Ecoli, Fecal Coliform, Ammonia and Nitrate.
Dan Bush.
On Aug 31, 2012, at 12:28 PM, Admin wrote:

> I spoke with Tim McFettridge (spelling uncertain)with DEQ. We have a
> few options however 2 are not likely to be approved by DEQ.
>
> 1. Apply for a permit modification for year round discharge to the
> river.
> Tim indicated this was unlikely to be approved due to the flow rate
> of the river itself along with us having other options to exercise
> first (see below), as well as several other restrictions they must
> enforce (not sure what these are exactly).
>
> 2. Apply for an out of season discharge
> Tim indicated we do have an allowance in our permit for this if
> approved in writing by DEQ. He said this would not be approved unless
> we had a complete failure of the system and no other options for
> discharge.
>
> 3. Apply for a special discharge permit
> This would allow us to use the water to be used for farm field
> irrigation if we could find a site to pump the water such as a field,
> or the cemetery.
>
> Any of these options have an application process and fees associated.
> Tim's suggestion was to keep operating as we are until we believe a
> complete failure is eminent or has occurred.
>
>
> Amber Mathiesen, CMC
> City Administrator
> Falls City, Oregon
>
> P: 503.787.3631| F: 503.797.3023 | E: admin@fallscity.org
>
> DISCLOSURE NOTICE: Messages to and from this e-mail address may be
> subject to the Oregon Public Records Law.
>
>
>
>
>
> -----Original Message-----
> From: John McGee [mailto:johnmcgee@jdmcgee.com]
> Sent: Friday, August 31, 2012 8:26 AM
> To: 'Daniel Bush'
> Cc: Amber Mathiesen ; Houghtaling, Amy (Mayor)
> Subject: RE: Falls City Football Field
>

John McGee

From: Daniel Bush [septech@mac.com]
Sent: Tuesday, September 04, 2012 3:06 PM
To: John McGee
Cc: Admin
Subject: Re: Falls City Football Field

As discussed with Amber today, excavations between ends of cells need to be independent, meaning no trench to expose 2 at a time, so that one cell cannot then drain directly into the other, that would defeat the ability to mange the cells.
And, yes, the topo survey would follow the excavations so that the pipe elev.'s can be measured and then used to compute trench elevations and depths (note, the trench bottom is 6 to 8 inches, should be in plans, below the top of the 2" pressure pipes, that would be the actual trench elevation by which to compare to the ground surface.
Would recommend the topo include all the field so we can determine drainage patterns for irrigation and the trenches.
Dan Bush

Sent from my iPad

On Sep 4, 2012, at 11:55 AM, John McGee <johnmcgee@jdmcgee.com> wrote:

> I think it makes sense to wait on the topo survey until we have as many valves and access ports as practicable available to shoot along with the topography. That way we get the best possible picture of what was actually installed. Do you have a sense as to when the accesses will be excavated?
>
> John McGee, PE, PLS, CWRE
> JD McGee, Inc.
> PO Box 1472
> Philomath, OR 97370
> Phone: (541) 929-4226
> Fax: (541) 929-4227
> Email: johnmcgee@jdmcgee.com
> Website: www.jdmcgee.com
>
>
> -----Original Message-----
> From: Admin [mailto:admin@fallscity.org]
> Sent: Tuesday, September 04, 2012 11:10 AM
> To: 'John McGee'
> Cc: 'Daniel Bush'
> Subject: RE: Falls City Football Field
>
> I think at this point we are thinking we will be doing quite a bit of digging to locate the trenches and create monitoring stations. Meanwhile the staff had an appointment today with a pumper to evaluate if he could clean the siphon box so we can move forward with Dan's suggestion of cleaning, testing and attempting to reprime the siphon to get the dosing to work.
>
> Amber Mathiesen, CMC
> City Administrator
> Falls City, Oregon
>
> P: 503.787.3631| F: 503.797.3023 | E: admin@fallscity.org

1

John McGee

From: Daniel Bush [septech@mac.com]
Sent: Thursday, September 06, 2012 6:39 PM
To: John McGee
Subject: Re: Falls City Football Field

We worked on the siphon issue today.
The tank was purped, but not fully cleaned as I had hoped, nevertheless is much improved.
Entered tank and inspected the siphons, took measurements and photos of things and calibrated the volume as built.
Found no physical issues with either siphon; soap tested the top for air leaks, result was none.
The tank measures 174" square, the inlet is 39" from the floor, the operating point is 41" from the floor, the shortest vent tube is 46"
from the floor and the tank soffit is 75 " from the floor.
The volumes are; 131 gals/inch, 5110 gallons operating volume, 4860 gals per cycle, 5980 gallons volume at overflow and 9825 total maximum gallons capacity.
Note: did find a leak into the tank where the splitter vault was formed and the tank then formed over its common wall, a rough joint there and filtrate was entering the tank; not a problem when the tank level is above the 21" point, will balance out or possibly even flow in reverse into the splitter basin return zone; either way this affects the recirc ratio some; recommend planning to fix at next clean out of dose tank.
Tank refilled with fresh water; experienced trickling at about 2"
below top of siphons; closed valves to drainfield B; took a while to fill pipes, tank then progressed to refill; during time forcibly introduced air under the bells of both siphons at which B acted odd (extended air release via snifter tube; with tank level well above bells, opened all cells to B at which could hear trapped liquid in pipes drain out via air vent, but tank level continued to rise; then, got caught by surprise at about 12" from the normal on level, B siphon activated and quickly drained out to the drainfield cells; the action was very typical of a fully operating siphon; this was the result we hoped for (but, the proof is yet to come).
This all took a while; we elected to allow things to run normally and wait and see what happens next; hope is A cycles then B and then A and so on; staff to monitor tonight before leaving and all day tomorrow; success will be if both remain in siphon mode and alternate.
Got a line on a remote digital battery operated siphon counter; just need to add a float, mounted to one of the 2" vents and make the field connections; issue is where to mount so it does not get vandalized; Don interested, cost is low, they can do install, no electrician needed.
Drainfield area was fully limed with calcium carbonate, today and irrigation restored to introduce lime to soil for treatment and to restore vegetation for sports; the irrigation is now under the control of the City, in which they will operate it on a schedule of 1 hour per sector or less and the heads are now about half as many at around 40'
separation and radius.
With the siphons now, tentatively, active and the irrigation restored, but controlled, the next while will be the test.
Did check the drainfield, all ok, and no water to 48" plus in the excavation at cell B2.
To send City report plus pics., will cc you.

Have another thought to share on the drainfield issue.
What if?
The City takes over the drainfield area completely and builds the School an athletic field on other land in or adjacent the City.
This eliminates the current incompatibility and separates the entities involved.
It greatly reduces the potential for a health hazard since land access could be controlled better (fenced).

1

Perhaps the filtrate could be irrigated at times of the year for treatment and disposal, to enhance the soil and reduce the hydraulic load on the undersized, improperly built and older, challenged drainfield.
Seems this would be cheaper than pumping or hauling to off site lagoons or drainfield etc.
The separation of the public from the system is accomplished. Control is improved. The kids and community benefit from the new facilities (there might be federal grants for athletic endeavors for a rural
school?)
This came to me as I left today and surveyed the large open properties adjacent or near the City along the main road.
Just a thought.

Dan Bush

John McGee

From: Admin [admin@fallscity.org]
Sent: Friday, September 07, 2012 2:02 PM
To: John McGee
Subject: FYI DEQ letter
Attachments: SecondFallsCitydrainfield.doc

Amber Mathiesen, CMC
City Administrator
Falls City, Oregon

☎ 503.787.3631 | 503.797.3021 | admin@fallscity.org

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From: DICKSA Bob [mailto:DICKSA.Bob@deq.state.or.us]
Sent: Friday, September 07, 2012 1:44 PM
To: 'admin@fallscity.org'
Cc: 'love_lynn@fallscity.k12.or.us'
Subject:

Hi Amber here is the letter. I will sign and date the hard copy and put it in the mail today. Thanks, bob.

Robert Dicksa
Senior Water Quality
Permitting Specialist
DEQ-Salem Office
Ph: 503-378-5039

September 7, 2012

Ms. Amber Mathiesen, CMC
City Administrater
City of Falls City
Post Office 160
Falls City, OR 97344

RE: WQ-City of Falls City
NPDES Permit No. 101808
File No. 28830
EPA No. OR 003270-1
Polk County
Drainfield Bacteria

Dear Ms. Mathiesen

On Friday, September 7, 2012, I spoke with you by telephone regarding the issue of the Falls City School District irrigating the high school football field on August 25, 2012 and August 29, 2012, to the point of standing water on the playing surface. Because the high school football field covers the City's wastewater treatment plant sewage drainfield, you asked about the potential health concerns of the football team playing on the field if the treated sewage in the underlying drainfield had contacted the ponding surface water on the playing field. You informed me that the City had taken water samples from soil test pits on the football field and had them analyzed for E. coli Bacteria. The results of the two samples from the North and South side of the field were 686.1 and 150.1 colonies per 100 mL respectively

You asked our Department if the City should allow the School District to conduct a high school football games on the field under these conditions. You also stated that the City had recently applied lime on the field as a precautionary measure.

With regard to the information that the City has presented our Department to date, the Department does not believe that playing on the field would be a concern. However, the Department is not granting approval for use of play on the field as this decision should ultimately be made by the Falls City School District and the City of Falls City.

Finally, Department requests the City of Falls City take the following actions:

- In conjunction with the Falls City School District, manage the amount of water irrigated per hour on the high school football playing field to eliminate future ponding water on the playing surface

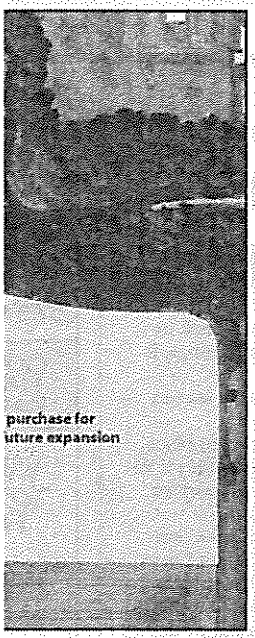
The Department appreciates the City's concerns regarding this matter. If you have any questions or any additional concerns, please me in our Salem office at (503) 378-5039

Sincerely,

Robert Dicksa
Senior Water Quality Specialist

RAD:
x:\shared\rdicksa\SecondFallsCitydrinfield doc

ecc: Ms. Lynn Love, Business Manager, Falls City School District
Love_Lynn@FallsCity.K12.or.us



PETE STRONG/Itemizer-Observer
ase 16 acres of farmland.

) grow

'olk County Fair Board pre-
lts preliminary site master
ring the 2012 Polk County
g. 9-12 and now is looking
lic comment on the plans.
ves them (the fair board)
ortunity to grow the facili-
ay the people in the coun-
it to grow," Hartmann said
otential purchase. "I'm ex-
out it because it is some-
at's needed to be done for
lme."
air board will hold an open
hursday where people can
plans and offer comments
est changes.
e is no immediate plans to
ny fairgrounds operations
at (the sale) area," Pope
ating parking is the only
concern at this time.
farmer has generously al-
he fair to use a few acres
rflow parking after har-
it sometimes the harvest
id the fair's needs don't

more information about
sing for the land purchase
onate: Norbert Hartmann,
-8030.

Field's excess water source: overwatering

By Jolene Guzman
The Itemizer-Observer

FALLS CITY — The pool of water on Falls City High School's football field turned out to be nothing more than a case of too much watering.

The football field was cleared for use and reopened Monday after being closed part of last week, which resulted in FCHS's first scheduled home game of the season Friday night being moved to the opponent's home field.

The field had been closed as a precaution against a possible overflow of the city's sewer drain field, which is located underneath the playing surface. The standing water was discovered on the field in late August.

Test results received on Friday confirmed that no sewage had leaked to the surface.

"All signs indicate that the field was overwatered," said City Administrator Amber Mathiesen.

The city treated the field with lime for a last time as a precautionary measure before reopening it for use Monday.

Falls City's football team played Friday's game at Chemawa in northeast Salem.

Last year — at the same time — a pool of water collecting on the field was identified as a sewer system leak, which closed the field for a couple of weeks while the city corrected the issue.

This time, the city used the same caution.

"We weren't sure if the water was coming from the drain field or from the school district watering the field in preparation for (football season)," Mathiesen said. "We took the conservative approach and closed the field."

Initial tests on the water were inconclusive, so the city decided to conduct another series of tests to make sure treated water running through the drain field wasn't percolating to the surface.

Mathiesen said the city will install equipment to monitor water levels in the future, which should help maintenance crews know when the field or areas of the field are being watered too much.

John McGee

From: Admin [admin@fallscity.org]
Sent: Thursday, September 20, 2012 2:39 PM
To: 'John McGee'
Subject: RE: follow up on repair projects

Let me share this information with James and see how much work we anticipate we can schedule. This should tell me if the plan for Fairoaks needs updating at this time. I know Carey Street was in his plans for this year, but I am not sure about Fairoaks. I am still trying to get up to speed on what we can accomplish and balancing time with budget limitations. I don't want you to spend time on a plan if we are not going to be able to put it to use.

Amber Mathiesen, CMC
City Administrator
Falls City, Oregon

☎: 503.787.3631 | ✉: 503.787.3023 | ✉: admin@fallscity.org

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From: John McGee [mailto:johnmcgee@jdmcgee.com]
Sent: Thursday, September 20, 2012 2:26 PM
To: 'Admin'
Subject: RE: follow up on repair projects

Hi Amber,

Dan let me know (a couple of weeks ago) that the dosing tank had been (mostly) cleaned and that the siphon to the "B-cells" appeared to work (at least once). I am under the impression that checking the siphons has now become part of the routine maintenance checks. There apparently was no observable cause for the malfunction. I got your email with the letter from DEQ and I read in the newspaper that the whole thing was caused by irrigation. I have been editing the 50% report to reflect this new information.

Fixing Carey Ct. PS must be done during high water table times. I think the procedure involves a polyurethane product that requires exposure to water in order to cure correctly. I would recommend calling Chris Rhodaback (Best Pots) 503 393-1311, or Mike Hamer (Mike Hamer Inc) 541-990-2179 for the repair work.

I designed a bypass for the Fairoaks (north side of town) PS about a decade ago when I worked for my last firm. I still have a copy of the plans, but they would need to be changed and updated. Is that something you want me to do?

Thanks,

John

John McGee, PE, PLS, CWRE
JD McGee, Inc.
PO Box 1472
Philomath, OR 97370
Phone: (541) 929-4226
Fax: (541) 929-4227

1

Email: johnmcgee@jdmcgee.com
Website: www.jdmcgee.com

From: Admin [mailto:admin@fallscity.org]
Sent: Thursday, September 20, 2012 12:56 PM
To: John McGee
Subject: follow up on repair projects

Hi John,

I wanted to quickly touch base with you. Has Dan kept you in the loop on the repairs we are planning for our dosing system? If not I will create some documentation to catch you up.

Also James mentioned you were going to be providing some information or contact info to some technical assistance for repair of the sewer line at the Carrie Court lift station. Forgive me for not having the history on this, but it seems there was a need to do some grout injection of some kind to reduce our I&I. There was also question about what work was needed to decommission another lift station on the north side of town. (sorry I don't know the name of that one).

Perhaps you can help me connect the dots?

Amber Mathiesen, CMC
City Administrator
Falls City, Oregon

☎ 503.787.3631 | 503.787.3023 | admin@fallscity.org

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2

John McGee

From: Daniel Bush [septech@mac.com]
Sent: Thursday, September 27, 2012 1:46 PM
To: John McGee
Subject: FC Siphons

John, so you know
Repaired B siphon on Tuesday this week
Was a break in the 1/2 inch snifter tube that facilitates air entrapment under a bell following a cycle.
The break was where threaded male and female fittings came together as the pipe dropped to 12 o'clock over the side of the bell. These fittings allow for adjustment of the length of the tube to correct recharge and to facilitate alternation between two (2) siphons
The break was right at the base of the threaded male adaptor suggesting it was over tightened at some time, but there were found to be abrasive marks on the top of the female elbow to suggest it had been struck by something, kids throwing rocks and metal inside the tank or from a pumper hose banging around inside or who knows?
Problem did not show its face until we restored the siphons to operation and B malfunctioned again. Staff were able to see intermittent air leakage in the area. Upon inspection the break was not obvious until I started to clean things and noted the pipe to wiggle some, different than the other. A tug and it came apart.
Was repaired using a special fast set, waterproof epoxy. This action was preceded by cleaning the area and fittings with a degreasing agent, followed by pvc pipe cleaner, followed by scraping off any residual foreign matter, followed by drying with a heat gun and an hours cure time.
Following repairs, the siphons were tested in real time mode successfully, B twice, per the data further down in the email. Nearly 48 hours later staff reports they are operating ok.
If we can get a siphon cycle counter installed, we will be able to get an idea of flows to compare to the influent meter, hopefully improving accuracy up to the point of the I & I overwhelming the system, as has been reported.
If we can get more monitoring stations in, then we can better evaluate the performance of the drainfield, make better decisions on management and hopefully, avoid another incident like that recently
Am not scheduled for any further field services with the City at this time.
Dan Bush

Begin forwarded message:

From: Daniel Bush <septech@mac.com>
Date: September 27, 2012 1:33:02 PM PDT
To: James Waters <codes@fallscity.org>
Subject: Re: Siphons

Thanks for the info. The news is encouraging. Would continue to make it a practice to check on these units. Hopefully, will be able to add the cycle counter device to facilitate monitoring.
The liquid level is odd the way it behaved to the valves
Your take is a reasonable explanation since B is not equal to A due to its history of flows received in a gravity mode and continuous fashion.
Also we know the construction is not necessarily according to the plans and DEQ criteria, so there could be areas of cross connection between cells, including A to B and vice versa
But, does not mean that B is poor, just different, which is reasonable to expect given the length and volume of flows it has received.
With the operations restored, the trench levels will change, typically improve, in that the dosing is to all the

1

cells and then only 2 or 3 times a day per half. Intermittent dosing allows the soil more time to process that which it has received. The alternating of flows between A & B also reduces the volume per cell and spreads an individual cell work load over more time.
With everything working to plan, the drainfield performance should improve. Thus, if we can get the additional monitoring wells, you will be able to monitor the performance and make informed judgements as to which what and when to make distribution adjustments (e.g. rest a cell).
Lets stay in touch on the siphons and drainfield
Dan Bush
On Sep 27, 2012, at 12:18 PM, James Walton wrote:

Dan, All looks good so far. The inspection pipe we installed for cell B2 had 2" of water in it ever since we turned the valves to the B cells off. After turning all the valves on, the water went away and hasn't returned. There must be some seepage from irrigation, but when the valve was opened it drained into the other cells????? Does this indicate that that cell is not draining?

Anyway, Thanks for the support and help with the siphons.

James Walton
Public Works Superintendant/Code Enforcement
City of Falls City
503-787-3631
codes@fallscity.org

----Original Message----
From: Daniel Bush [mailto:septech@mac.com]
Sent: Wednesday, September 26, 2012 5:00 PM
To: James Walton
Subject: Siphons

At 24 hours plus since our repair effort, how are the units performing?
One thing to watch is a drop in the operating level of either.
Yesterday, both units came on at 50" down from the steel frame of the access lid.

The following is data we gained from yesterday's testing.
Siphon A. Dose volume 32.75" = 4290 gallons in 6.25 min = 690 gpm (rounded for inflow during run).

Siphon B. Dose volume 33.00" = 1323 gallons in 6.56 min = 662 gpm (rounded for inflow during run).

Dan Bush.

3

August 2011 Water was discovered on the drainfield surface. The following correspondence was exchanged:

Oregon
John A. Kitzhaber, MD, Governor

Department of Environmental Quality
Western Region - Salem Office
750 Front St NE, Suite 120
Salem, OR 97301
(503) 378-8240
FAX (503) 373-7944
OTRS 1-800-735-2900

August 30, 2011

Mr. Don Poe
Wastewater Treatment Plant Supervisor
City of Falls City
Post Office 160
Falls City, OR 97344

RE: WQ-City of Falls City
NPDES Permit No. 101808
File No. 28830
EPA No. OR 003270-1
Polk County
Drainfield Bacteria

Dear Mr. Poe:

On Friday, August 26, 2011, you contacted our office stating the Falls City School District had irrigated the high school football field to the point of standing water on the playing surface. You asked about the potential health concerns of the football team playing on the field because the football field covers the city's wastewater treatment plant drainfield. Our Department asked you to take a water sample from a 12 inch deep soil test pit on the football field and have the sample analyzed for E. coli bacteria. On Monday, August 29, 2011, you reported that E. coli bacteria counts from the sample were approximately 600 colonies per 100 ml.

You also asked our Department if the City should allow the School District to conduct a high school football game on the field this coming Friday, September 2, 2011. You stated that the field was now dry and that the City had applied lime over the weekend and was intending to lime the playing field a second time.

The Department does not believe there would be a significant health risk in using the football field this Friday based on the information that the City has presented our Department to date - the current conditions of the playing field, the actions taken by the City and the dry weather predicted this week. However, the Department is not granting approval for use of play on the field as this decision should ultimately be made by the Falls City School District and the City of Falls City.

Finally, the Department requests the City of Falls City take the following actions:

- In conjunction with the Falls City School District, manage the amount of water irrigated per hour on the high school football field to eliminate future ponding water on the playing surface, and;
- Test the condition of the drainfield laterals under the football field and perform repairs/maintenance as necessary to ensure the drainfield is functioning as designed.

The Department appreciates the City's concerns regarding this matter. If you have any questions or additional concerns, please contact Robert Dicksa in our Salem office at 503-378-5039.

Sincerely,

Steve Schnurbusch
Western Region-Acting Water Quality Manager

RAD:

x:\shared\rdicksa\FallsCitydrainfield.doc

ecc:

Ms. Lynn Love
Business Manager
Falls City School District
Love_Lynn@FallsCity.K12.or.us

WATERLAB CORP.

2603 - 12th Street, SE
Salem, OR 97302
Voice: (503) 363-0473
FAX: (503) 363-6500

TEST REPORT

TO: City of Falls City Water Dept.
299 Mill St.
Falls City, OR 97344

08/26/2011

CITFAL

PO#:

Collection Information

Date: 08/25/2011
Time: NA
By: Don
Lab #: 20110825-016
Location: FC football fieldFC drain field

Lab Receipt Information

08/25/2011
1321
MH

Case Narrative

The analyses were performed according to the guidelines in the WATERLAB Corp Quality Assurance Program. This report contains analytical results for the sample(s) as received by the laboratory

Analyte	Method	Acc Results	Qual	MRL	Units	Analysis Date	Tech
E. coli, MPN	SM9223B	866.7		1	MPN/100 ml's	08/26/2011 1400	BEM

ND- No Detection at @ MRL
SM-"Standard Methods for the Examination of Water & Wastewater",19th ed
EPA- "Methods for Chemical Analyses for Water and Wastes",USEPA
MRL-"Method Reporting Limit"
A- Waterlab Corporation, ORELAP 100039

The results relate only to the parameters tested or to the sample as received by the laboratory.
This report shall not be reproduced except in full, without the written approval of Waterlab Corporation

Approved by: _____

Customer

Page 1 of 1

Appendix G: Water Use Analysis of Non-Residential Users

Water use during the winter months (January to March) was used in predicting sewer flow rates. It is believed that little or no outdoor water use occurs during those months. Some users have unexplained high usage for a few months. Those high usages may have been due to a plumbing leak, but they were included because it is presumed that the water leaked into the sewer system.

As an example, the elementary school had a flow of 105,000 gallons during the month of January, 2008. This seems like an unusually high use compared with other months, however a single toilet running at one gallon per minute can account for 43,200 gallons in one month.

Elementary School:

JAN - FEB - MAR ONLY

Transaction Date	Water Usage Month	Number of Days per Month	Water Usage (Gallons)	Gallons Used per Day
2/1/2005	January	31	21000	677
2/28/2005	February	29	56000	1931
4/1/2005	March	31	52000	1677
1/31/2006	January	31	62000	2000
2/27/2006	February	29	23000	793
3/28/2006	March	31	10000	323
1/25/2007	January	31	31000	1000
2/28/2007	February	29	60000	2069
3/31/2007	March	31	16000	516
1/21/2008	January	31	105000	3387
2/21/2008	February	29	15000	517
3/31/2008	March	31	21000	677
1/28/2009	January	31	21000	677
2/26/2009	February	29	21000	724
3/26/2009	March	31	23000	742
1/27/2010	January	31	9000	290
2/26/2010	February	29	41000	1414
3/26/2010	March	31	24000	774
1/27/2011	January	31	25000	806
2/28/2011	February	29	9000	310
3/30/2011	March	31	7000	226
1/27/2012	January	31	9000	290
2/27/2012	February	29	11000	379
3/27/2012	March	31	7000	226

575

Summary of JAN - MAR Water Usage		
Total Gallons Used on Record:	679,000	gallons
Total Monthly Average:	28,292	gallons/month
Maximum Monthly Usage:	105,000	gallons/month
Minimum Monthly Usage:	7,000	gallons/month
Average Water Usage per day:	935	gallons/day

Analysis of Septic Tank

Septic Tank Size (Shared by Tavern and Fire Station)	3000	gallons	*Tank size from 1986 As-Built Drawing
Typical Required Detention Time:	2	days	
Total Average Water Usage per day (Jan-Mar):	935	gallons/day	
Water that becomes sewage:	794	gallons/day	*Assumed 85% of water becomes sewage
Calculated Average Detention Time (Jan-Mar):	3.78	days	> 2 days required (OI

*Septic Tank currently gets pumped twice a year

High School:

JAN - FEB - MAR ONLY

Transaction Date	Water Usage Month	Number of Days per Month	Water Usage (Gallons)	Gallons Used per Day
2/1/2005	January	31	19000	613
2/28/2005	February	29	2000	69
4/1/2005	March	31	1000	32
1/31/2006	January	31	7000	226
2/27/2006	February	29	4000	138
3/28/2006	March	31	1000	32
1/25/2007	January	31	3000	97
2/28/2007	February	29	3000	103
3/31/2007	March	31	3000	97
1/21/2008	January	31	1000	32
2/21/2008	February	29	13000	448
3/31/2008	March	31	5000	161
1/28/2009	January	31	1000	32
2/26/2009	February	29	1000	34
3/26/2009	March	31	1000	32
1/27/2010	January	31	58000	1871
2/26/2010	February	29	17000	586
3/26/2010	March	31	11000	355
1/27/2011	January	31	4000	129
2/28/2011	February	29	1000	34
3/30/2011	March	31	2000	65
1/27/2012	January	31	2000	65
2/27/2012	February	29	6000	207
3/27/2012	March	31	1000	32

Summary of JAN - MAR Water Usage		
Total Gallons Used on Record:	167,000	gallons
Total Monthly Average:	6,958	gallons/month
Maximum Monthly Usage:	58,000	gallons/month
Minimum Monthly Usage:	1,000	gallons/month
Average Water Usage per day:	229	gallons/day

Analysis of Septic Tank

Septic Tank Size (Shared by Tavern and Fire Station)	3000	gallons	*Tank size from 1986 As-Built Drawing
Typical Required Detention Time:	2	days	
Total Average Water Usage per day (Jan-Mar):	229	gallons/day	
Water that becomes sewage:	194	gallons/day	*Assumed 85% of water becomes sewage
Calculated Average Detention Time (Jan-Mar):	15.42	days	> 2 days required (OK)

*Septic Tank currently gets pumped twice a year

Mitchell Street Apartments:

JAN - FEB - MAR ONLY

Transaction Date	Water Usage Month	Number of Days per Month	Water Usage (Gallons)	Gallons Used per Day
2/1/2005	January	31	10000	323
2/28/2005	February	29	11000	379
4/1/2005	March	31	13000	419
1/31/2006	January	31	39000	1258
2/27/2006	February	29	37000	1276
3/28/2006	March	31	9000	290
1/25/2007	January	31	42000	1355
2/28/2007	February	29	32000	1103
3/31/2007	March	31	47000	1516
1/21/2008	January	31	23000	742
2/21/2008	February	29	16000	552
3/31/2008	March	31	14000	452
1/28/2009	January	31	20000	645
2/26/2009	February	29	23000	793
3/26/2009	March	31	20000	645
1/27/2010	January	31	10000	323
2/26/2010	February	29	9000	310
3/26/2010	March	31	10000	323
1/27/2011	January	31	9000	290
2/28/2011	February	29	9000	310
3/30/2011	March	31	10000	323
1/27/2012	January	31	19000	613
2/27/2012	February	29	13000	448
3/27/2012	March	31	16000	516

Summary of JAN - MAR Water Usage

Total Gallons Used on Record:	461,000	gallons
Total Monthly Average:	19,208	gallons/month
Maximum Monthly Usage:	47,000	gallons/month
Minimum Monthly Usage:	9,000	gallons/month
Average Water Usage per day:	634	gallons/day

Analysis of Septic Tank

Septic Tank Size (Shared by Tavern and Fire Station)	3000	gallons	*Tank size from 1986 As-Built Drawing
Typical Required Detention Time:	2	days	
Total Average Water Usage per day (Jan-Mar):	634	gallons/day	
Water that becomes sewage:	538	gallons/day	*Assumed 85% of water becomes sewage
Calculated Average Detention Time (Jan-Mar):	5.57	days	> 2 days required (O

*Septic Tank currently gets pumped twice a year

Fire Station/Community Center:

JAN - FEB - MAR ONLY

Transaction Date	Water Usage Month	Number of Days per Month	Water Usage (Gallons)	Gallons Used per Day
2/1/2005	January	31	2000	65
2/28/2005	February	29	8000	276
4/1/2005	March	31	3000	97
1/31/2006	January	31	0	0
2/27/2006	February	29	0	0
3/28/2006	March	31	0	0
1/25/2007	January	31	0	0
2/28/2007	February	29		0
3/31/2007	March	31	0	0
1/21/2008	January	31	2000	65
2/21/2008	February	29	1000	34
3/31/2008	March	31	5000	161
1/28/2009	January	31	1000	32
2/26/2009	February	29	3000	103
3/26/2009	March	31	0	0
1/27/2010	January	31	1000	32
2/26/2010	February	29	1000	34
3/26/2010	March	31	1000	32
1/27/2011	January	31	0	0
2/28/2011	February	29	2000	69
3/30/2011	March	31	0	0
1/27/2012	January	31	2000	65
2/27/2012	February	29	1000	34
3/27/2012	March	31	1000	32

Summary of JAN - MAR Water Usage

Total Gallons Used on Record:	34,000	gallons
Total Monthly Average:	1,478	gallons/month
Maximum Monthly Usage:	8,000	gallons/month
Minimum Monthly Usage:	0	gallons/month
Average Water Usage per day:	47	gallons/day

Analysis of Septic Tank

Septic Tank Size (Shared by Tavern and Fire Station)	1250	gallons	*Tank size from 1986 As-Built Drawing
Typical Required Detention Time:	2	days	
Total Average Water Usage per day (Jan-Mar):	47	gallons/day	
Water that becomes sewage:	40	gallons/day	*Assumed 85% of water becomes sewage
Calculated Average Detention Time (Jan-Mar):	31.17	days	> 2 days required (O

*Septic Tank currently gets pumped twice a year

Boondocks Tavern:

JAN - FEB - MAR ONLY

Transaction Date	Water Usage Month	Number of Days per Month	Water Usage (Gallons)	Gallons Used per Day
2/1/2005	January	31	5000	161
2/28/2005	February	29	8000	276
4/1/2005	March	31	9000	290
1/31/2006	January	31	6000	194
2/27/2006	February	29	8000	276
3/28/2006	March	31	7000	226
1/25/2007	January	31	8000	258
2/28/2007	February	29	9000	310
3/31/2007	March	31	8000	258
1/21/2008	January	31	22000	710
2/21/2008	February	29	15000	517
3/31/2008	March	31	7000	226
1/28/2009	January	31	8000	258
2/26/2009	February	29	7000	241
3/26/2009	March	31	7000	226
112712010	January	31	7000	226
2/26/2020	February	29	10000	345
3/26/2010	March	31	7000	226
1/27/2011	January	31	8000	258
2/28/2011	February	29	6000	207
3/30/2011	March	31	6000	194
1/27/2012	January	31	10000	323
2/27/2012	February	29	8000	276
3/27/2012	March	31	12000	387

Boondocks - Summary of JAN - MAR Water Usage		
Total Gallons Used on Record:	208,000	gallons
Total Monthly Average:	8,667	gallons/month
Maximum Monthly Usage:	22,000	gallons/month
Minimum Monthly Usage:	5,000	gallons/month
Average Water Usage per day:	286	gallons/day

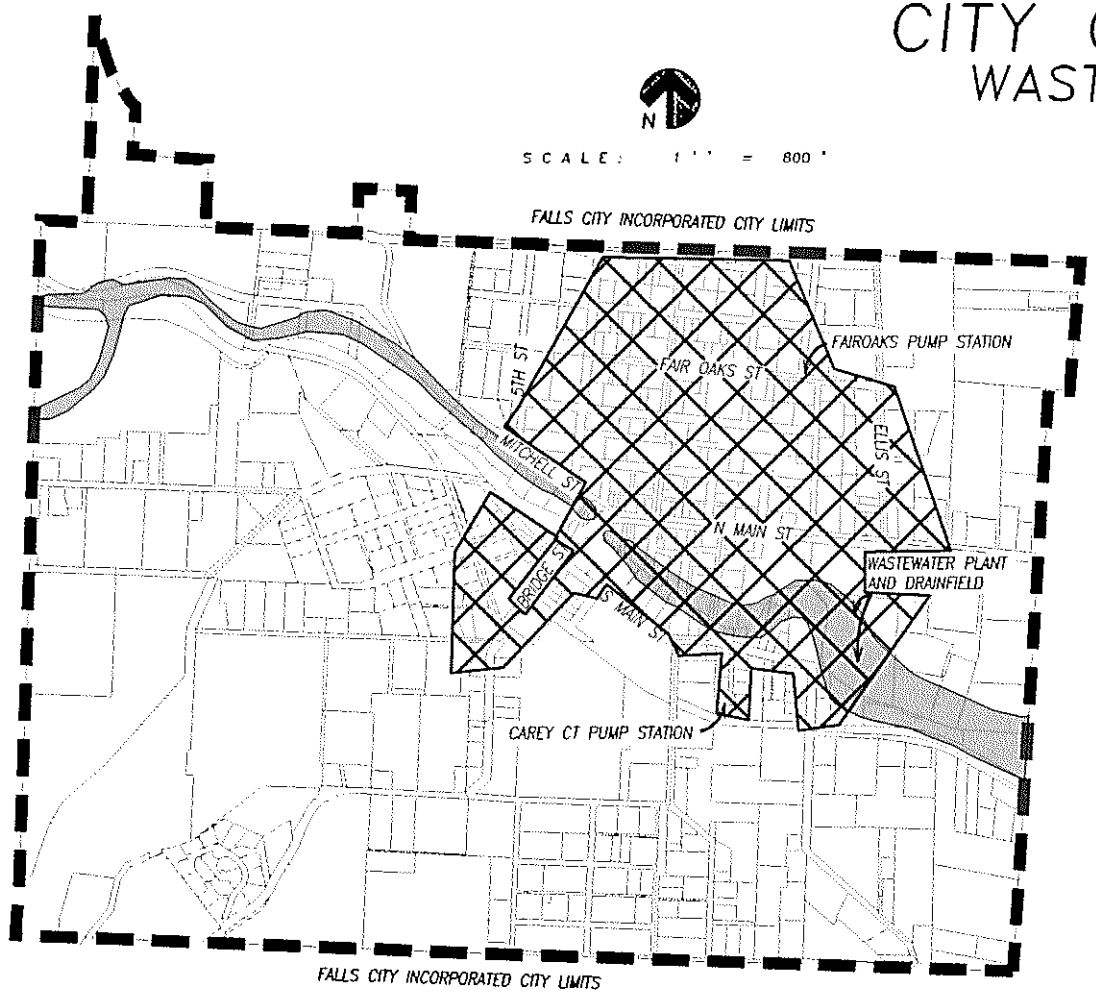
Fire Station - Summary of JAN - MAR Water Usage		
Total Gallons Used on Record:	34000	gallons
Total Monthly Average:	1478	gallons/month
Maximum Monthly Usage:	8000	gallons/month
Minimum Monthly Usage:	0	gallons/month
Average Water Usage per day:	47	gallons/day

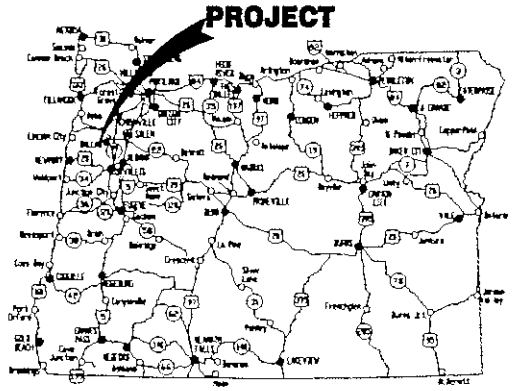
Analysis of Septic Tank			
Septic Tank Size (Shared by Tavern and Fire Station)	1250	gallons	*Tank size from 1986 As-Built Drawing
Typical Required Detention Time:	2	days	
Total Average Water Usage per day (Jan-Mar):	333	gallons/day	
Water that becomes sewage:	283	gallons/day	*Assumed 85% of water becomes sewage
Calculated Average Detention Time (Jan-Mar):	4.41	days	> 2 days required (OK)

*Septic Tank currently gets pumped twice a year

Appendix H: Falls City Sewer Collection System Maps

CITY OF FALLS CITY
WASTEWATER SYSTEM





LEGEND

- INCORPORATED CITY LIMITS
- FEMA FLOOD ZONE PER FIRM MAP NUMBER 41053C0355F PANELS 355 AND 360
- STEP/STEG SEWERED AREA

Falls City Wastewater System Map
Sec 16 & 17 & 20 & 21, Township 8S, Range 6W, W.M.
Falls City, Polk County, Oregon

Date	By	Revisions

JDMcGee, Inc.
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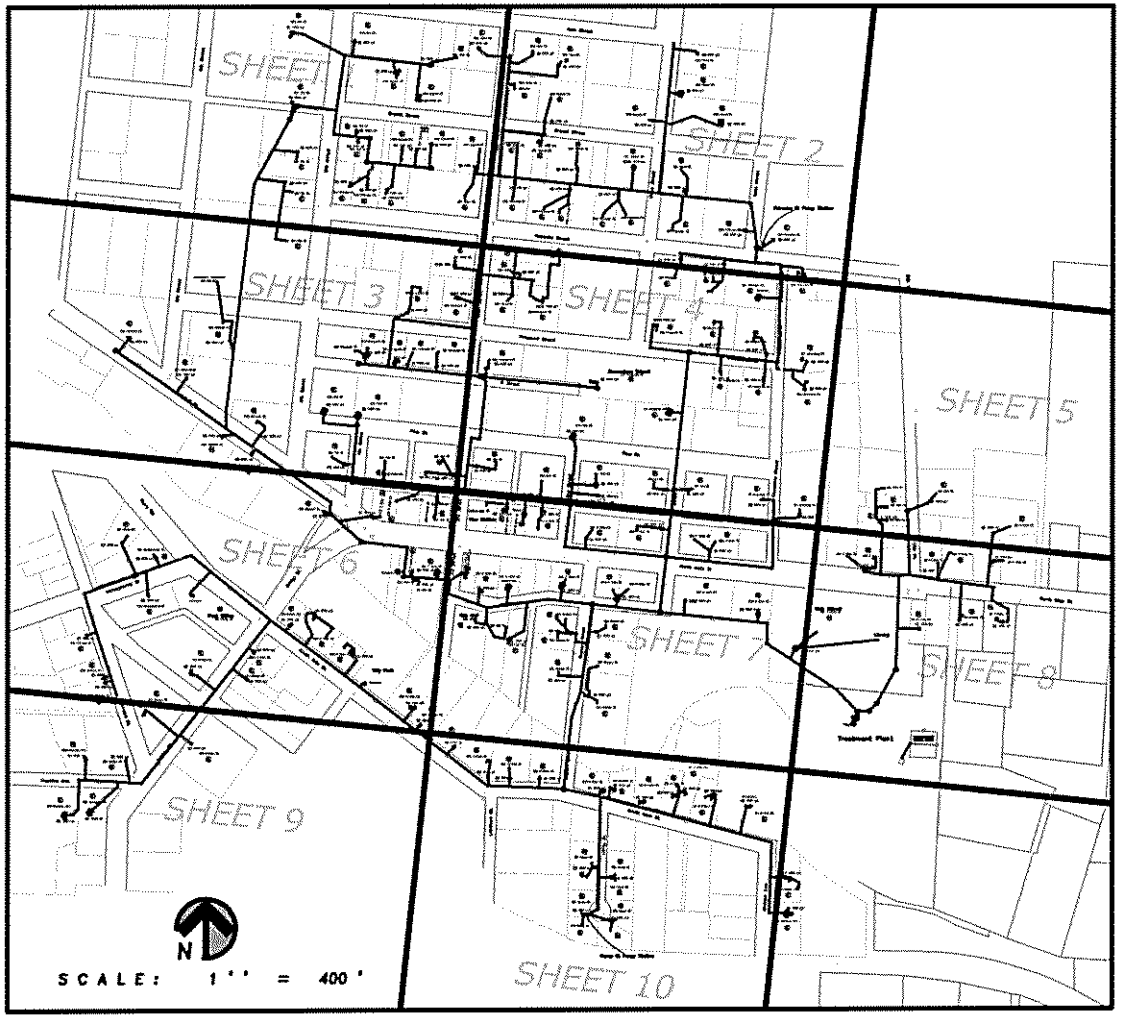
www.jdmcgee.com

Job #:	12-17C
Date:	12/5/13
Drawn:	SDO
Checked:	JDM
Filed:	

VICINITY MAP

Sheet C0

821



CITY OF FALLS CITY
WASTEWATER SYSTEM

LEGEND

- SEPTIC TANK RISER
- EFFLUENT SEWER CLEANOUT
- SANITARY SEWER CLEANOUT
- MANHOLE
- FIRE HYDRANT
- WATER VALVE
- P PUMPED SEPTIC TANK
- SEPTIC TANK RISER – NOT LOCATED
- EFFLUENT SEWER CLEANOUT – NOT LOCATED
- (E) EASEMENT EXIST IN FAVOR OF CITY
- (N) NO EASEMENT EXIST IN FAVOR OF CITY

SEWER LINE LENGTHS*

2" PRESSURE MAIN – 1382'
2" PRESSURE SERVICE LATERAL – 1722'
3" PRESSURE MAIN – 776'

4" MAIN – 17,225'
4" SERVICE LATERAL – 7,113'
6" MAIN – 625'

TOTAL MAIN LENGTH = 20,018'
TOTAL SERVICE LATERAL LENGTH = 8,835'
TOTAL SEWER LENGTH = 28,853' = 5.46 MILES

* SEWER LENGTHS ARE APPROXIMATED USING BEST AVAILABLE INFORMATION

SEPTIC TANK COUNT

1000 GALLON – 106
1250 GALLON – 18
1500 GALLON – 9
3000 GALLON – 3
EXISTING TANKS – 10
UNKNOWN SIZE – 5

DISCLAIMERS

- THIS IS NOT A BOUNDARY SURVEY.
- TAXLINES ARE APPROXIMATED.
- SUBSURFACE CONNECTIONS/LINES ARE APPROXIMATED.
- ROAD RIGHT-OF-WAYS ARE APPROXIMATED.
- DASHED LINES/SYMBOLS INDICATE ITEM NOT LOCATED

Falls City Wastewater System Map
Sec 16 & 17 & 20 & 21, Township 8S, Range 6W, W.M.
Falls City, Polk County, Oregon

Date	By	Revisions

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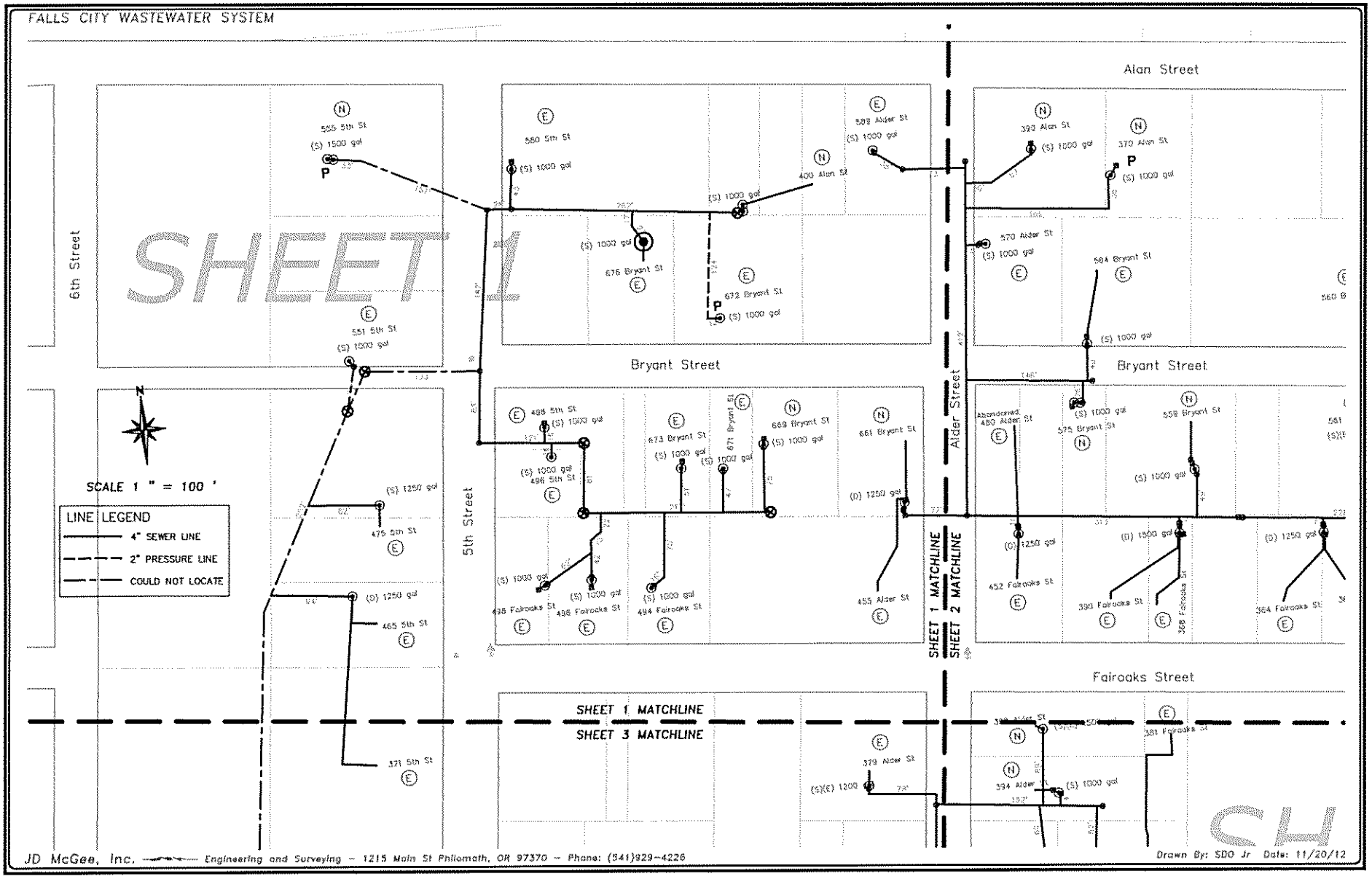
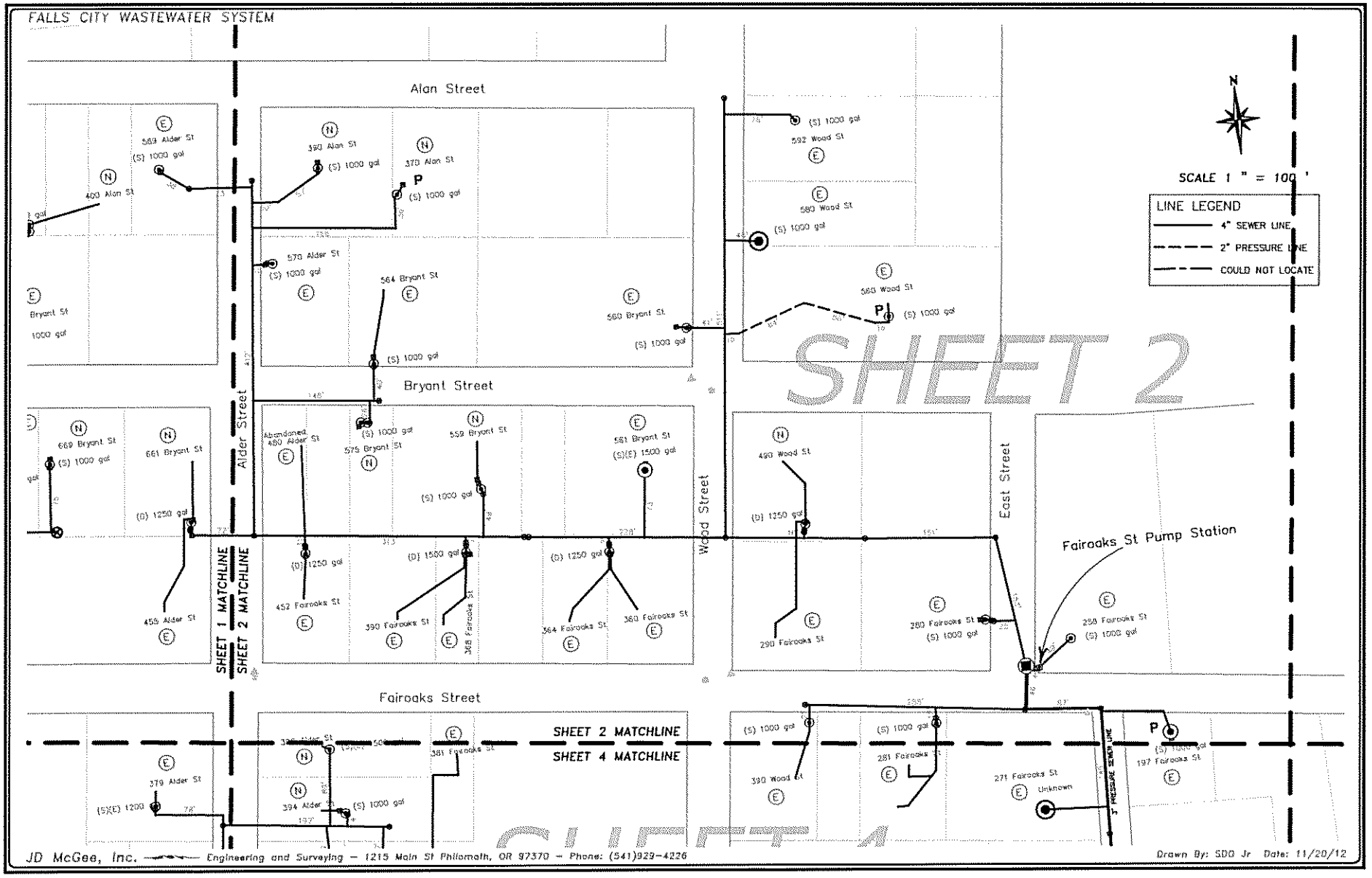
www.jdmcgee.com

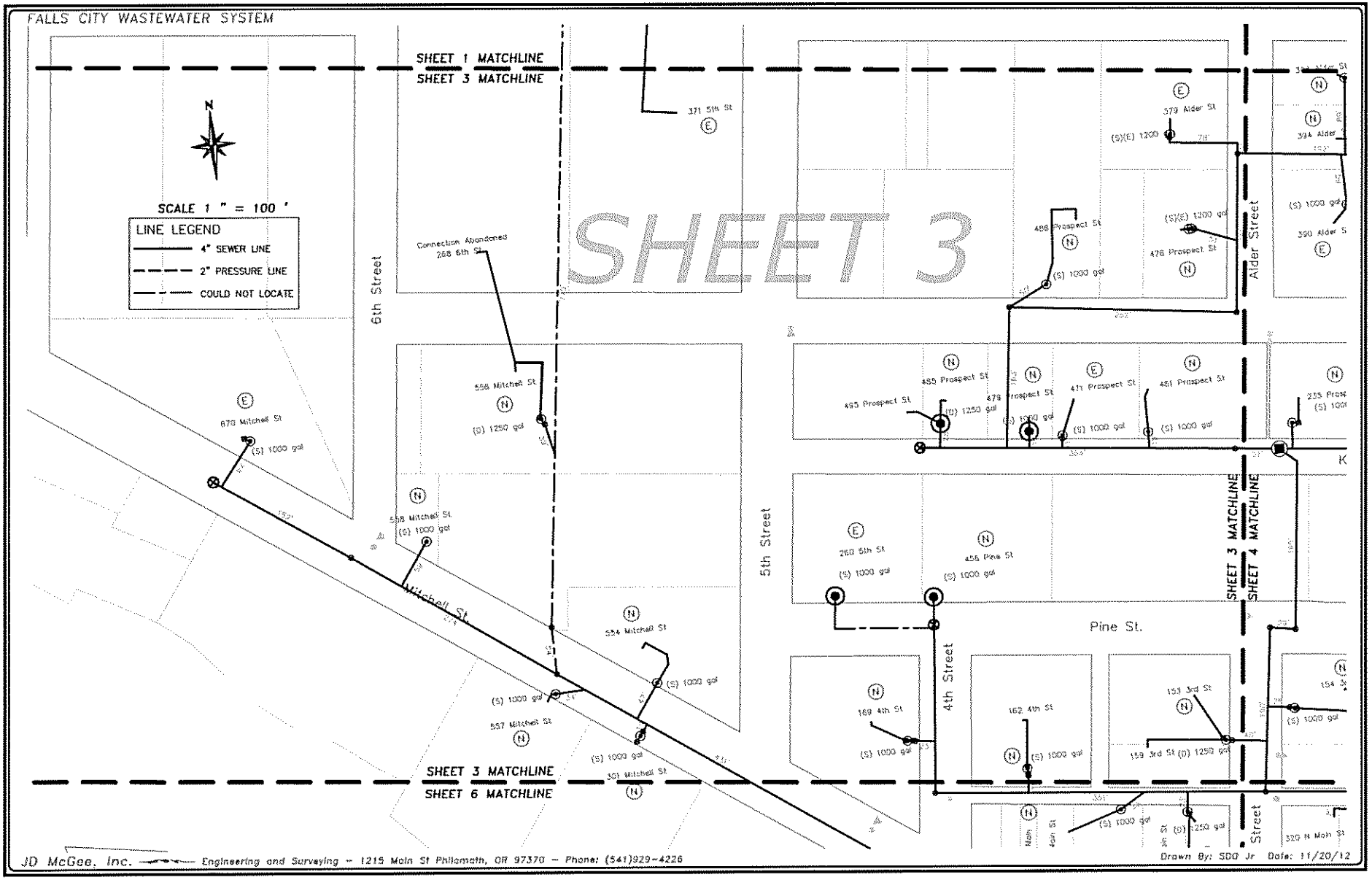
Job #:	12-17C
Date:	11/20/12
Drawn:	SDO
Checked:	JDM
Filed:	

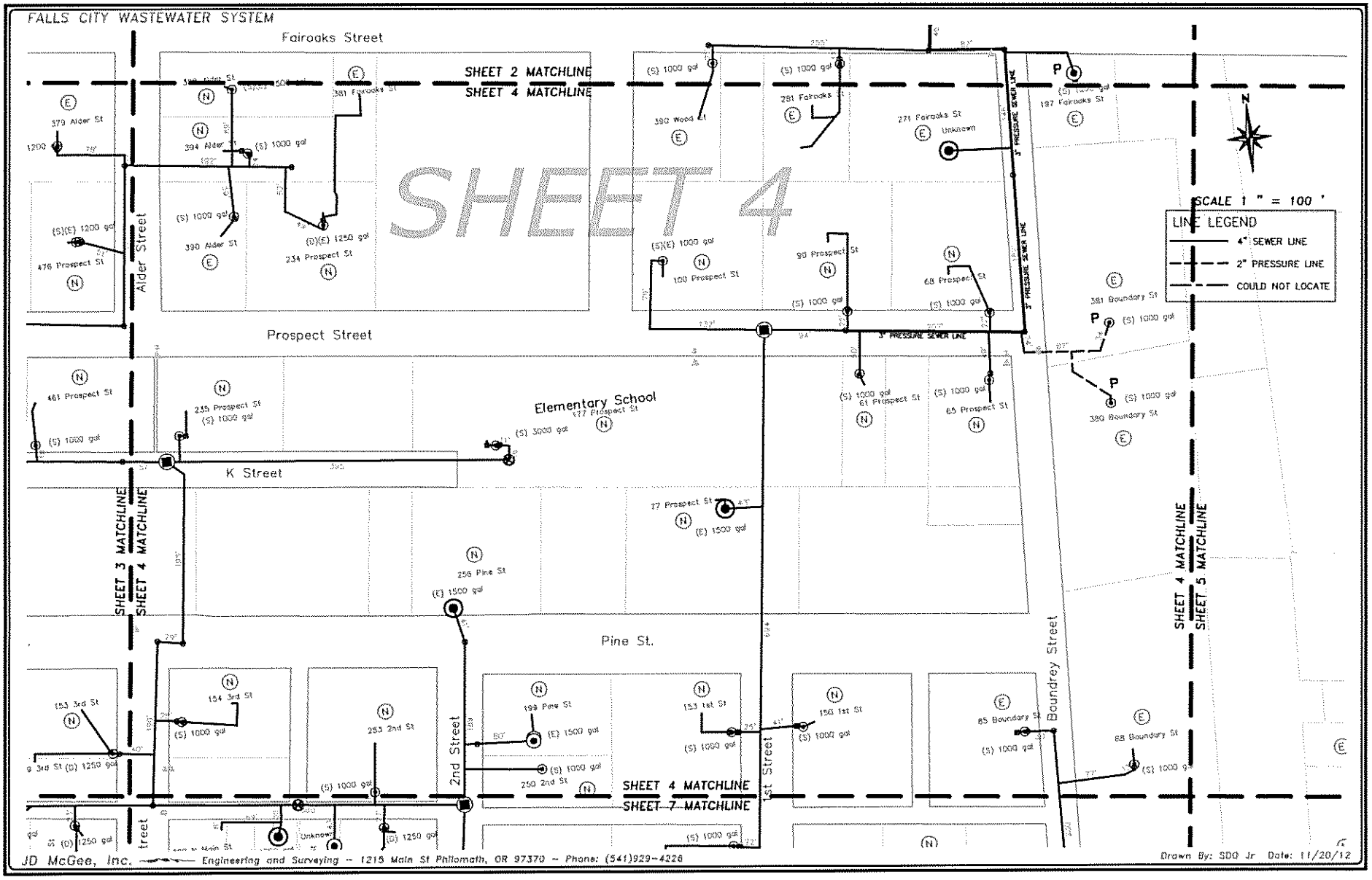
VICINITY MAP

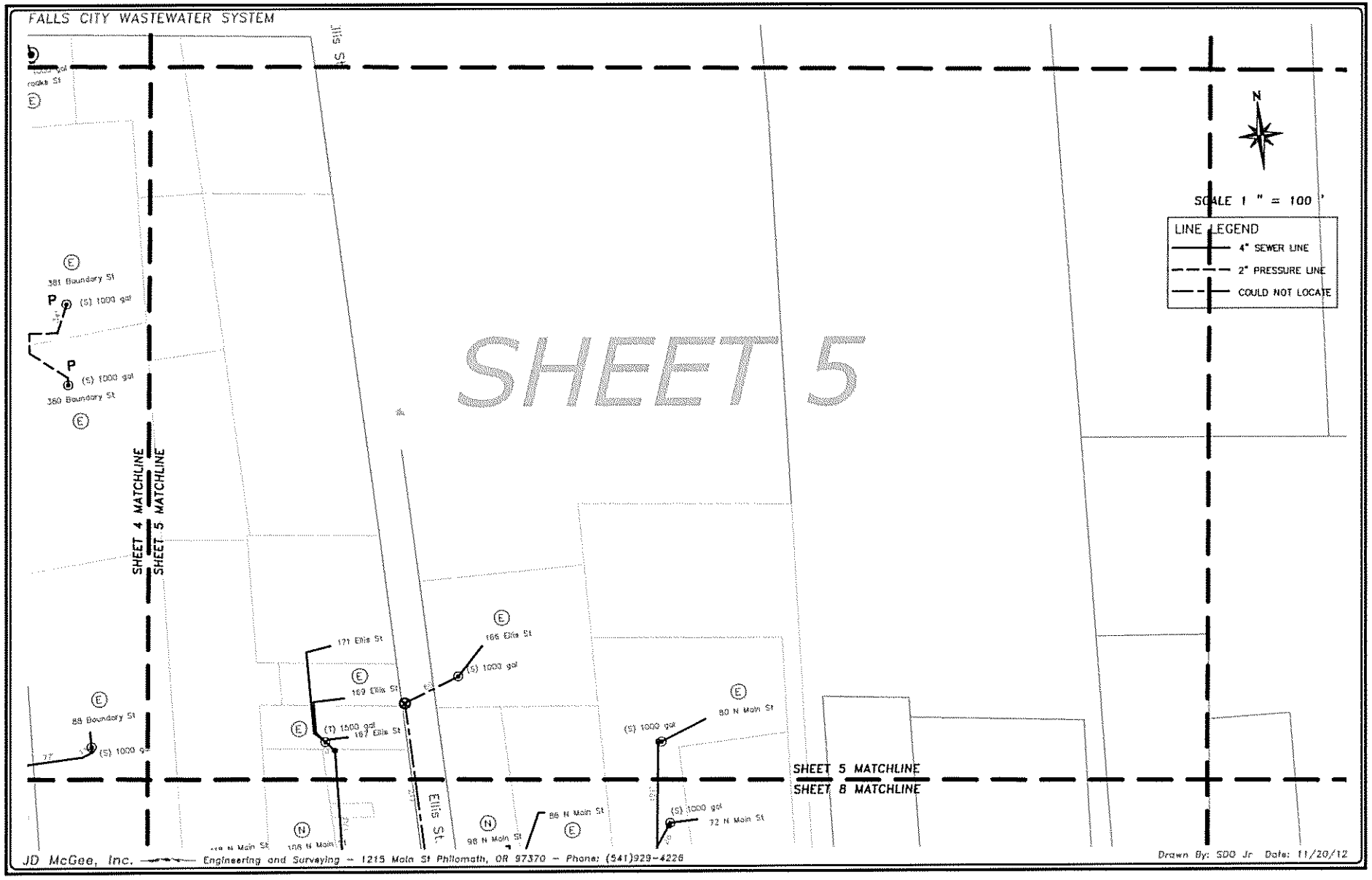
Sheet C1

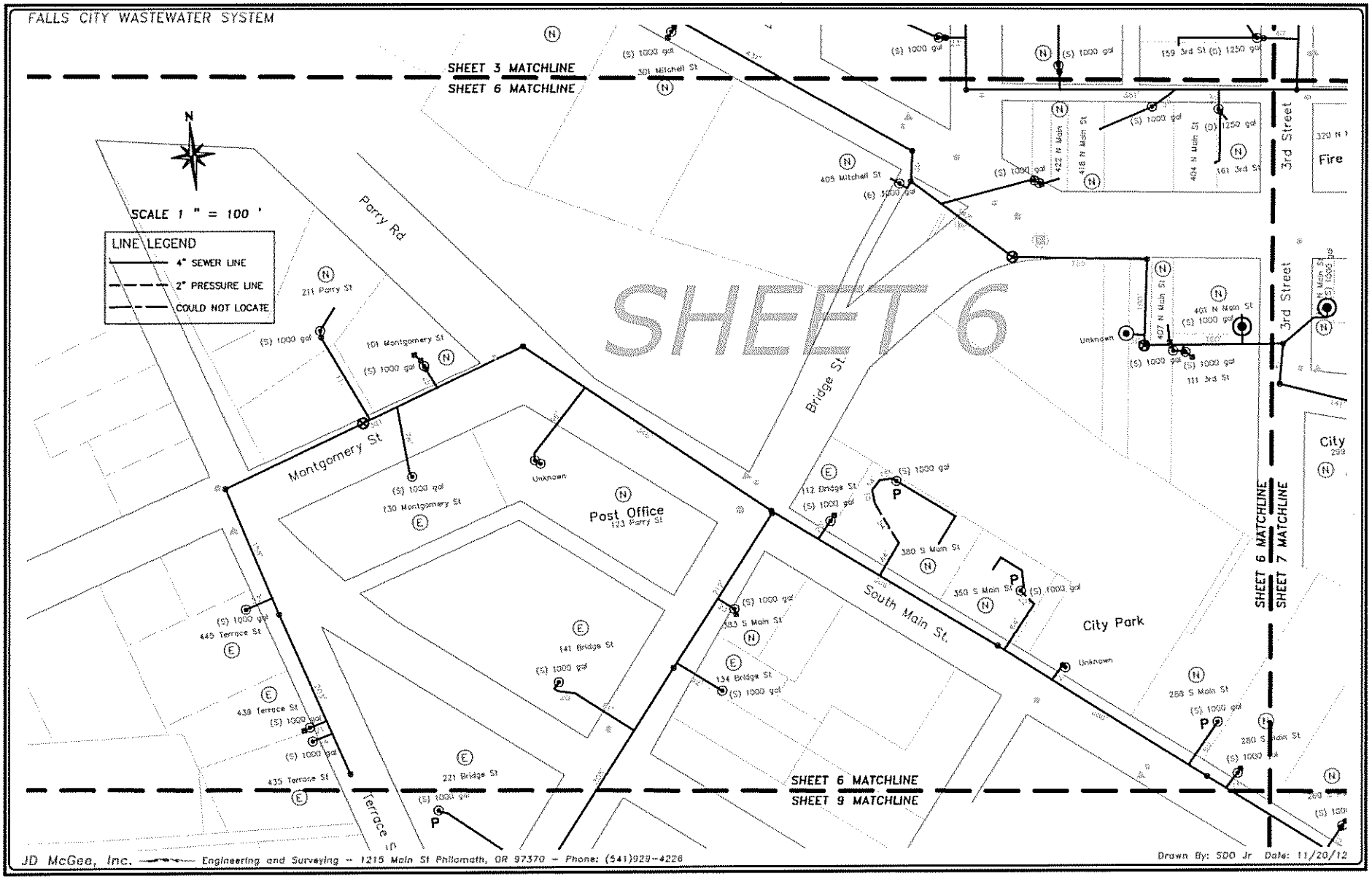

FALLS CITY WASTEWATER SYSTEM
SHEET 1
6th Street
5th Street
Alder Street
Alan Street
Bryant Street
Fairoaks Street
SCALE 1 " = 100 '
LINE LEGEND
4" SEWER LINE
2" PRESSURE LINE
COULD NOT LOCATE
SHEET 1 MATCHLINE
SHEET 2 MATCHLINE
SHEET 1 MATCHLINE
SHEET 3 MATCHLINE
555 5th St (S) 1500 gal
580 5th St (S) 1000 gal
551 5th St (S) 1500 gal
676 Bryant St (S) 1000 gal
672 Bryant St (S) 1000 gal
400 Alan St
509 Alder St (S) 1000 gal
390 Alan St (S) 1000 gal
370 Alan St (S) 1000 gal
570 Alder St (S) 1000 gal
564 Bryant St (S) 1000 gal
575 Bryant St
559 Bryant St (S) 1000 gal
Abandoned 480 Alder St
452 Fairoaks St
390 Fairoaks St
364 Fairoaks St
498 5th St (S) 1000 gal
496 5th St (S) 1000 gal
673 Bryant St (S) 1000 gal
671 Bryant St (S) 1000 gal
669 Bryant St (S) 1000 gal
661 Bryant St (D) 1250 gal
455 Alder St
438 Fairoaks St (S) 1000 gal
436 Fairoaks St (S) 1000 gal
434 Fairoaks St (S) 1000 gal
475 5th St (S) 1250 gal
465 5th St (D) 1250 gal
371 5th St
379 Alder St (S)(E) 1200
394 Alder St (S) 1000 gal
381 Fairoaks St
JD McGee, Inc. — Engineering and Surveying — 1215 Main St Philomath, OR 97370 — Phone: (541)929-4226
Drawn By: SDO Jr Date: 11/20/12
CH

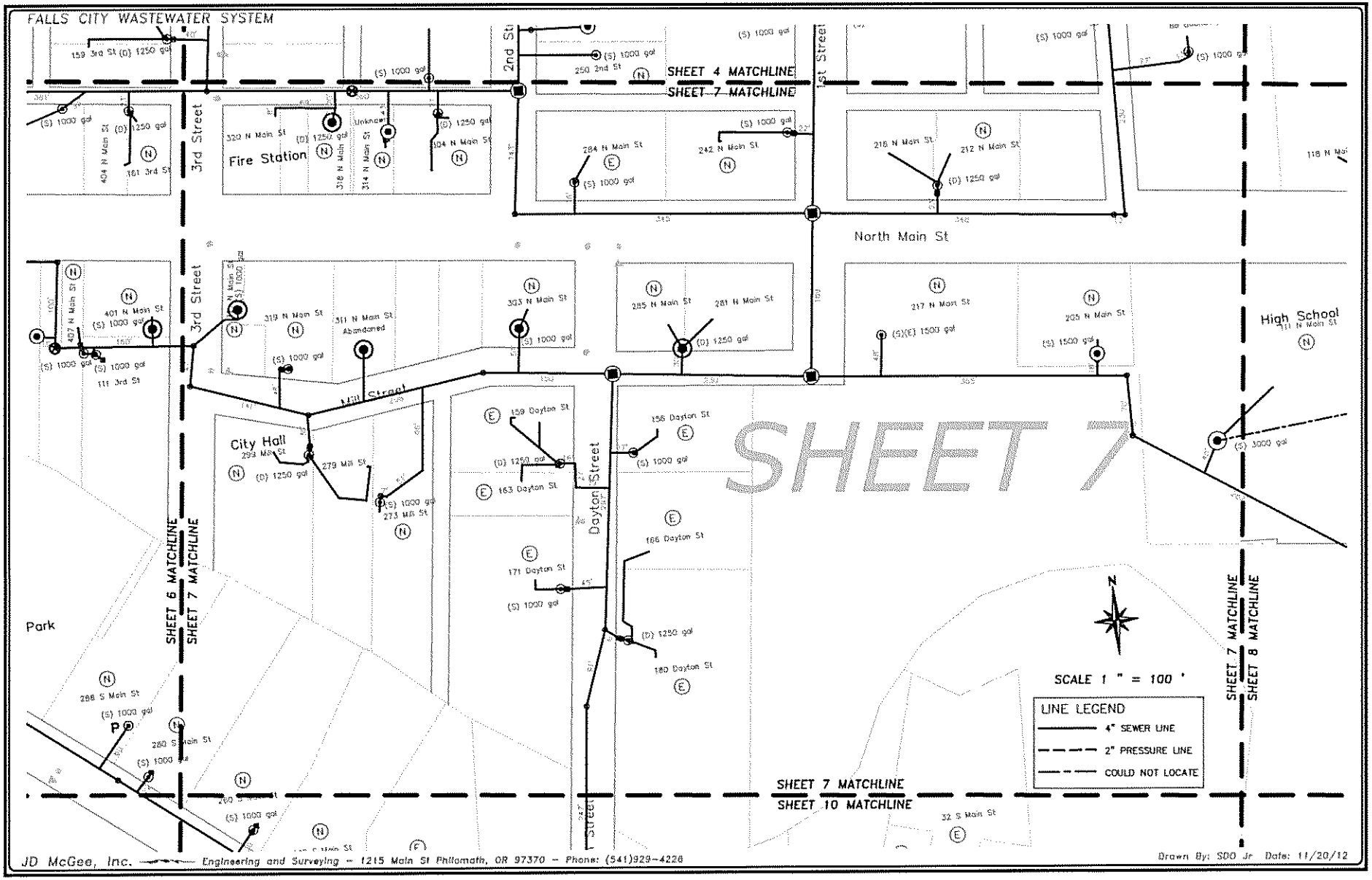

FALLS CITY WASTEWATER SYSTEM
Alan Street
Bryant Street
Fairoaks Street
Alder Street
Wood Street
East Street
SCALE 1 " = 100 '
LINE LEGEND
4" SEWER LINE
2" PRESSURE LINE
COULD NOT LOCATE
SHEET 1 MATCHLINE
SHEET 2 MATCHLINE
SHEET 2 MATCHLINE
SHEET 4 MATCHLINE
Fairoaks St Pump Station
SHEET 2
SHEET 4
JD McGee, Inc. — Engineering and Surveying — 1215 Main St Philomath, OR 97370 — Phone: (541)929-4226
Drawn By: SDO Jr Date: 11/20/12

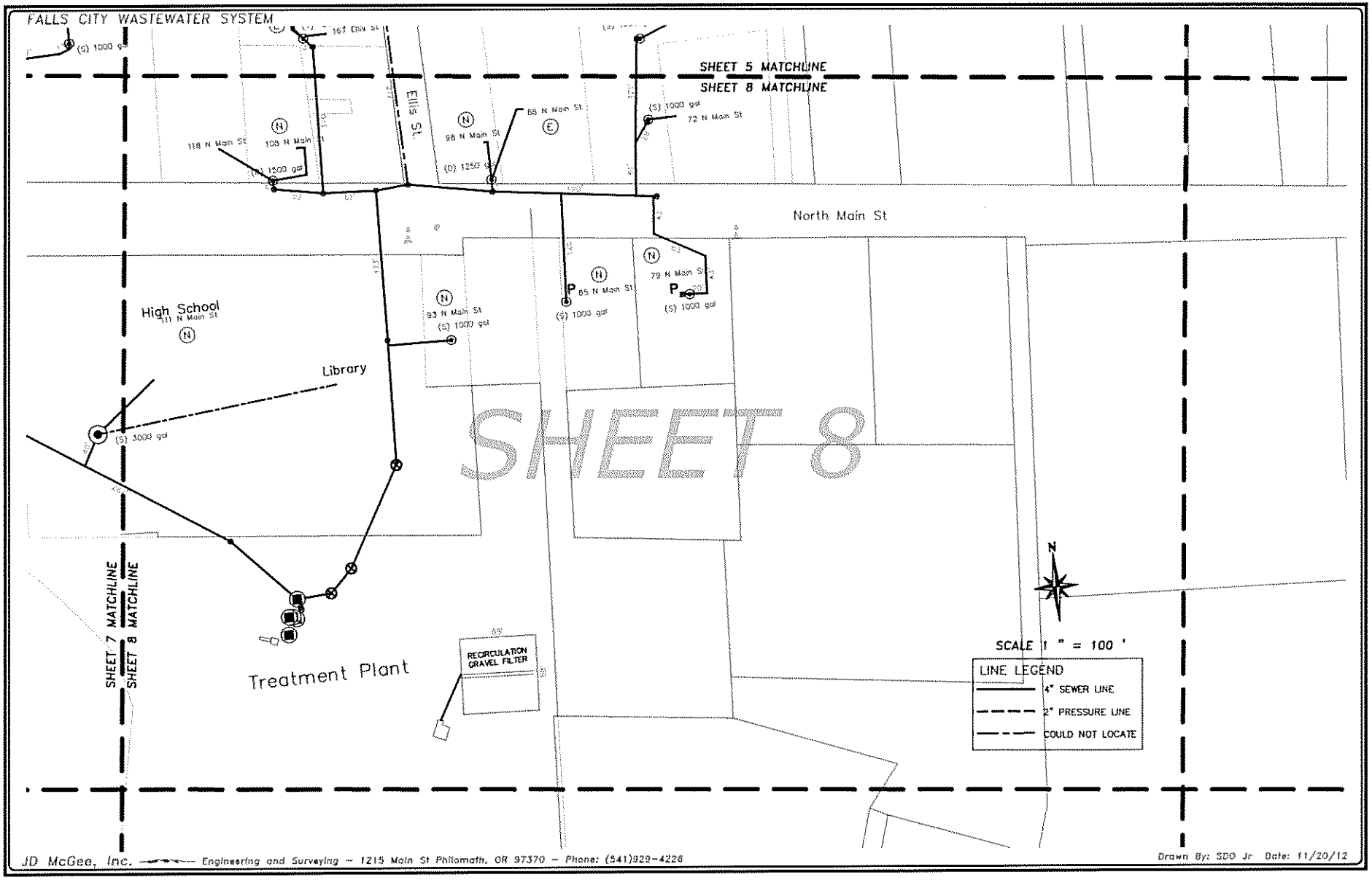

FALLS CITY WASTEWATER SYSTEM
SHEET 1 MATCHLINE
SHEET 3 MATCHLINE
SHEET 3
SCALE 1 " = 100 '
LINE LEGEND
4" SEWER LINE
2" PRESSURE LINE
COULD NOT LOCATE
6th Street
5th Street
4th Street
Alder Street
Mitchell St
Pine St.
Connection Abandoned 268 6th St
371 5th St
379 Alder St
324 Alder
390 Alder St
488 Prospect St
476 Prospect St
495 Prospect St
479 Prospect St
471 Prospect St
451 Prospect St
670 Mitchell St
556 Mitchell St
558 Mitchell St
554 Mitchell St
557 Mitchell St
551 Mitchell St
260 5th St
456 Pine St
169 4th St
162 4th St
153 3rd St
159 3rd St
320 N Main St
SHEET 3 MATCHLINE
SHEET 6 MATCHLINE
SHEET 4 MATCHLINE
JD McGee, Inc. — Engineering and Surveying — 1215 Main St Philomath, OR 97370 — Phone: (541)929-4226
Drawn By: SDO Jr Date: 11/20/12

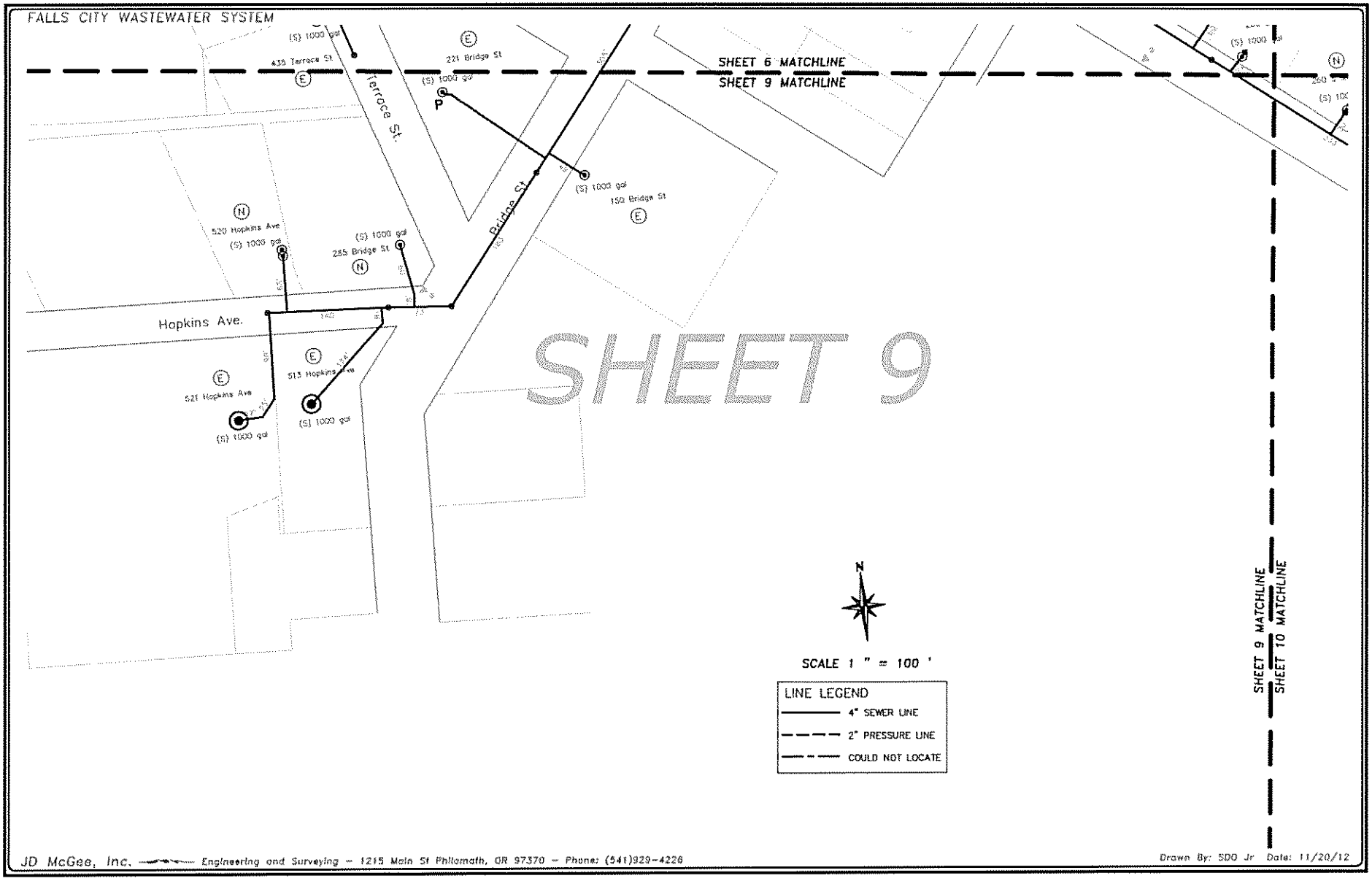

FALLS CITY WASTEWATER SYSTEM
SHEET 4
Fairoaks Street
SHEET 2 MATCHLINE
SHEET 4 MATCHLINE
Alder Street
Prospect Street
K Street
Pine St.
2nd Street
1st Street
Boundrey Street
Elementary School
SHEET 3 MATCHLINE
SHEET 4 MATCHLINE
SHEET 4 MATCHLINE
SHEET 5 MATCHLINE
SHEET 4 MATCHLINE
SHEET 7 MATCHLINE
3" PRESSURE SEWER LINE
SCALE 1 " = 100 '
LINE LEGEND
4" SEWER LINE
2" PRESSURE LINE
COULD NOT LOCATE
JD McGee, Inc. — Engineering and Surveying — 1215 Main St Philomath, OR 97370 — Phone: (541)929-4226
Drawn By: SDO Jr Date: 11/20/12


FALLS CITY WASTEWATER SYSTEM
SHEET 5
SCALE 1 " = 100 '
LINE LEGEND
4" SEWER LINE
2" PRESSURE LINE
COULD NOT LOCATE
SHEET 4 MATCHLINE
SHEET 5 MATCHLINE
SHEET 5 MATCHLINE
SHEET 8 MATCHLINE
381 Boundary St
(S) 1000 gal
380 Boundary St
(S) 1000 gal
89 Boundary St
(S) 1000 gal
171 Ellis St
169 Ellis St
167 Ellis St
(T) 1500 gal
166 Ellis St
(S) 1000 gal
Ellis St
80 N Main St
(S) 1000 gal
72 N Main St
(S) 1000 gal
98 N Main St
86 N Main St
JD McGee, Inc. — Engineering and Surveying — 1215 Main St Philomath, OR 97370 — Phone: (541)929-4226
Drawn By: SDO Jr Date: 11/20/12


FALLS CITY WASTEWATER SYSTEM
SHEET 3 MATCHLINE
SHEET 6 MATCHLINE
SCALE 1 " = 100 '
LINE LEGEND
4" SEWER LINE
2" PRESSURE LINE
COULD NOT LOCATE
SHEET 6
Parry Rd
Bridge St.
Montgomery St
South Main St.
3rd Street
Terrace St
211 Parry St
101 Montgomery St
130 Montgomery St
Post Office
123 Parry St
112 Bridge St
380 S Main St
350 S Main St
City Park
141 Bridge St
134 Bridge St
221 Bridge St
445 Terrace St
439 Terrace St
435 Terrace St
405 Mitchell St
301 Mitchell St
422 N Main St
416 N Main St
404 N Main St
161 3rd St
159 3rd St
407 N Main St
401 N Main St
111 3rd St
Unknown
Fire
City
SHEET 6 MATCHLINE
SHEET 7 MATCHLINE
SHEET 6 MATCHLINE
SHEET 9 MATCHLINE
JD McGee, Inc. — Engineering and Surveying — 1215 Main St Philomath, OR 97370 — Phone: (541)929-4226
Drawn By: SDO Jr Date: 11/20/12

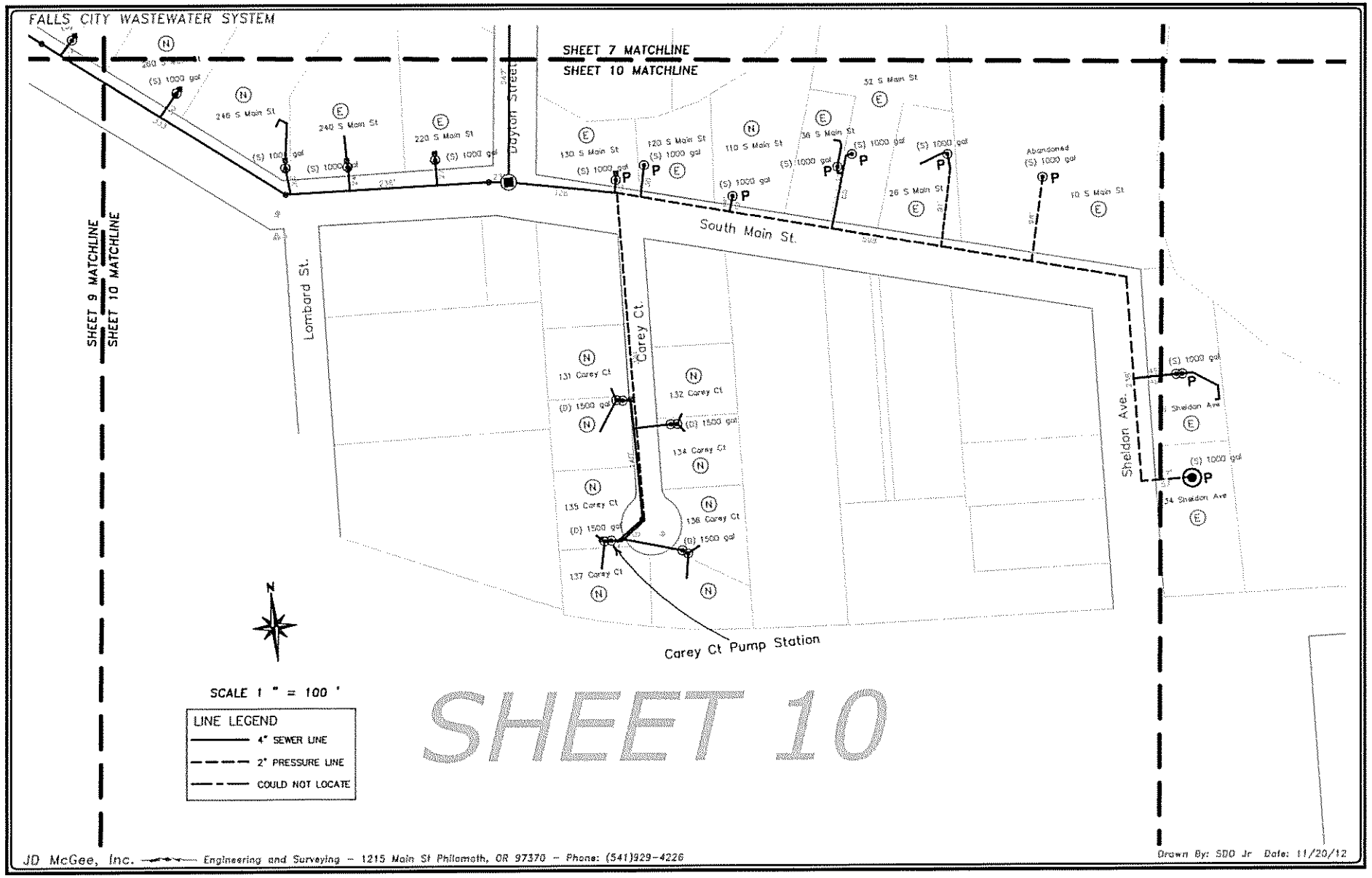

FALLS CITY WASTEWATER SYSTEM
SHEET 7
SHEET 4 MATCHLINE
SHEET 7 MATCHLINE
SHEET 6 MATCHLINE
SHEET 7 MATCHLINE
SHEET 7 MATCHLINE
SHEET 10 MATCHLINE
SHEET 7 MATCHLINE
SHEET 8 MATCHLINE
North Main St
3rd Street
2nd St
1st Street
Mill Street
Dayton Street
Fire Station
City Hall
High School
Park
SCALE 1 " = 100 '
LINE LEGEND
4" SEWER LINE
2" PRESSURE LINE
COULD NOT LOCATE
JD McGee, Inc. — Engineering and Surveying — 1215 Main St Philomath, OR 97370 — Phone: (541)929-4228
Drawn By: SDO Jr Date: 11/20/12


FALLS CITY WASTEWATER SYSTEM
SHEET 5 MATCHLINE
SHEET 8 MATCHLINE
Ellis St
North Main St
118 N Main St
105 N Main St
(D) 1500 gal
98 N Main St
(D) 1250 gal
86 N Main St
72 N Main St
(S) 1000 gal
93 N Main St
(S) 1000 gal
85 N Main St
(S) 1000 gal
79 N Main St
(S) 1000 gal
High School
111 N Main St
Library
(S) 3000 gal
SHEET 8
SHEET 7 MATCHLINE
SHEET 8 MATCHLINE
Treatment Plant
RECIRCULATION GRAVEL FILTER
N
SCALE 1 " = 100 '
LINE LEGEND
4" SEWER LINE
2" PRESSURE LINE
COULD NOT LOCATE
JD McGee, Inc. — Engineering and Surveying — 1215 Main St Philomath, OR 97370 — Phone: (541)929-4226
Drawn By: SDO Jr Date: 11/20/12

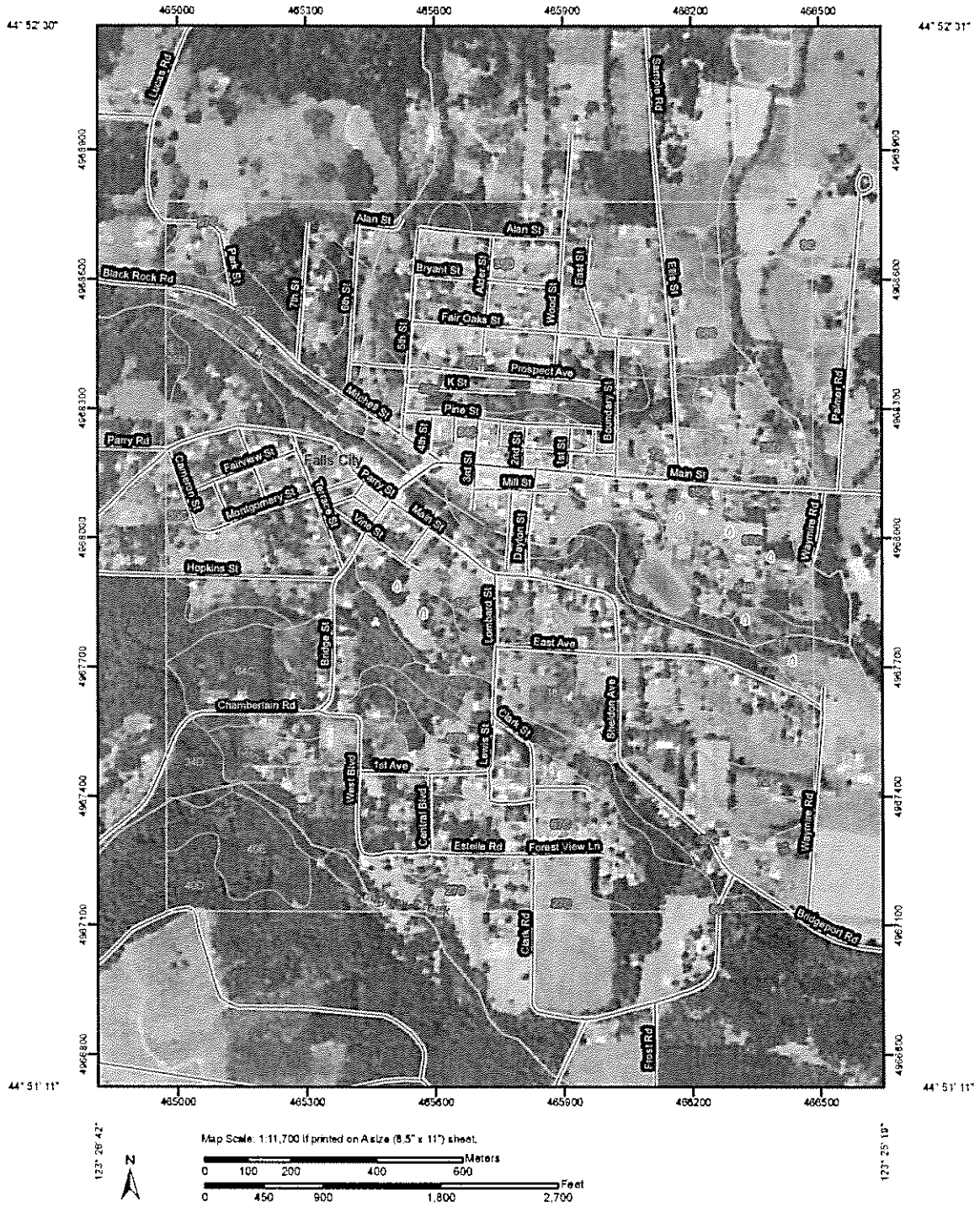


JD McGee, Inc. — Engineering and Surveying — 1215 Main St Philomath, OR 97370 — Phone: (541)929-4226

Drawn By: SDO Jr Date: 11/20/12


FALLS CITY WASTEWATER SYSTEM
SHEET 7 MATCHLINE
SHEET 10 MATCHLINE
SHEET 9 MATCHLINE
SHEET 10 MATCHLINE
Dayton Street
South Main St.
Lombard St.
Carey Ct.
Sheldon Ave.
246 S Main St
240 S Main St
220 S Main St
130 S Main St
120 S Main St
110 S Main St
36 S Main St
32 S Main St
26 S Main St
10 S Main St
Abandoned
(S) 1000 gal
131 Carey Ct
132 Carey Ct
134 Carey Ct
135 Carey Ct
136 Carey Ct
137 Carey Ct
(D) 1500 gal
34 Sheldon Ave
Carey Ct Pump Station
N
SCALE 1 " = 100 '
LINE LEGEND
4" SEWER LINE
2" PRESSURE LINE
COULD NOT LOCATE
SHEET 10
JD McGee, Inc. — Engineering and Surveying — 1215 Main St Philomath, OR 97370 — Phone: (541)929-4226
Drawn By: SDO Jr Date: 11/20/12

Custom Soil Resource Report
Soil Map



200

AGENDA REPORT

TO: MAYOR AND COUNCIL

FROM: DOMENICA PROTHEROE

SUBJECT: LEAK ADJUSTMENT REQUEST DECISIONS

DATE: 03/13/2014

SUMMARY
The City Council considered and approved four leak adjustments at the March 13, 2014 City Council Meeting.

- Beebe, Green Haven RV Park, Lamprecht & Sanders.

BACKGROUND
N/A

PREVIOUS COMMITTEE ACTION
The Public Works Committee helped to shape the current trial leak adjustment policy and Committee has reviewed all City Council decisions.

ALTERNATIVES/FINANCIAL IMPLICATIONS
The four leak adjustments totaled $345.38.

STAFF RECOMMENDATION
N/A

EXHIBIT
Exhibit A – City Council Agenda Report for Beebe Leak Adjustment Request
Exhibit B – City Council Agenda Report for Green Haven RV Park Leak Adjustment Request
Exhibit C – City Council Agenda Report for Lamprecht Leak Adjustment Request
Exhibit D – City Council Agenda Report for Sanders Leak Adjustment Request

PROPOSED MOTION
N/A

Exhibit A

AGENDA REPORT

TO: MAYOR AND COUNCIL

FROM: AMBER MATHIESEN, CITY ADMINISTRATOR

SUBJECT: LEAK ADJUSTMENT REQUEST

DATE: 02/18/2014

SUMMARY

Mr. Beebe submitted a leak adjustment request to City Hall. The leak caused the monthly usage to jump to 54,000 gallons in January amounting in a $159.03 water charge.

The customer provided proof of repair.

BACKGROUND

Falls City's water ordinance requires all leak adjustment requests be presented to the Council.

To date, we've tested two typical methods of leak adjustments. The first was where we adjusted a customer's bill to 1.5 times the average usage. The Public Works Committee thought the adjustments were too generous using this calculation. To address their concerns, the new trial adjustment calculation considers the 12 month average water charge including the month where the leak occurred.

The trial leak adjustment policy considers an adjustment to a single month water charge, in this case the January 2014 charge of $159.03 for 430 Montgomery Street.

Average water bill amount over 12 months	$ 72.67	
Multiply the average bill amount by 1.5 times	$ 109.01	= Calculated base for adjustment
Actual water service charge for month of leak	**$ 159.03**	
Subtracted by the calculated base for adjustment	$ 109.01	
Credit Amount	**$ 50.02**	

PREVIOUS COUNCIL ACTION

The Council has not taken previous action on this request. Past requests have been evaluated on a case by case basis.

ALTERNATIVES/FINANCIAL IMPLICATIONS

The financial impact to the city would be a charge waiver of $50.02.

STAFF RECOMMENDATION

Staff recommends the Council allow staff to issue refund in the form of a credit to the utility account in the amount of $50.02.

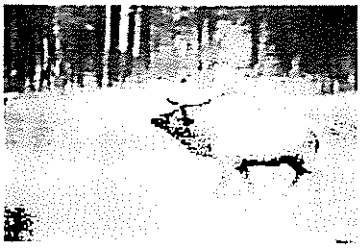
EXHIBIT
Exhibit A – Proof of Repair.

PROPOSED MOTION
I move the City Council of the City of Falls City allow staff to issue refund in the form of a credit to the Beebe account in the amount of $50.02.

Robert Young Construction

CCB 182842

PO Box 127 Falls City, Or 97344
(503) 910-2414 or (503) 787-3316 – home



INVOICE

Date: 2/6/14

Job: Beebe 430 Mint

Material: $300. Trencher + pipe & fittings

Total:

Labor: Plumber 8 hrs at $80. $320.
Misc Labor 6 hrs at $40

Total: $480.

Miscellaneous: $38. fittings

Total Due: $898.00

Thank you!

204

Exhibit B

AGENDA REPORT

TO: MAYOR AND COUNCIL

FROM: AMBER MATHIESEN, CITY ADMINISTRATOR

SUBJECT: LEAK ADJUSTMENT REQUEST

DATE: 03/5/2014

SUMMARY

Mr. Bowman submitted a leak adjustment request on February 28, 2014 for Green Haven RV Park to City Hall. The leak was located during the heavy snow and was repaired. The leak caused the monthly usage to jump to 113,000 gallons in February amounting in a $424.44 water charge.

The customer provided proof of repair.

BACKGROUND

Falls City's water ordinance requires all leak adjustment requests be presented to the Council.

To date, we've tested two typical methods of leak adjustments. The first was where we adjusted a customer's bill to 1.5 times the average usage. The Public Works Committee thought the adjustments were too generous using this calculation. To address their concerns, the new trial adjustment calculation considers the 12 month average water charge including the month where the leak occurred.

The trial leak adjustment policy considers an adjustment to a single month water charge, in this case the February 2014 charge of $424.44 for 200 Church Street.

Average water bill amount over 12 months	$ 230.40	
Multiply the average bill amount by 1.5 times	$ 345.62	= Calculated base for adjustment
Actual water service charge for month of leak	**$ 424.44**	
Subtracted by the calculated base for adjustment	$ 345.62	
Credit Amount	**$ 78.82**	

PREVIOUS COUNCIL ACTION

The Council has not taken previous action on this request. Past requests have been evaluated on a case by case basis.

ALTERNATIVES/FINANCIAL IMPLICATIONS

The financial impact to the city would be a charge waiver of $78.82.

STAFF RECOMMENDATION

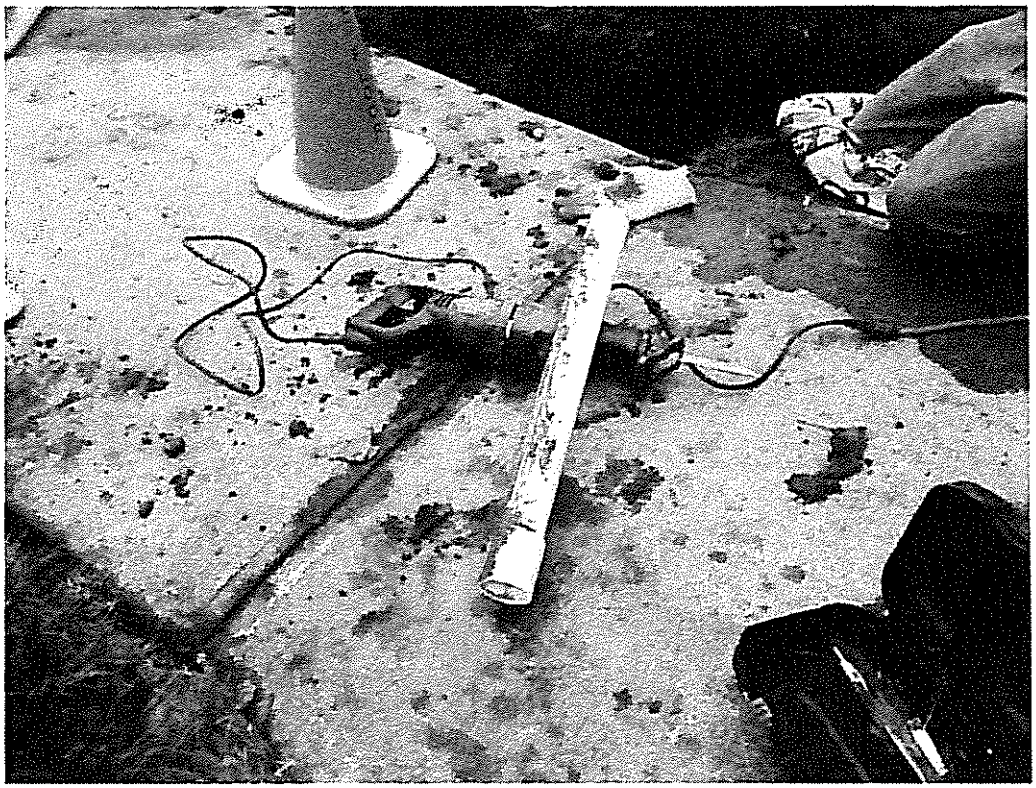
Staff recommends the Council allow staff to issue refund in the form of a credit to the utility account in the amount of $78.82.

EXHIBIT
Exhibit A – Proof of Repair.

PROPOSED MOTION
I move the City Council of the City of Falls City allow staff to issue refund in the form of a credit to the Green Haven RV Park account in the amount of $78.82.

Received 2/28/2014
Green Haven RV Park

207



208

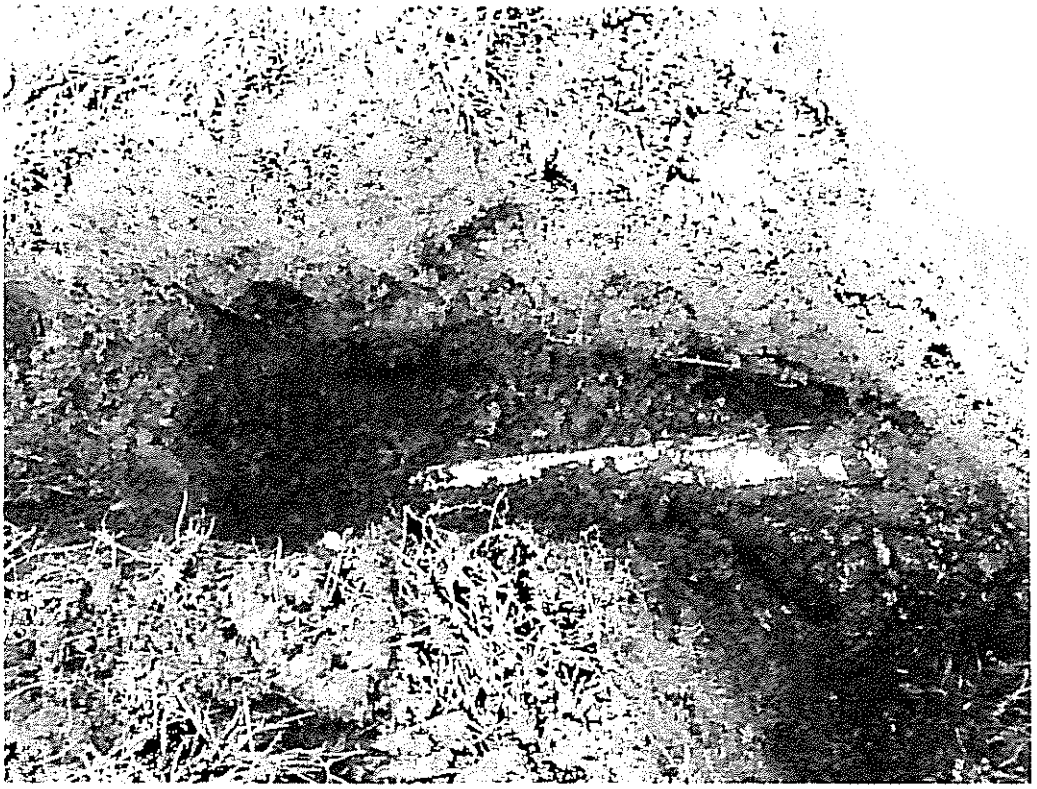


Exhibit C

AGENDA REPORT

TO: MAYOR AND COUNCIL

FROM: AMBER MATHIESEN, CITY ADMINISTRATOR

SUBJECT: LEAK ADJUSTMENT REQUEST

DATE: 03/5/2014

SUMMARY

Mr. Lamprecht submitted a leak adjustment request to City Hall. The leak caused the monthly usage to jump to 34,000 gallons in December amounting in a $110.43 water charge.

The customer provided proof of repair.

BACKGROUND

Falls City's water ordinance requires all leak adjustment requests be presented to the Council.

To date, we've tested two typical methods of leak adjustments. The first was where we adjusted a customer's bill to 1.5 times the average usage. The Public Works Committee thought the adjustments were too generous using this calculation. To address their concerns, the new trial adjustment calculation considers the 12 month average water charge including the month where the leak occurred.

The trial leak adjustment policy considers an adjustment to a single month water charge, in this case the December 2013 charge of $110.43 for 970 Mitchell Street.

Average water bill amount over 12 months	$ 45.12	
Multiply the average bill amount by 1.5 times	$ 67.68	= Calculated base for adjustment
Actual water service charge for month of leak	**$ 110.43**	
Subtracted by the calculated base for adjustment	$ 67.68	
Credit Amount	**$ 42.75**	

PREVIOUS COUNCIL ACTION

The Council has not taken previous action on this request. Past requests have been evaluated on a case by case basis.

ALTERNATIVES/FINANCIAL IMPLICATIONS

The financial impact to the city would be a charge waiver of $42.75.

STAFF RECOMMENDATION

Staff recommends the Council allow staff to issue refund in the form of a credit to the utility account in the amount of $42.75.

EXHIBIT
Exhibit A – Proof of Repair.

PROPOSED MOTION
I move the City Council of the City of Falls City allow staff to issue refund in the form of a credit to the Lamprecht account in the amount of $42.75.

970 Mitchell

Boyd Lamprecht

12-30-2014

Paid Cash $400.00

Petersons Plumbing

1 inch plastic Pipe

CUSTOMER COPY SIDE 2

THIS IS A CONTRACT

THE WORDS RENTER, BUYER, YOU AND YOUR MEANS THE PERSON WHO SIGNS THIS CONTRACT (OR ARE OBLIGATED UNDER ITS TERMS). WE, OUR AND DEALER REFER TO THE BUSINESS NAMED AT RIGHT.

GENERAL RENTAL CENTER OF DALLAS
167 S.W. CLAY STREET
DALLAS, OREGON 97338
TEL: 503/623-0458 FAX: 503/623-9104

TERMS: CASH IN ADVANCE

ESTABLISHED OPEN ACCOUNTS ARE DUE AND PAYABLE NET 10TH OF MONTH. PAST DUE ACCOUNTS BEAR LATE PAYMENT PENALTIES AT 1-1/2% PER MONTH

CONTRACT

SOLD TO: LAMPRECHT LOGGING
970 MITCHELL ST
FALLS CITY OR 97344

CONTRACT #: 95727
DATE PRINTED: 12/30/2013 09:17

REF: BOYD LAMPRECHT

SHIP TO: LAMPRECHT LOGGING
970 MITCHELL ST
FALLS CITY OR 97344

SITE: 503-787-3206
CUSTOMER: 379
TEL: 503-787-3206
TERMS: NET DUE 10TH

CUSTOMER PICKUP

PAGE: 1 GAS
DATE DUE 12/30/2013

PRODUCT #	DESCRIPTION	RATE PER UNIT MINIMUM	HOURLY	DAILY	WEEKLY	4 WEEKS	DATE/TIME OUT	QTY	AMOUNT
1301-07	TRENCHER W/B BARPETO 1324ST SER#:ST0140	110.00		160.00	620.00	1400.00	MON DEC 30/13 9:15AM DUE:MON DEC 30/13 2:15PM	1	110.00
							FUEL GASOLINE	1	7.00
	TOT RENTALS: 110.00	TOT SALES: .00		TOT SERVICES: 7.00			SUBTOTAL: NO TAX		117.00
							TOTAL:		117.00
DEPOSIT: CASH	117.00 12/30/13						DEPOSIT:		117.00

I, the undersigned renter, specifically acknowledge that I have received and understand the instructions regarding the use and operation of the rented equipment.
Renter further acknowledges that he has read and fully understands the within equipment rental contract and agrees to be bound by all of the terms, conditions and provisions hereof. Renter acknowledges that he has received a true and correct copy of this agreement at the time of execution hereof.

I accept/decline the damage waiver, as provided on the reverse side and agree to pay the above described additional charges therefor

IF DECLINED PLEASE INITIAL

RETURN EQUIPMENT BY

X _____
SIGNATURE

THIS IS YOUR CONTRACT, READ BOTH SIDES BEFORE SIGNING

213

CUSTOMER COPY SIDE 2

200.00

THIS IS A CONTRACT

THE WORDS 'RENTER', 'BUYER', 'YOU' AND 'YOUR' MEANS THE PERSON WHO SIGNS THIS CONTRACT (OR ARE OBLIGATED UNDER ITS TERMS). 'WE', 'OUR' AND 'DEALER' REFER TO THE BUSINESS NAMED AT RIGHT.

GENERAL RENTAL CENTER OF DALLAS

GENERAL RENTAL CENTER OF DALLAS
167 S.W. CLAY STREET
DALLAS, OREGON 97338
TEL: 503/623-0458 FAX: 503/623-9104

TERMS: CASH IN ADVANCE

ESTABLISHED OPEN ACCOUNTS ARE DUE AND PAYABLE NET 10TH OF MONTH. PAST DUE ACCOUNTS BEAR LATE PAYMENT PENALTIES AT 1 1/2% PER MONTH.

5 hrs
117.00

CONTRACT

LL-TO: LAMPRECHT LOGGING
970 MITCHELL ST
FALLS CITY OR 97344

CONTRACT #: 95717
DATE PRINTED: 12/26/2013 08:23

REF: BOYD LAMPRECHT

IP TO: LAMPRECHT LOGGING
970 MITCHELL ST
FALLS CITY OR 97344

SITE: 503-787-3206
CUSTOMER: 379
TEL: 503-787-3206
TERMS: NET DUE 10TH

CUSTOMER PICKUP

PAGE: 1 GAS
DATE DUE 12/27/2013

PRODUCT #	DESCRIPTION		MINIMUM	HOURLY	DAILY	WEEKLY	4 WEEKS	DATE/TIME OUT	QTY	AMOUNT
			RATE PER UNIT							
1302-01	TRENCHER RIDING ASTEC RT460		200.00		260.00	1200.00	2300.00	THU DEC 26/13 8:22AM	1	260.00
	SER#:TRHD4550683							DUE:FRI DEC 27/13 8:22AM		
	METER OUT: 1176.40	INCL:	4.00		8.00	40.00	160.00			
		O/T:	50.00		32.50	30.00	22.50			

TOT RENTALS: 260.00 TOT SALES: .00 TOT SERVICES: .00 SUBTOTAL: 260.00
NO TAX

TOTAL: 260.00

DEPOSIT: CASH 260.00 12/26/13

DEPOSIT: 260.00

I, the undersigned renter, specifically acknowledge that I have received and understand the instructions regarding the use and operation of the rented equipment.
Renter further acknowledges that he has read and fully understands the within equipment rental contract and agrees to be bound by all of the terms, conditions and provisions hereof. Renter acknowledges that he has received a true and correct copy of this agreement at the time of execution hereof.

I accept/decline the damage waiver, as provided on the reverse side and agree to pay the above described additional charges therefor.

IF DECLINED PLEASE INITIAL

RETURN EQUIPMENT BY

X _____ SIGNATURE

THIS IS YOUR CONTRACT, READ BOTH SIDES BEFORE SIG

214

Exhibit D

AGENDA REPORT

TO: MAYOR AND COUNCIL

FROM: AMBER MATHIESEN, CITY ADMINISTRATOR

SUBJECT: LEAK ADJUSTMENT REQUEST

DATE: 03/6/2014

SUMMARY

Ms. Sanders submitted a leak adjustment request to City Hall. The leak caused the use to jump to 96,000 gallons in February amounting in a $261.09 water charge.

The customer provided proof of repair.

BACKGROUND

Falls City's water ordinance requires all leak adjustment requests be presented to the Council.

To date, we've tested two typical methods of leak adjustments. The first was where we adjusted a customer's bill to 1.5 times the average usage. The Public Works Committee thought the adjustments were too generous using this calculation. To address their concerns, the new trial adjustment calculation considers the 12 month average water charge including the month where the leak occurred.

The trial leak adjustment policy considers an adjustment to a single month water charge, in this case the February 2014 charge of $261.09 for 140 Sheldon Ave.

Average water bill amount over 12 months	$ 58.20	
Multiply the average bill amount by 1.5 times	$ 87.30	= Calculated base for adjustment
Actual water service charge for month of leak	**$ 261.09**	
Subtracted by the calculated base for adjustment	$ 87.30	
Credit Amount	**$ 173.79**	

PREVIOUS COUNCIL ACTION

The Council has not taken previous action on this request. Past requests have been evaluated on a case by case basis.

ALTERNATIVES/FINANCIAL IMPLICATIONS

The financial impact to the city would be a charge waiver of $173.79.

STAFF RECOMMENDATION

Staff recommends the Council allow staff to issue refund in the form of a credit to the utility account in the amount of $173.79

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EXHIBIT
Exhibit A – Proof of Repair.

PROPOSED MOTION
I move the City Council of the City of Falls City allow staff to issue refund in the form of a credit to the Sanders account in the amount of $173.79.

March 6, 2014

City of Falls City
299 Mill Street
Falls City, OR 97344

RE: WATER BILL/WATER-LINE BREAK

City Counsil:

In regard to my unusual water bill in amount of $271.59, covering statement dates of service from Jan.-24-2014 to Feb.-26-2014, due to a water-line break on my property sometime during this duration that I was not aware of, until our deep snowfall and inclement weather had passed and snow melted. I, then, was made aware of the water-line break. At which time I turned the water meter off at the road.

My daughter and I made the needed repair. The day we completed the repair, my daughter had left, approximately, an hour prior to Don an Corky checking the meters. Don alerted me that I had a water leak somewhere; my meter, showing an unusual usage, considering my usual usage. I told them we had just finished the repair and showed them the (yet, open) ditch where we repaired the leak.

My monthly water bill average is usually around $50.00 per month. Because of the situation, I am submitting this request, asking that Council/City Hall take this into consideration and adjust this amount of $271.59, back to the amount of $50.00; the average amount of this service period (1-24-14 to 2-25-14).

Thank you.

Donna Sanders
140 Sheldon Ave.
Falls City, OR 97344
(P.O. Box 218)

Donna Sanders
3-6-14

AGENDA REPORT

TO: Parks and Recreation (Cemetery) Committee and Public Works Community

FROM: Domenica Protheroe, City Clerk

SUBJECT: New City Councilor Selected - Dennis Sickles

DATE: 03/14/2014

SUMMARY

Falls City City Council selected Dennis Sickles to fill the open position. Councilor Dennis Sickles was appointed to the Parks and Recreation (Cemetery) Committee.

PREVIOUS COMMITTEE ACTION

N/A

STAFF RECOMMENDATION

N/A

EXHIBIT

N/A

PROPOSED MOTION

N/A