Eugene Water & Electric Board
500 East 4th Avenue/Post Office Box 10148
Eugene, Oregon 97440-2148
541-685-7000
www.eweb.org

December 20, 2016

Dwight French
Oregon Water Resources Department
725 NE Summer Street, Suite A
Salem, OR 97301

RE: Evidence of use for SWR-354, in the name of Eugene Water & Electric Board

Dear Mr. French,

On December 30, 1992, the Oregon Water Resources Department (OWRD) received from the City of Eugene, acting through the Eugene Water & Electric Board (EWEB), a surface water registration for a pre-1909 vested water right claim (SWR-354). The surface water registration claimed a water right for the use of 30.9 cfs from the Willamette River for year-round municipal purposes. SWR-354 indicated that water use development was initiated as of no later than November 3, 1886, and that water was first used on March 26, 1887. The map submitted in support of SWR-354 identified the locations of two points of diversion on the Willamette River.

On March 24, 2014, OWRD received from EWEB a request to amend SWR-354, which requested to add a point of diversion (POD #5). The requested additional point of diversion is located upstream from the two points of diversion originally included in SWR-354, and this reach of the Willamette River has an instream water right (evidenced by Certificate 59549) that is not always met. To resolve concerns regarding injury to the instream water right resulting from the addition of POD #5 to SWR-354, EWEB also requested to change the character of use for a 1.5 cfs portion of SWR-354 to instream use and assigned that portion of the surface water registration to the State of Oregon. (The priority date of the 1.5 cfs portion was also diminished by one minute.) On April 15, 2014, OWRD issued a letter stating that the agency had found that EWEB's amendment to SWR-354 would not cause injury to other water rights holders, net loss of water available to downstream use, or an expansion of the right. Based on these conclusions, OWRD included the amendment in its records for SWR-354.

On June 23, 2016, EWEB, on behalf of the City of Eugene, submitted a second request to amend SWR-354. The amendment requested to add a point of diversion (POD #6) to the surface water registration. The watermaster's review of the proposed change indicated that it would not cause injury to other water rights or net loss of water

Rely on us.

available to downstream users. On July 6, 2016, OWRD indicated that the requested amendment was included in the agency's records for SWR-354.

As described in the surface water registration statement, water was first used under this vested pre-1909 right in March 1887. In 1927, EWEB made the McKenzie River its primary source of supply for municipal purposes in the City of Eugene. Although the Willamette River is not currently the City's primary source of municipal water supply, EWEB maintains its intention to retain and use its Willamette River water right. Moreover, water has been used on multiple occasions under SWR-354 after the McKenzie River became EWEB's primary source of supply. As evidence of its ongoing intention to maintain and use its water right evidenced by SWR-354, EWEB has requested a certified water rights examiner (CWRE) from GSI Water Solutions, Inc. to document water use under the surface water registration. A copy of the CWRE's report is enclosed.

EWEB requests that the enclosed CWRE report on water use under SWR-354 be included in OWRD's record for its surface water registration to document the intention to maintain and use this right.

Please contact me if you have any questions or wish to discuss this request.

Sincerely,

Brad Taylor
Water Operations Manager
Eugene Water and Electric Board

Enclosure

cc: File SWR-354
Adam Sussman, GSI Water Solutions

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GSI Water Solutions, Inc.

MEMORANDUM

To:	Brad Taylor – Eugene Water & Electric Board
From:	Ted Ressler, RG, CWRE – GSI Water Solutions, Inc.
CC	Adam Sussman – GSI Water Solutions, Inc. Kim Grigsby – GSI Water Solutions, Inc.
Date:	December 20, 2016
Re:	**Report on documented use of Surface Water Registration SWR 354**

On October 10, 2016, I visited the Delta Sand & Gravel, Inc. (Delta) facility in Eugene, Oregon to observe and document the diversion and use of water from the Willamette River under Eugene Water & Electric Board's (EWEB) surface water registration SWR 354. This memorandum provides a summary of my observations of the diversion of water under SWR 354, for use by Delta, including documentation of the diversion facility, the rate of diversion, and conveyance system on the day of my visit.

Diversion and Conveyance System

Water for Delta's facility is diverted from the Willamette River using two line shaft turbine pumps and is conveyed by pipe to the gravel washing plant. The pumps are installed in separate concrete caisson/wet wells, each with a single horizontal lateral extending out into the river at the level of the streambed. The end of the horizontal lateral from each wet well is equipped with a bar rack and debris screen. The 12-inch mainline from Pump 1 (upsized from 10-inch pump discharge) and the 10-inch mainline from Pump 2 (upsized from 8-inch pump discharge) convey water to the gravel washing plant where the two mainlines manifold to a single 12-inch mainline supply water to the plant.

Diversion Pumps

Pump ID	#1	#2
Brand	Berkeley	Peabody Floway
Model	1404H (3 stage)	14DKM
Type	Vertical turbine	Vertical turbine
Pump column	10-inch	8-inch
Motor Brand	General Electric	Newman
Motor Horsepower	200	150
Design Point	3000 gpm @ 220' TDH	2100 gpm @ 220' TDH

Point of Diversion and Place of Use

The intake for the diversion pumps corresponds with POD #6 of EWEB's SWR 354 (Attachment 1). Delta's facility where was being used on the date of my visit is located within the authorized place of use of EWEB's SWR 354 (Attachment 1).

Observed Rate of Water Use

Delta's diversion and conveyance system does not include a flow meter. The measurement of flow rate was made using the calculated total dynamic head (TDH) under which the diversion pumps were operating during my visit and the performance specifications of the diversion pumps. Based on this method, the calculated rate of diversion on October 10, 2016 was 8.62 cfs (3869 gpm). This calculated rate of diversion is likely an overestimate of the actual water diversion rate as it does not fully account for the frictional losses in the pipeline (e.g., pipe fittings, valves, elbows, etc.) or current pump condition (e.g., pump impeller wear, etc.). The water diverted was being used by Delta for its aggregate mining operation.

The TDH under which the diversion pumps were operating is calculated as follows:

TDH = Pumping Lift (ft) + Operational Pressure (ft) + Frictional Losses (ft)

Where,

- Pumping lift (elevation change between pumping water level and pump discharge) = 30 ft
- Operational pressure at manifold connection of mainlines from each pump= 110 psi
- Frictional losses (estimated, refer to Attachment 2) = 5.1 ft and 6.5 ft, respectively, for conveyance system of Pump 1 and Pump 2 upstream of manifold connection.

Using the TDH, the rate of water use was determined using the performance specifications of the diversion pumps as follows:

$$\text{Production rate of pump in cfs} = \frac{(\text{Pump Horsepower})(\text{Pump Efficiency Factor})}{(\text{Feet TDH})}$$

Pump Efficiency Factor = Design Production Rate (cfs) × Design TDH (ft) ÷ Pump Horsepower

Pump 1 = 6.68 × 220 ÷ 200 = 7.35

Pump 2 = 4.68 × 220 ÷ 150 = 6.86

(For comparison, OWRD's standard pump efficiency factor for vertical turbine pumps is 7.04)

Pump 1

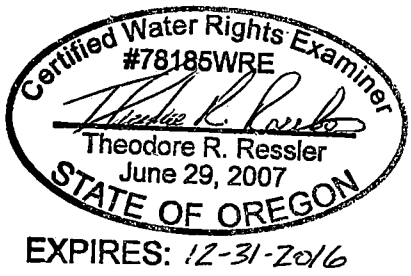
$$Q_{pump} = \frac{(200)(7.35)}{[30 + (110 \times 2.31) + 5.1]} = \underline{\mathbf{5.08\ cfs}}$$

Pump 2

$$Q_{pump} = \frac{(150)(6.86)}{[30 + (110 \times 2.31) + 6.5]} = \underline{\mathbf{3.54\ cfs}}$$

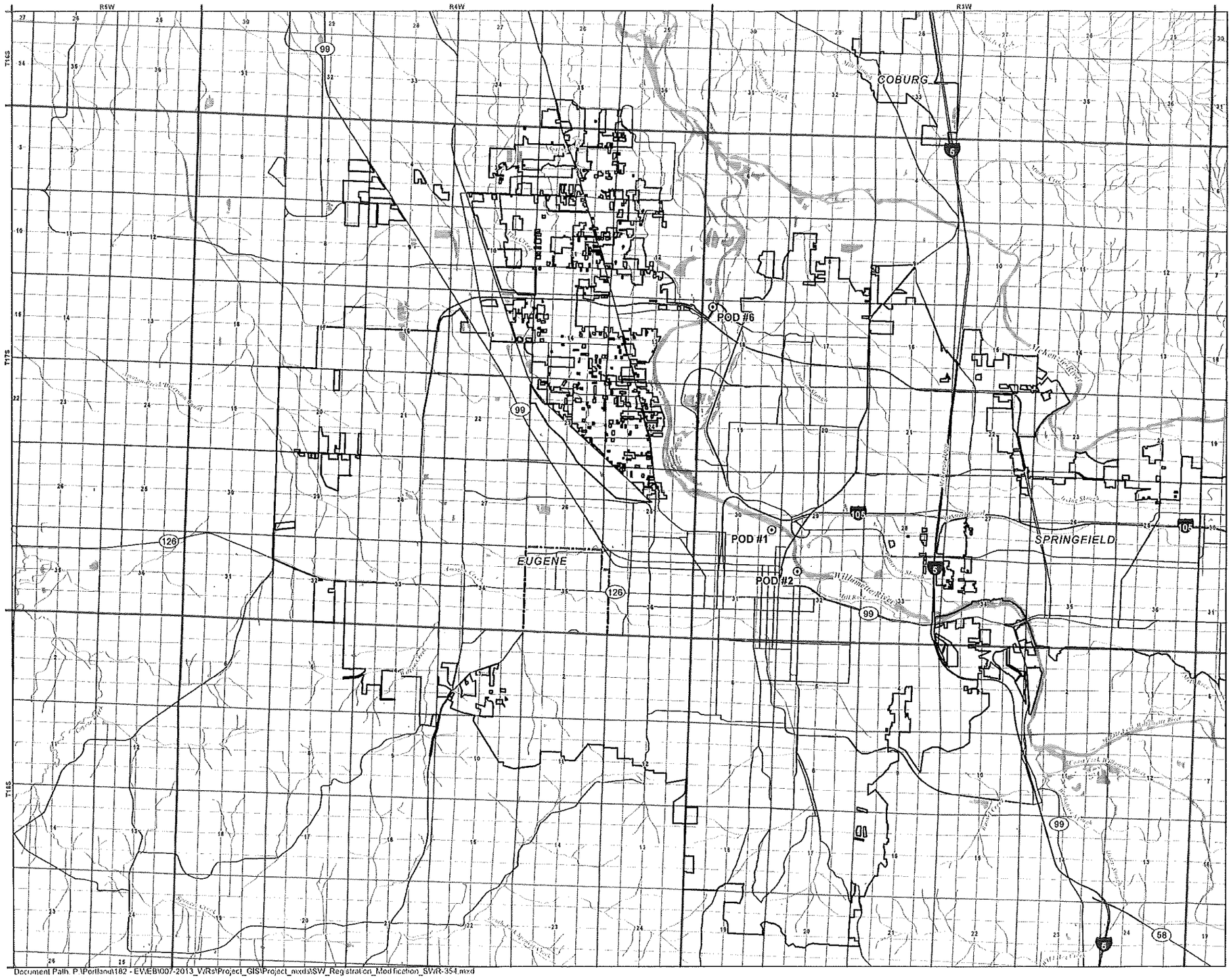
The facts presented in this memorandum are correct to the best of my knowledge.

CWRE Seal and Signature



EXPIRES: 12-31-2016

Attachment 1
Maps



Surface Water Registration Modification (SWR-354) In the Name of: Eugene Water & Electric Board

Legend

- Proposed Point of Diversion (POD)
- City Limits
- Hilyard Shaw DLC 56
- Major Roads
- Watercourses
- Waterbodies

POD Location Descriptions

POD #1
1710' North and 555' West of SE Cor. Section 30, T.17S., R.3W., W.M.

POD #2
NW1/4 NW1/4, as projected within Hilyard Shaw DLC 56, Section 32, T.17S., R.3W., W.M.; 843 feet South and 1123 feet East from the NW Corner, Hilyard Shaw DLC 56

POD #6
402' South and 626' East of NW Cor. of Section 18, T.17S., R.3W., W.M.

N

0 3000 6000 9000
Feet

Disclaimer
This map was prepared for the purpose of identifying the location of a water right only and it is not intended to provide legal dimensions or location of property ownership lines.

Map Notes
Date: June 20, 2016
Data Sources: EWEB, OWRD, OGIC
Prepared By: GSI Water Solutions, Inc.

GSI Water Solutions, Inc.

Document Path: P:\Portland\82 - EWEB\007-2013_WRs\Project_GIS\Project_mxds\SW_Registration_Modification_SWR-354.mxd

RECEIVED

DEC 3 0 1992

WATER RESOURCES DEPT.
SALEM, OREGON

STATE OF OREGON
WATER RESOURCES DEPARTMENT

SURFACE WATER REGISTRATION STATEMENT
PRE-1909 VESTED WATER RIGHT CLAIM

1. Name of Registrant: The City of Eugene acting by and through the Eugene Water & Electric Board
   Mailing Address: P.O. Box 10148, Eugene, OR 97440
   Telephone No: (503) 484-2411

2. Source of water: Willamette River
   Tributary to: Columbia River

3. Purpose(s) for which water is used: Municipal Purposes
   (Irrigation, Stockwater, Domestic, Hydroelectric power, Industrial, Etc.)
   If irrigation, total number of acres irrigated: N/A

4. Priority Date
   a) Date of first use: March 26, 1887
   b) Date water use development first initiated: No later than Nov. 3, 1886
   c) Name of party who initiated development: T.W. Shelton & Charles Lauer

5. Amount of water claimed: 30.9*, in (CFS) or GPM
   (Water put to beneficial use)

6. Location of place of use:
   *All Sections, Township 17 N/(S) Range 3 & 4 E/(W)
   *All Sections, Township 18 N/(S) Range 3 & 4 E/(W)
   (Attach additional pages if necessary)

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JAN 18 2017
SALEM, OR

7. Usual period of use: Jan. / 1 (month / day) to Dec. / 31 (month / day)

* All sections within the present and future city limits of the City of Eugene including those sections in Township 16S, Range 4W and Township 17S, Range 5W.

8. Remarks: _____

9. Total fees submitted with claim: $1,700

Notarized Statement Signed by Claimant.

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JAN 18 2017

SALEM, OR

STATE OF OREGON)
: ss
County of Lane)

I, THOMAS E. RUCKHOUSE, having been duly sworn, depose and say that I, and being the claimant of the existing surface water right described herein, have read the contents of this claim and to the best of my knowledge all of the matters stated herein are true and correct.

Thomas E. Ruckhouse
Signature of Claimant

Signed and attested before me this ~~29th~~ 30th day of December, 19 92

OFFICIAL SEAL
MARK D. OBERLE
NOTARY PUBLIC - OREGON
COMMISSION NO.016192
MY COMMISSION EXPIRES OCT. 23, 1996

Mark D Oberle
NOTARY PUBLIC for the State of Oregon
My commission expires: 10-23-96

THIS FORM MUST BE ACCOMPANIED BY A MAP PREPARED BY A CERTIFIED WATER RIGHT EXAMINER (CWRE).

Certified Water Right Examiner

Name: Charles W. Guile CWRE#: 166

Address: 52 Centennial Loop, Eugene, OR 97401

Telephone: (503) 343-9855

T.16, 17 & 18 S., R.3, 4 & 5 W., W.M.

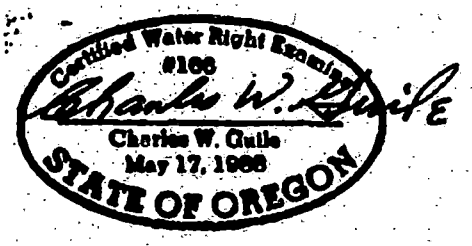
WATER RIGHT APPLICATION MAP FOR

EUGENE WATER & ELECTRIC BOARD

LANE COUNTY, OREGON

DECEMBER 29, 1992

CHARLES W. GUILE
& ASSOCIATES, CO.
Land Surveying
88 Centennial Loop
Eugene, OR 97401

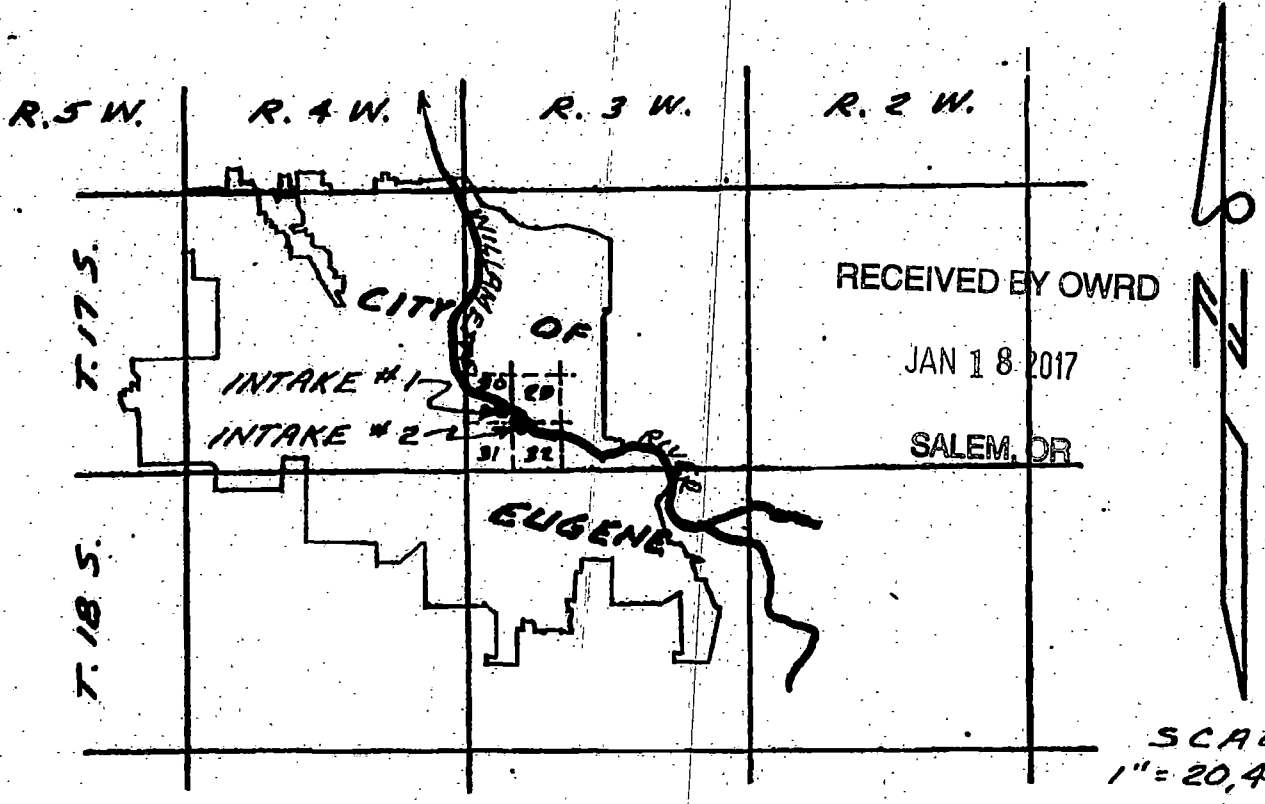


THIS MAP IS FOR WATER RIGHT PURPOSES ONLY AND DOES NOT PROVIDE DATA TO LOCATE PROPERTY BOUNDARIES.

DIVERSION POINTS:

INTAKE #1. 1710' NORTH & 555' WEST OF SE COR. SECTION 30, T.17S, R.3W, W.M.

INTAKE #2. 590' SOUTH & 930' EAST OF NW COR. SECTION 32, T.17S, R.3W, W.M.



PREPARED FROM RECORDS

92-89A

Attachment 2
Frictional Loss Calculations

Theoretical Flow Rate and Frictional Loss Calculator

PUMP 1

Parameters

TDH (less frictional losses)	284.1 ft
Pump horsepower	200
Pump efficiency factor	7.35

Pipe Sections	1	2
Pipe length (ft)	30	420
Pipe diameter (in)	10	12
Pipe material	Ductile iron	Ductile iron
Hazen-Williams roughness coefficient	140	140
	Pump column	*Mainline*

Iteration Step	Frictional Losses hf_1 (/ft)	hf_2 (/ft)	TDH (ft)	Calculated Q (cfs)
1	0.010000	0.010000	288.6	5.0952
2	0.024972	0.010285	289.2	5.0852
3	0.024882	0.010248	289.2	5.0855
4	0.024885	0.010249	289.2	5.0855
5	0.024884	0.010249	289.2	5.0855
6	0.024884	0.010249	289.2	5.0855
7	0.024884	0.010249	289.2	5.0855
8	0.024884	0.010249	289.2	5.0855
9	0.024884	0.010249	289.2	5.0855
10	0.024884	0.010249	289.2	5.0855
11	0.024884	0.010249	289.2	5.0855
12	0.024884	0.010249	289.2	5.0855
13	0.024884	0.010249	289.2	5.0855
14	0.024884	0.010249	289.2	5.0855
15	0.024884	0.010249	289.2	5.0855
16	0.024884	0.010249	289.2	5.0855
17	0.024884	0.010249	289.2	5.0855
18	0.024884	0.010249	289.2	5.0855
19	0.024884	0.010249	289.2	5.0855
20	0.024884	0.010249	289.2	5.0855

Equations used in calculation

Generalized pumping capacity equation (used by OWRD)

Q_{pump} (in cfs) = [Pump Horsepower] × [Pump Efficiency Factor] ÷ [TDH]

Generalized pumping capacity equation rearranged to solve for efficiency factor based on design TDH for pump

Pump Efficiency Factor = $Q_{design} \times TDH_{design}$ ÷ [Pump Horsepower]

Headloss per foot of pipe (Hazen and Williams)

$h_f/ft = 0.002083 \times (100 \times [Flow] \div [Roughness\ Coefficient])^{1.85} \times [Pipe\ Diameter]^{-4.8655}$

0.01 enter first guess of h_f/ft frictional loss for pipe sections

5.1 Calculated frictional losses

Notes:

Additional fictional losses due to pipeline fittings are not included, which would further reduce the calculated theoretical flow rate

Theoretical Flow Rate and Frictional Loss Calculator

PUMP 2

Parameters

TDH (less frictional losses)	284.1 ft
Pump horsepower	150
Pump efficiency factor	6.86

Pipe Sections	1	2
Pipe length (ft)	30	420
Pipe diameter (in)	8	10
Pipe material	Ductile iron	Ductile iron
Hazen-Williams roughness coefficient	140	140
	Pump column	*Mainline*

Iteration Step	Frictional Losses hf_1 (/ft)	hf_2 (/ft)	TDH (ft)	Calculated Q (cfs)
1	0.010000	0.010000	288.6	3.5667
2	0.038230	0.012909	290.7	3.5413
3	0.037728	0.012740	290.6	3.5423
4	0.037749	0.012747	290.6	3.5423
5	0.037748	0.012746	290.6	3.5423
6	0.037748	0.012746	290.6	3.5423
7	0.037748	0.012746	290.6	3.5423
8	0.037748	0.012746	290.6	3.5423
9	0.037748	0.012746	290.6	3.5423
10	0.037748	0.012746	290.6	3.5423
11	0.037748	0.012746	290.6	3.5423
12	0.037748	0.012746	290.6	3.5423
13	0.037748	0.012746	290.6	3.5423
14	0.037748	0.012746	290.6	3.5423
15	0.037748	0.012746	290.6	3.5423
16	0.037748	0.012746	290.6	3.5423
17	0.037748	0.012746	290.6	3.5423
18	0.037748	0.012746	290.6	3.5423
19	0.037748	0.012746	290.6	3.5423
20	0.037748	0.012746	290.6	3.5423

Equations used in calculation

Generalized pumping capacity equation (used by OWRD)

Q_{pump} (in cfs) = [Pump Horsepower] × [Pump Efficiency Factor] ÷ [TDH]

Generalized pumping capacity equation rearranged to solve for efficiency factor based on design TDH for pump

Pump Efficiency Factor = $Q_{design} \times TDH_{design}$ ÷ [Pump Horsepower]

Headloss per foot of pipe (Hazen and Williams)

$h_f/ft = 0.002083 \times (100 \times [Flow] \div [Roughness\ Coefficient])^{1.85} \times [Pipe\ Diameter]^{-4.8655}$

0.01 enter first guess of h_f/ft frictional loss for pipe sections

6.5 Calculated frictional losses

Notes:

Additional fictional losses due to pipeline fittings are not included, which would further reduce the calculated theoretical flow rate