



December 10, 2024

Kerri Cope
Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

RE: Water Management and Conservation Plan Progress Report for Roats Water System, Inc.

Dear Kerri,

The Oregon Water Resources Department (OWRD) issued a Final Order approving Roats Water System Water Management and Conservation Plan (WMCP) on December 31, 2019, which included a requirement that Roats Water System submit a progress report to OWRD by December 10, 2024. GSI Water Solutions, Inc. is submitting this progress report on behalf of Roats Water System (Roats) to meet that requirement.

This progress report includes the information required by OWRD: a description of progress toward meeting the Roats' conservation benchmarks, average monthly and average daily diversions by water rights, a comparison of water consumption by customer category over the past five years to consumption reported in the Roats WMCP, and annual water audit results.

Conservation Benchmarks

Exhibit 1 provides an update on progress made towards the Roats Water System's water management and conservation benchmarks outlined in the 2019 WMCP.

Water Use by Water Right and Wells

Exhibit 2 presents average monthly and daily appropriations under the Roats water rights for the 2019 through 2024 water years (6 years). **Exhibit 3** presents average monthly and daily water appropriations by wells for the same time period. The water production data is aggregated on a water year basis in order to match the Department's water use reporting system.

Consumption by Customer Category Comparison

Exhibit 4 presents annual metered water consumption by customer category from 2014 through 2024 water years. The number of connections in 2019 is used to compare to the number of connections for 2024 because the connections data for 2019 was more accurate than the number of connections for 2018 in the WMCP report.

Annual Water Audits

Exhibit 5 shows the results of Roats' annual water audits from 2019 through 2024 water years and presents water loss as a volume and a percentage. Reported water loss is the difference between production (measured at the wellheads) and metered customer consumption. The water loss percentage was calculated by dividing water loss by demand.

The total annual production data in Exhibit 5 differs from the annual withdrawal amounts in Exhibit 2 and 3 because the water from Roats' Well 10 is initially diverted into Avion Water Company's distribution system, rather than into Roats' distribution system. Roats then receives varying amounts of water supply from Avion's system throughout the year. The production data in Exhibit 5 presents the amount of water actually entering Roats Water System's distribution system.

Water Loss Remedies Update

Due to challenges with measuring inflows through Roats' interconnections with Avion, calculated water losses were negative in 2015, 2016, and 2018. Roats' approved WMCP included a benchmark that Roats would work to confirm the cause of negative water loss estimates, and that within five years from WMCP approval it would provide the Department with a description of activities and audit results from 2019 through the first full year after any meter issues had been resolved. Roats submitted a letter in compliance with that benchmark in January 2023. As shown in the data in Exhibit 5, issues affecting Roats' metering and water loss accounting were resolved by late 2020, with 2021 providing a full year of data consistent with its current water meters and water audit procedures.

If you have any questions regarding the enclosed information, feel free to call me at 541-740-5619.

Sincerely,

GSI Water Solutions, Inc.



Owen McMurtrey
Water Resources Consultant

Exhibit 1. Conservation Benchmarks Progress

Section Requirement	Sub-section Requirement	2019 Five-Year Water Conservation Benchmarks	2024 Water Conservation Benchmark Status
<p>OAR 690-086-150 (4) A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers:</p>	<p>(a) An annual Water Audit that includes a systematic and documented methodology for estimating any un-metered authorized and unauthorized uses, and an analysis of the water supplier's own water use to identify alternatives to increase efficiency.</p>	<p>Roats will continue to conduct annual water audits.</p>	<p>Roats completes its own water audits using calendar year water production and sales data each January. Water audits showed losses ranging from 3 to 9 percent from 2020 through 2023 and 11 percent in 2019. GSI also independently audits Roats' water production and water sales data for each water year between October and December of each year. GSI's water loss audits have identified losses between 1 and 4 percent from 2021 through 2024.</p>
	<p>(b) If the system is not fully metered, a program to install meters on all un-metered Water Service Connections. The program shall start immediately after the plan is approved and shall identify the number of meters to be installed each year with full Metering completed within five years of approval of the water management and conservation plan.</p>	<p>Roats will continue to install meters at all new water connections.</p>	<p>All water connections in the system are metered.</p>
	<p>(c) A meter testing and maintenance program.</p>	<p>Roats will continue to investigate meters upon customers' requests and accounts that are flagged by Roats' billing software system. Meters suspected of inaccurate readings of usage will be either tested and repaired or replaced as necessary. Roats will continue to test its production and vault meters at interconnections and repair or replace these meters as necessary. When testing meters, Roats will evaluate meter accuracy based on American Water Works Association (AWWA) standards.</p>	<p>Between 2019 and 2024, 106 customer meters were flagged and replaced. Production meters are tested each year and none have been replaced. Roats has implemented new regular for vault meters.</p>
	<p>(d) A rate structure under which customers' bills are based, at least in part, on the quantity of water metered at the service connections.</p>	<p>Roats will continue to charge customers for the volume of water they use.</p>	<p>There were no changes in water rates between 2019 and 2021 and again in 2023. A rate increase was approved for January 1, 2022 and September 1, 2024. Roats' fee structure includes both a base fee and a commodity charge of \$1.19/100 cubic feet per month, with no usage allowance.</p>
	<p>(e) If the annual Water Audit indicates that the system's Water Losses exceed 10 percent, within two years of approval of the water management and conservation plan, the water supplier shall provide a description and analysis identifying potential factors for the loss and selected actions for remedy, if actions identified do not result in the reduction of Water Losses to 10 percent or less, within five years of approval of the water management and conservation plan, the water supplier shall: develop and implement a regularly scheduled and systematic program to detect and repair leaks in the transmission and distribution system using methods and technology appropriate to the size and capabilities of the Municipal Water Supplier or a line replacement program detailing the size and length of pipe to be replaced each year; or, develop and implement a water loss control program consistent with American Water Works Association's standards.</p>	<p>Within the next two years, Roats will work to confirm the cause of negative water loss estimates. If repair or replacement of the Parrell vault meter within the next two years does not resolve negative water loss estimates, Roats will test production and vault meters throughout the water system. Within the next five years, Roats will provide the Department with a description of activities, audit results from 2019 through the first full year after any meter issues have been resolved, and, if needed, a description and analysis of other potential factors for negative water loss estimates.</p> <p>If the described actions do not result in reduction of water losses to 10 percent or less within five years of approval of this WMCP, Roats will develop and implement a regularly scheduled and systematic program to detect and repair leaks in the transmission and distribution system or develop and implement a water loss control program consistent with AWWA standards.</p>	<p>The Parrell vault meter was not functioning properly and was replaced in summer of 2019. Multiple efforts were required to obtain accurate readings for water coming into the system via Roats' interconnections with Avion. In addition, water delivered to two Roats customers by the City of Bend had previously been accounted for only as water sales and not as water production (water entering the system), artificially reducing water loss and contributing to the negative loss estimates. Loss estimates have been between 0 and 10 percent since late 2020.</p>
	<p>(f) A public education program commensurate to the size of the Municipal Water Supplier to encourage efficient indoor and outdoor water use that includes regular communication of the supplier's water conservation activities and schedule to customers.</p>	<p>Roats will continue to implement its current water conservation measures. Starting in 2020, Roats will begin to offer leak detection kits to customers upon request. Starting in 2020, Roats will regularly inform customers of its water conservation activities and schedule through one of its existing outreach measures.</p>	<p>Conservation messages were included in CCR, printed on bills from April – September, and brochures made available at the office. No leak detection kits were distributed at the office. The website was updated each year with information about Roats' conservation activities.</p>

Exhibit 1. Conservation Benchmarks Progress (Continued)

Section Requirement	Sub-section Requirement	2019 Five-Year Water Conservation Benchmarks	2024 Water Conservation Benchmark Status
OAR 690-086-150 (3) A description of other conservation measures, if any, currently implemented by the water supplier, including any measures required under water supply contracts;			Other conservation activities not included in the 5-year benchmarks included working with landscapers and customer HOA's to reduce irrigation water use.

Exhibit 2. Monthly and Daily Diversions by Water Right (2019 – 2024 Water Years)

Water Right Information										Annual Withdrawal (MG)						Annual Monthly Withdrawal (MG)						Annual Daily Withdrawal (mgd)						
Application	Permit	Certificate	Priority Date	Authorized Completion Date	Use	Authorized Rate (cfs)	Source	Well-specific Rate (cfs)	Maximum Rate Utilized to Date (cfs)	2019	2020	2021	2022	2023	2024	2019	2020	2021	2022	2023	2024	2019	2020	2021	2022	2023	2024	
G-13072	G-12526	87656	8/10/1992	N/A	Quasi-Municipal	3.0	Well 3	0.25	3.0	1339	777	1019	682	1255	1181	111.6	64.7	84.9	56.8	104.6	98.4	3.67	2.13	2.79	1.87	3.44	3.24	
							Well 4	0.85																				
							Well 9	0.95																				
							Well 10	0.95																				
G-1961	G-1890	87657	3/23/1961	N/A	Group Domestic	0.5	Well 3	N/A	0.5	1339	777	1019	682	1255	1181	111.6	64.7	84.9	56.8	104.6	98.4	3.67	2.13	2.79	1.87	3.44	3.24	
					Supplemental Irrigation	0.16	Well 4		0.16																			
							Well 9																					
							Well 10																					
G-3328	G-3128	87658	12/22/1965	N/A	Group Domestic	0.5	Well 3	N/A	0.5	1339	777	1019	682	1255	1181	111.6	64.7	84.9	56.8	104.6	98.4	3.67	2.13	2.79	1.87	3.44	3.24	
					Supplemental Irrigation	0.06	Well 4		0.06																			
							Well 9																					
							Well 10																					
G-11983	G-11323	87659	11/6/1989	N/A	Quasi-Municipal	1.1	Well 5	N/A	1.1	266	297	300	287	285	327	22.2	24.8	25.0	23.9	23.8	27.2	0.73	0.81	0.82	0.79	0.78	0.90	
							Well 6																					
							Well 7																					
							Well 8																					
G-13809	G-18079		9/1/1994	10/1/2055	Quasi-Municipal	4.16	Hole Ten Well 1 & 2	N/A	2.9	23	34	143	219	189	143	1.9	2.8	11.9	18.2	15.7	12.0	0.06	0.09	0.39	0.60	0.52	0.39	

cfs = cubic feet per second; MG = million gallons; mgd = million gallons per day

Exhibit 3. Monthly and Daily Diversions by Water Source (2019 – 2024 Water Years)

Report ID	Facility name	Annual diversion by wells (MG)						Average monthly diversion by wells (MG/month)						Average daily diversion by wells (mgd)					
		2019	2020	2021	2022	2023	2024	2019	2020	2021	2022	2023	2024	2019	2020	2021	2022	2023	2024
4175	WELL 5 / WOODSIDE I N (DESC 5687)	142.24	143.21	139.25	122.23	140.54	125.62	11.85	11.93	11.60	10.19	11.71	10.47	0.39	0.39	0.38	0.33	0.39	0.34
25169	WELL 6 / WOODSIDE I S (DESC 5685)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25170	WELL 7 / WOODSIDE II E (DESC 5688)	104.65	121.59	119.94	102.53	116.18	148.61	8.72	10.13	9.99	8.54	9.68	12.38	0.29	0.33	0.33	0.28	0.32	0.41
25171	WELL 8 / WOODSIDE II W (DESC 831)	19.25	32.26	40.62	62.33	28.32	52.71	1.60	2.69	3.38	5.19	2.36	4.39	0.05	0.09	0.11	0.17	0.08	0.14
29887	WELL 3 / PINEBROOK S (DESC 5634)	0.00	0.00	0.00	0.00	16.95	29.33	0.00	0.00	0.00	0.00	1.41	2.44	0.00	0.00	0.00	0.00	0.05	0.08
29888	WELL 4 / PINEBROOK CTR (DESC 5626)	52.01	58.77	197.60	111.45	57.98	53.94	4.33	4.90	16.47	9.29	4.83	4.50	0.14	0.16	0.54	0.31	0.16	0.15
29889	WELL 9 / PINEBROOK CTR (DESC 8543)	14.80	26.72	174.61	51.18	20.13	10.70	1.23	2.23	14.55	4.27	1.68	0.89	0.04	0.07	0.48	0.14	0.06	0.03
29890	WELL 10 / PINEBROOK CTR (DESC 57243L-80460)	1272.59	691.25	646.76	519.48	1160.13	1087.00	106.05	57.60	53.90	43.29	96.68	90.58	3.49	1.89	1.77	1.42	3.18	2.97
64682	HOLE TEN WELL 1 (DESC 5655)	18.84	25.73	89.04	116.74	69.74	116.58	1.57	2.14	7.42	9.73	5.81	9.71	0.05	0.07	0.24	0.32	0.19	0.32
64683	HOLE TEN WELL 2 (DESC 5654)	4.07	8.24	53.48	102.04	118.83	26.84	0.34	0.69	4.46	8.50	9.90	2.24	0.01	0.02	0.15	0.28	0.33	0.07

MG = million gallons; mgd = million gallons per day
All data was downloaded from OWRD's water use reporting Web page.

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Exhibit 4. Annual Metered Consumption by Customer Category (MG), 2014-2024 Water Years

Water Year	Woodside Ranch (Residential)	Homeplace Residential	Homeplace Commercial	Total Residential	Total Commercial	Wholesale	Total
2014	85.8	158.1	82.1	244	82.1	0.0	326.0
2015	87.8	185.2	81.8	273	81.8	0.0	354.8
2016	87.4	163.1	91.8	250	91.8	0.0	342.3
2017	85.0	185.1	81.8	270	81.8	0.0	351.9
2018	95.3	228.7	92.5	324	92.5	0.0	416.5
2019	111.7	279.4	119.8	391	119.8	7.5	518.4
2020	117.3	300.9	113.0	418	113.0	11.1	542.3
2021	95.7	252.2	99.4	348	99.4	46.4	493.7
2022	76.0	215.3	107.2	291	107.2	71.3	469.7
2023	79.8	227.4	117.2	307	117.2	61.4	485.9
2024	83.6	219.3	119.3	302.9	119.3	46.7	468.9
Average, 2014 - 2018 (previous WMCP)	88.3	184.0	86.0	272.3	86.0	0.0	358.3
Average, 2019 - 2024	94.0	249.1	112.6	343.1	112.6	40.7	496.5
Connections, 2019	273	2014	192	2287	192	1	2480
Connections, 2024	274	2104	211	2378	211	1	2590

MG = million gallons.

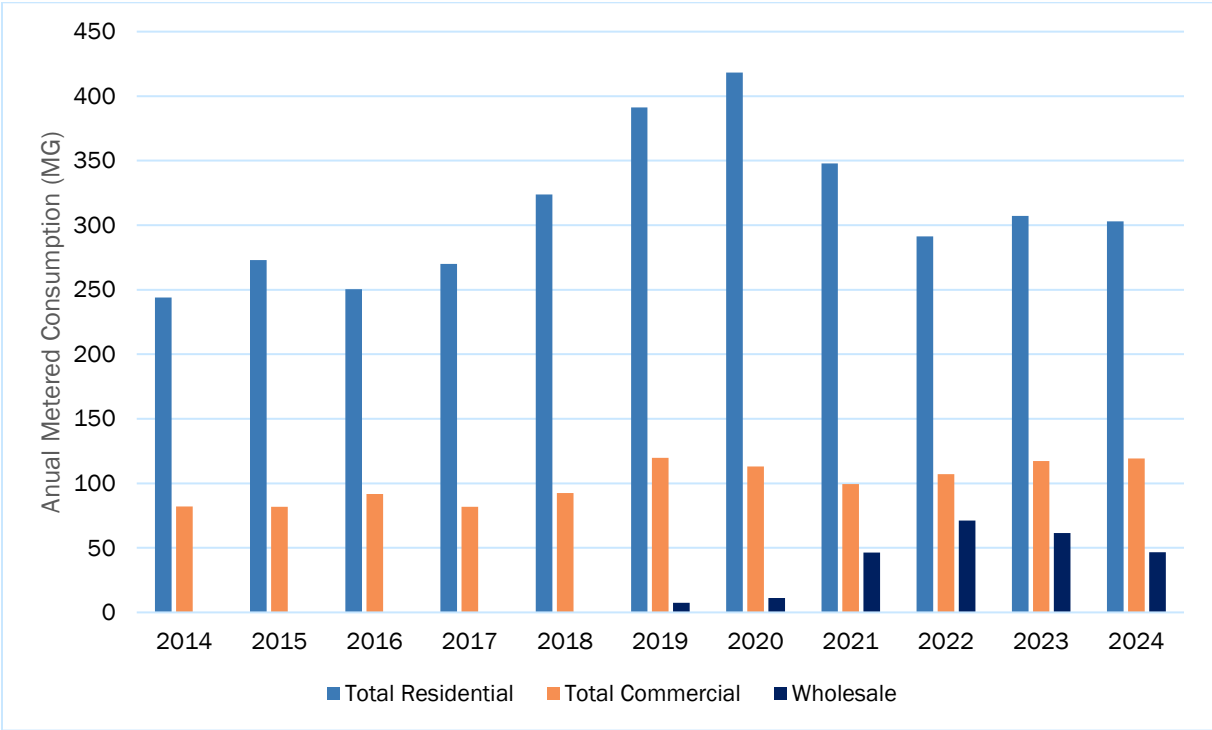


Exhibit 5. Results of Annual Water Audits (2019-2024 Water Years)

Water Year	Production (MG)					Total Annual Production (MG)	Annual Sales (MG)	Water Loss (MG)	Water Loss (%)
	Homeplace (Wells 3, 4, 9)	Woodside Ranch (Wells 5 through 8)	Avion Interties	Hole Ten Wells	City of Bend Wholesale Purchase				
2019	21.8	86.7	258.3	7.5	0.0	374.2	518.4	-144	-39%
2020	27.9	96.8	343.2	11.1	0.0	478.9	542.3	-63	-13%
2021	121.3	97.7	237.1	46.4	13.7	516.2	493.7	23	4%
2022	53.0	93.6	250.9	71.3	14.6	483.3	469.7	14	3%
2023	31.0	92.9	291.2	61.4	16.3	492.8	485.9	7	1%
2024	30.6	106.5	282.1	46.7	16.8	482.8	468.9	14	3%

MG = million gallons.