

DONALA WATER AND SANITATION DISTRICT
SPECIAL BOARD MEETING AGENDA
October 21, 2021

MEETING TIME & PLACE:

1:30 P.M.

DONALA WATER & SANITATION DISTRICT
15850 HOLBEIN DRIVE, COLORADO SPRINGS, CO 80921

BOARD MEMBERS: Ed Houle (via telephone)
 Wayne Vanderschuere
 Kevin Deardorff
 Bill George
 Ed Miller

STAFF: Jeff Hodge
 Tanja Smith
 Christina Hawker
 Mike Boyett

Agenda

1. Call to Order
2. Pledge of Allegiance
3. Approval of Agenda
4. Public Comment on Items not on the Agenda
5. Minutes from September 23, 2021, Regular Meeting
6. Financial Reports
7. Action Items:
 - a. LRE Well Field Study
 - b. Radium levels update
 - c. Budget
 - d. Potential drilling of 2 new wells
 - e. Forest Lakes Contract
8. Manager's Report
9. Status of Operations
 - a. Water
 - b. Wastewater
10. Executive Session C.R.S. § 24-6-402(4)(e)(I)
11. Public Comment
12. Adjourn.

DONALA WATER AND SANITATION DISTRICT
BOARD OF DIRECTORS
MEETING MINUTES
SEPTEMBER 23, 2021

The Board of Directors of the Donala Water and Sanitation District met in regular session at the District's office, 15850 Holbein Dr., El Paso County, Colorado on September 23, 2021 at 1:30pm.

Directors Present: Ed Houle
Wayne Vanderschuere
Kevin Deardorff
Bill George
Ed Miller

Staff Present: Jeff Hodge
Christina Hawker
Tanja Smith

Consultants Present: Brett Gracely (LRE)
Joel Barber (LRE)
Roger Sams (GMS)
Haley Orahood (CDPHE) (Online)
Kristy Richardson (CDPHE) (Online)
Margaret Talbott (CDPHE) (Online)
MaryAnn Nason (CDPHE) (Online)
Steven Brown (Radiation Pros)

Guests: Jackie Burhans (OCN)
James Howald (OCN)
Bonnie Lavin
Pete Smith (Online)
Eric (Online)

President Houle called the meeting to order at 1:30pm.

Approval of Agenda:

- Approved.

Public Comment Non-Agenda Items:

- None.

Review of Minutes:

- Minutes from August 2021 Board Meeting accepted
 - George motioned to approve, Deardorff second, all aye.

Review of Financial Statements and Check Summaries:

- Donala revenue at 21.58% and expenses at 44.21%.
- Waste Plant revenue at 46.61% and expenses at 43.79%.

- General Fund return is 0.09%.
 - George motion to accept, Vanderschuere second, all aye.

Public Remarks on Radium Levels:

- Houle opened the public remarks session stating that each of the Board members do live in the District and drink the same water that all of the constituents do. Their number one goal is to provide the entire District the best water possible. He then turned the floor over to Hodge who provided an overview on the situation:
 - Donala was notified of a violation of EPA standards to the radium levels tested at our Holbein plant.
 - Gleneagle is located on top of a mesa and we live on rock. We pump our water from deep wells that penetrate the rock to extract the water that is millions of years old.
 - The water is tested at the plant, right after the filtration system. The water is then pumped to the Holbein tanks and it is blended with other well water as well as surface water. The water delivered to customer's homes will likely test at a lower level due to the blending. We have tested several homes and are awaiting those results as well as the most current test results from the plant.
 - We have obtained a water model from GMS which helps better understand how the water moves throughout the District and will allow us to manage the variety of water we have.
 - The water we receive from CSU is actually OUR water from our ranch water right in Leadville. CSU serves as a mechanism to treat, convey and deliver that water to us. There are no radionuclides in that water.
 - Bonnie Lavin inquired to the timeframe for mitigation. Our notice stated 2 years. Hodge verified that along with verifying that the State has provided a timeframe of 5 years for mitigation.
 - Bonnie Lavin asked if the radium could be absorbed through the skin.
 - Steven Brown from Radiation Pros, who is an expert, Board Certified Health Physicist who specializes in the health aspects of radiation who is currently the safety officer approved by the Colorado Department of Health and Environment made the following comments:
 - Based on EPA drinking water limits for radionuclides, we can assume that consuming water regularly with 5 pCi/liter radium is equal to an additional approximately 4 millirems of annual exposure.
 - Because we live in Colorado our exposure is much higher than other parts of the country due to higher elevation resulting in less atmosphere above us and more naturally occurring radium in the rocks and soil we live on.
 - Living here on the front range every person is exposed to an annual background exposure of approximately 400-500 millirems versus living in Florida where their average annual exposure is about 100-150 millirem.
 - We live in a radioactive environment, there is radioactive material in the food we eat, the water we drink, the air we breathe, the cosmic rays and the gamma rays we are exposed to daily. Our levels of exposure are higher than in other parts of the country because we are choosing to live along the front range.
 - Mr. Brown is not all that concerned with the levels we have, although he did indicate that we do need to get those levels below EPA's criteria of 5 pCi/liter total radium. At our current levels we are incurring approximately 1% of the already existing difference in risk from the annual radiation background exposure by living along the front range versus Florida. Regarding its naturally occurring radioactive material content, he believes that the water is currently safe to drink.
 - Haley Orahod of CDPHE confirmed that the excess cancer risk is one in ten thousand. If ten thousand people consumed water at the level of 5pCi/L for a lifetime, one person may contract cancer.
 - Kristy Richardson, also of CDPHE and is the State Toxicologist agreed with Haley's statement and elaborated that if we had 10 pCi/L that risk would be doubled. 10 thousand people drinking water at that level for a lifetime then 2 to 3 people may contract cancer.

- The current cancer risk in Colorado is 1 in 3.
 - The level of radiation at our water level is equal to one chest x-ray a year.
 - A larger threat may be radon, as the radium in the rocks do break down to radon gas. She recommends that those concerned have their homes tested for radon.
 - Showering and bathing may result in a higher risk of radon which can be mitigated by turning on the exhaust fan or opening a window.
 - Mr. Brown elaborated that the radon in water is not directly associated with the amount of radium in the water. Most of the radon has been dissolved in the water directly from the geologic formation it came from.
- Bonnie Lavin asked how it happened in the first place. Is the growth contributing to the problem? Hodge responded that Special Districts in Colorado have no planning authority, therefore Donala has no control over growth.
 - Bonnie also asked if we have enough water. Hodge assured her that we do have plenty of water. We are always searching for renewable water rights to purchase to add to our water portfolio.
 - Bonnie also brought up recharging the aquifer. Yes, this may be an option. We currently have our water engineers, LRE working on a project to do just that.
 - Bonnie asked if we are encouraging xeriscaping and if Donala will provide incentives for that. Hodge responded that this is something we will be evaluating in the near future.
 - Roger Sams stated that GMS has met in depth with staff to make changes to our process.

LRE Well Study:

- Testing of water quality was performed August 25th. The initial Total Radium results indicate that the District should engage in additional engineering review to identify treatment options and costs to address the Radium. We have one quote to undertake this work for \$60,500.
- Joel Barber announced that we did get a grant to develop the framework to partner with Triview for Aquifer Storage Recovery (ASR). Each party will pay \$25,000 and the State will provide \$150,000.
- We may need to re-drill a couple of wells.
- Hodge noted that we will be leasing 120 AF of water for \$60,000. Board directed Hodge to sign the agreement when it's available.

Pikes Peak Regional Water Authority (CSU Loop):

- The participants will hold an update meeting September 24th.

County Loop:

- The group has submitted a letter requesting funding from the El Paso County Commissioners in the amount of roughly \$40 million. The County received American Rescue Plan (ARP) monies and part of the project could be funded these monies.

Northern Water Delivery Line:

- Triview met with CSU to discuss the proposed System Availability Fees.

North Monument Creek Interceptor (NMCI):

- Nothing new to report.

Hodge wanted to add the for the majority of the staff and himself, our time this month has been taken up meeting with engineers, talking with and returning emails regarding the notice that was sent out to our customers informing them that the radium levels have been above the limit imposed by the State. Houle and the rest of the Board offered many thanks to Victoria, Christina and Tanja for fielding the many calls the District has received.

Status of Operations:

- Water Report:
 - District consumed 39.552 million gallons in August.
 - 28.038 from our wells and 11.513 from Willow Creek Ranch delivered by CSU.
 - Wastewater Treatment Plant received 12.273 million gallons of water as influent, the remaining amount, 27.279 MG, or 68% was used for outside watering.

- Water Meter Upgrade and Replacement:
 - The completion date for this project is October 2021. As of today, 1,400 meters/transmitters have been installed.

- Wastewater Report:
 - UMCRRWTF continues to produce a good quality effluent that exceeds all State discharge permit standards
 - Biosolids were found to be above the TENORM exempt level of 5 pCi/gm – a pCi is one trillionth of a curie. We believe the level is within an acceptable range for land application. We will be tested annually for TENORMs.
 - Our average biosolids test results for Radium 226 was 8.6 pCi/g-dry and for Radium 228 was 9.9 pCi/g-dry.
 - BOD5 resulted in 99% removal.
 - Total Suspended Solids results = 98% removal.
 - Completed work project by staff consisted of:
 - UVAS/UVT probe has been removed and sent to HACH for its annual rebuild and bench test.
 - Cleaned Disinfection Equalization Basin (DEB).
 - Cracked scum through drain in SBR 2 was repaired.
 - Tested #2 SBR tank drain for proper operation in preparation to put this unit on-line to drain #3 SBR for equipment rotation.
 - Aaron and Amy have started cross training program.
 - Plant H2) wet-well was cleaned and returned to service.
 - Staff disassembled, cleaned and rehabbed the 30ft mag hydroxide chemical tank delivery fill line.
 - Roger Sams stated that rule making hearing are coming up which may impact the plant.

Additional Comments:

- None.

Meeting adjourned 3:20 p.m.

These minutes are respectfully submitted for record by Tanja Smith on September 23, 2021.

DONALA WATER & SANITATION DISTRICT
Statement of Revenues and Expenditures - 2021 DONALA SUMMARY
From 1/1/2021 Through 10/3/2021

25%

	Total Budget - Revised	Current Year Actual	Percent Total Budget Remaining - Revised
OPERATING REVENUE			
WATER SALES	3,426,000.00	2,619,402.04	(23.54)%
EFFLUENT SALES	154,500.00	113,713.32	(26.40)%
SEWAGE SERVICE	1,241,411.00	974,057.16	(21.54)%
INSTALLATION FEES	15,000.00	18,000.00	20.00%
TAP FEES	170,000.00	180,600.00	6.24%
WATER DEVELOPMENT	65,000.00	78,000.00	20.00%
SEWER DEVELOPMENT	25,000.00	30,000.00	20.00%
PROPERTY TAX	1,971,120.00	1,961,484.70	(0.49)%
AUTO TAX	120,000.00	171,975.86	43.31%
AVAIL. OF SERVICE	8,750.00	9,625.00	10.00%
OPERATING INTEREST	85,000.00	3,911.40	(95.40)%
INVESTMENT INTEREST	45,000.00	28,728.17	(36.16)%
WATER INVESTMENT FEE	40,000.00	48,000.00	20.00%
MISC. REVENUE	50,000.00	59,149.78	18.30%
FL REIM. REVENUE	120,000.00	130,100.24	8.42%
CONTRACT SANITATION	0.00	67,741.51	0.00%
Total OPERATING REVENUE	7,536,781.00	6,494,489.18	(13.83)%
EXPENSES & CAP PROJECTS			
EXPENDITURES			
CHEM/LAB	75,500.00	71,214.35	5.68%
REPAIR/MAINTENANCE	466,400.00	195,317.00	58.12%
TRUCK/BACKHOE	220,000.00	55,593.97	74.73%
UTILITIES	320,000.00	327,833.71	(2.45)%
TOOLS AND EQUIPMENT	25,000.00	2,043.71	91.83%
INSPECTION REFUNDS	2,000.00	0.00	100.00%
WASTE PLANT EXPENSES	767,858.00	401,406.97	47.72%
W & P LOAN PAYBACK	356,687.00	313,677.28	12.06%
AUDIT	23,175.00	23,200.00	(0.11)%
RESIDUALS MGMT.	85,000.00	12,572.13	85.21%
INSURANCE	313,114.00	232,492.62	25.75%
LEGAL EXPENSES	50,000.00	16,254.50	67.49%
OFFICE EXPENSES	24,643.00	18,474.81	25.03%
OFFICE EQUIPMENT	10,700.00	0.00	100.00%
TELEPHONE	27,807.00	23,945.04	13.89%
PROFESSIONAL ENGR.	25,000.00	68,852.33	(175.41)%
DISTRICT ENGINEER	10,000.00	35,911.66	(259.12)%

DONALA WATER & SANITATION DISTRICT
Statement of Revenues and Expenditures - 2021 DONALA SUMMARY
From 1/1/2021 Through 10/3/2021

	Total Budget - Revised	Current Year Actual	Percent Total Budget Remaining - Revised
SALARIES	723,081.00	538,695.48	25.50%
PAYROLL TAXES	54,231.00	41,196.48	24.04%
457 PLAN	50,616.00	31,683.22	37.40%
CONTRACT SERVICES	78,445.00	91,776.25	(16.99)%
PUBLICATION	16,000.00	11,998.22	25.01%
FEES, PERMITS, DUES	20,000.00	17,652.05	11.74%
TRAINING	25,000.00	11,371.55	54.51%
INVESTMENT EXPENSES	5,800.00	3,440.60	40.68%
COUNTY TREAS. FEE	30,000.00	29,422.27	1.93%
2020 BOND	320,586.00	320,586.04	(0.00)%
FL REIM. EXPENSE	10,000.00	21,439.96	(114.40)%
MON W & S REIM EXP	0.00	932.79	0.00%
CSU WTR/BOWW	2,111,958.00	933,937.05	55.78%
MISCELLANEOUS EXP	14,000.00	3,872.40	72.34%
Total EXPENDITURES	6,262,601.00	3,856,794.44	38.42%
CAPITAL PROJECTS			
CAPITAL PROJECTS	3,585,000.00	561,955.60	84.32%
WATER RIGHTS	60,000.00	0.00	100.00%
Total CAPITAL PROJECTS	3,645,000.00	561,955.60	84.58%
Total EXPENSES & CAP PROJECTS	9,907,601.00	4,418,750.04	55.40%

DONALA GOVT. - SEPT. 2021				
DATE	VENDOR	CK#	AMOUNT	DESCRIPTION
09/01/21	AXIS	1285	\$138.79	BASE & USAGE CHARGE KYOCERA COPIER
09/01/21	CYBERBASEMENT	1286	\$60.00	OCTOBER WEBSITE MAINTENANCE
09/01/21	JOHN DEERE FIN	1287	\$302.87	TAPE, CLOTHING ALLOWANCE, CAM LOCKS
09/01/21	PIPESTONE EQUIPMENT	1288	\$1,256.85	UPGRADE TO CSU TIE-IN
09/01/21	LINCOLN FINANCIAL	ACH	\$3,243.09	457 PLAN AUGUST 31ST 2021
09/02/21	MTOT BANKCARD	ACH	\$2,552.94	MTOT BANKCARD AUGUST
09/03/21	CHRISTIAN BROTHERS	1289	\$336.88	OIL & FILTER CHANGE/ REPLACE FUEL FILTERS
09/03/21	COLO SPRGS UTILITIES	1290	\$117.03	GAS THRU 08/26/21
09/03/21	DIRT ROAD DIESEL	1291	\$222.70	MAINTENANCE ON F-350
09/03/21	SERVICE UNIFORM	1292	\$496.40	UNIFORM MAINTENANCE THRU 08/24/21
09/03/21	UTILITY NOTIFICATION CENTER	1293	\$157.08	AUGUST 811 CALLS
09/03/21	USIC LOCATING SERVICES	1294	\$1,443.00	AUGUST LOCATE SERVICES
09/03/21	CHASE BANK	ACH	\$291.50	AUGUST BANK SERVICE CHARGE
09/07/21	ANSWER-RITE	1295	\$107.20	SEPTEMBER ANSWERING SERVICE
09/07/21	COMCAST	1296	\$114.30	INTERNET@ RHULL THRU 10/03/21
09/07/21	CORE & MAIN	1297	\$457.56	BEVELING TOOL FOR PIPE REPAIRS
09/07/21	DPC INDUSTRIES	1298	\$5,127.72	CAUSTIC SODA, CHLORINE, POTASSIUM PERMANGANATE
09/07/21	WEX BANK	1299	\$266.92	AUGUST FUEL EXPENSES
09/07/21	CEBT	ACH	\$22,526.58	SEPTEMBER HEALTH INSURANCE PREMIUMS
09/07/21	PILOT	ACH	\$111.00	SEPTEMBER FUEL EXPENSES
09/13/21	COLO SPRGS UTILITIES	ACH	\$128,946.04	WATER DELIVERED SEPTEMBER 2021
09/14/21	CHASE CC	ACH	\$2,380.61	OFFICE SUPPLIES, SDA CONFERENCE, TOOLS
09/14/21	PILOT	ACH	\$185.72	SEPTEMBER FUEL EXPENSES
09/15/21	HEARTLAND PAYROLL	ACH	\$44,873.77	SEPTEMBER 15TH 2021 PAYROLL
09/16/21	LINCOLN FINANCIAL	ACH	\$3,178.77	457 PLAN SEPTEMBER 15TH 2021
09/17/21	AIRGAS USA	1300	\$271.24	NITROGEN, ACETYLENE, & OXYGEN CYLINDER RENTALS
09/17/21	BLACK HILLS ENERGY	1301	\$109.86	GAS THRU 09/09/21
09/17/21	COMCAST	1302	\$370.15	INTERNET@ MAINTENANCE & HOLBEIN
09/17/21	COMCAST BUSINESS	1303	\$675.04	FIBER LINE SEPTEMBER
09/17/21	FP MAILING SOLUTIONS	1304	\$81.00	LEASE ON POSTAGE MACHINE
09/17/21	GRAINGER	1305	\$91.05	BLOWER FOR FOX RUN LIFT STATION
09/17/21	HAYES POZNANOVIC KORVER	1306	\$85.00	LEGAL AUGUST 2021
09/17/21	HAZEN RESEARCH	1307	\$2,928.00	RADIUM TESTING FOR WELLS
09/17/21	PIPESTONE EQUIPMENT	1308	\$2,511.94	UPGRADE TO VALVES@ CSU TIE IN
09/17/21	SPRINT	1309	\$517.17	PHONE BILL (719) 488-3603
09/17/21	THE GAZETTE	1310	\$106.28	NOTICE OF FINAL PAYMENT NOTICE
09/17/21	TIMBERLINE	1311	\$1,720.55	CSU TIE IN
09/17/21	VERIZON WIRELESS	1312	\$159.35	WILLOW CREEK DATA PLAN
09/17/21	WELLS FARGO FINANCIAL	1313	\$157.00	LEASE ON KYOCERA COPIER
09/17/21	WINN-MARION BARBER	1314	\$5,543.83	#2 CLEAR WELL VFD
09/20/21	INTERSECTIONS INC	1315	\$160.00	IDENTITY PROTECTION
09/20/21	CORE & MAIN	1316	\$1,262.49	INVERTED RING COVERS/ AVK STOCK PARTS
09/20/21	DPC INDUSTRIES	1317	\$50.00	CHLORINE
09/20/21	MARK GARRETT	1318	\$35.83	TITLE CHECK REFUND
09/20/21	HACH COMPANY	1319	\$218.80	PAN INDICATOR SOLUTION
09/20/21	LAURA HAUGE	1320	\$91.50	TITLE CHECK REFUND
09/20/21	HPE INC	1321	\$136.00	SEPTEMBER PREVENTIVE MAINTENANCE
09/20/21	HEATHER JONES	1322	\$61.67	TITLE CHECK REFUND
09/20/21	SCOTT KRISKOWSKI	1323	\$208.24	TITLE CHECK REFUND
09/20/21	PAUL MASON	1324	\$1,249.14	LEAK ADJUSTMENT
09/20/21	SHANA MORRIS	1325	\$41.96	TITLE CHECK REFUND
09/20/21	OLSON LANDSCAPING	1326	\$3,790.00	HUNTINGTON BEACH ISLAND RESTORATION
09/20/21	RADIATION PROS LLC	1327	\$4,392.83	RADIOACTIVE MATERIALS LICENSE
09/20/21	THOMAS SKELTON	1328	\$113.22	TITLE CHECK REFUND
09/20/21	DONALD SMART	1329	\$21.61	TITLE CHECK REFUND
09/20/21	SPRINT	1330	\$365.35	EMPLOYEE CELL PHONES - WP

09/20/21	JAMES WALKER	1331	\$44.69	TITLE CHECK REFUND
09/21/21	JEFFREY HODGE	1332	\$782.88	MILEAGE REIMBURSEMENT - TRAINING & MEETINGS
09/21/21	LRE WATER	1333	\$7,665.80	PROFESSIONAL SERVICE THRU 08/25/21
09/21/21	STANDARD INS	1334	\$849.58	DISABILITY - OCTOBER 2021
09/21/21	PILOT	ACH	\$166.67	SEPTEMBER FUEL EXPENSES
09/23/21	BADGER METER	1335	\$1,020.00	COUPLING 1" BRASS
09/23/21	KEYSTONE UTILITY	1336	\$16,324.80	CELLULAR WATER METER INSTALLATION
09/23/21	CHRISTEN SMITH	1337	\$40.14	TITLE CHECK REFUND
09/24/21	EDWARD MILLER	1338	\$662.00	REIMBURSEMENT - COLORADO WATER CONGRESS
09/24/21	PINNACOL ASSURANCE	1339	\$2,204.00	WORKMENS COMPENSATION
09/24/21	COLORADO CLEANING	1340	\$321.50	JANITORIAL SERVICES OCTOBER
09/27/21	ABILIA	1341	\$133.17	MIP CLOUD SUBSCRIPTION
09/27/21	RICHARD MARKOW	1342	\$356.21	TITLE CHECK REFUND
09/28/21	ACZ LAB	1343	\$126.24	EXPENSED TO WASTE PLANT
09/28/21	COMCAST BUSINESS	1344	\$484.66	PHONE BILL (719) 488-3603
09/28/21	FRONTIER IT	1345	\$4,294.00	MONTHLY BILLING FOR SEPT AND OCT
09/28/21	GRAINGER	1346	\$273.15	2 BLOWERS DONALA, 1 FOREST LAKES
09/28/21	KEYSTONE UTILITY	1347	\$11,343.00	CELLULAR WATER METER INSTALLATION
09/28/21	TIMBERLINE	1348	\$2,278.00	WELL TROUBLESHOOTING
09/28/21	PILOT	ACH	\$273.83	SEPTEMBER FUEL EXPENSES
09/30/21	AXIS	1349	\$274.84	BASE & USAGE CHARGE KYOCERA COPIER
09/30/21	FLOWPOINT ENVIRONMENTAL	1350	\$1,095.00	WATER+7 THRU 12/31/22
09/30/21	LAWRENCE HOWELL	1351	\$92.58	TITLE CHECK REFUND
09/30/21	TIMBERLINE	1352	\$1,170.25	DONALA/ FL TANK UBIQUITI
09/30/21	VTI SECURITY	1353	\$340.00	SOFTWARE SUPPORT RENEWAL
09/30/21	JAMES WATERS	1354	\$39.64	TITLE CHECK REFUND
09/30/21	DARIN WILLIAMS	1355	\$1,247.22	TITLE CHECK REFUND
09/30/21	WINN-MARION BARBER	1356	\$5,425.00	VFD
09/30/21	HEARTLAND PAYROLL	ACH	\$46,962.40	SEPTEMBER 30TH 2021 PAYROLL
09/30/21	MOUNTAIN VIEW ELECTRIC	ACH	\$50,608.00	SEPTEMBER ELECTRIC

AUGUST SPENDABLE

CAPITAL RESERVE	\$2,334,674
CHECKING	631,918
STRATEGIC PLANNING	1,002,171
OPERATING RESERVE	733,788
DEBT SERVICE FUND	1,250,000
PROPERTY TAX	<u>4,876,291</u>
TOTAL	\$10,282,842

SEPTEMBER SPENDABLE

CAPITAL RESERVE	\$2,334,708
CHECKING	858,132
STRATEGIC PLANNING	1,002,186
OPERATING RESERVE	733,798
DEBT SERVICE FUND	1,250,000
PROPERTY TAX	<u>4,907,358</u>
TOTAL	\$11,086,182

DONALA WATER & SANITATION DISTRICT
Statement of Revenues and Expenditures - 2021 WASTE PLANT EXEC SUMMARY
From 1/1/2021 Through 9/30/2021

	Total Budget - Revised	Current Year Actual	Percent Total Budget Remaining - Revised
OPERATING REVENUE			
PD-DONALA	767,858.00	401,406.97	(47.72)%
FOREST LAKES O & M PAYMENTS	90,704.00	64,124.40	(29.30)%
TRIVIEW O & M PAYMENTS	705,303.00	468,428.03	(33.58)%
Total OPERATING REVENUE	<u>1,563,865.00</u>	<u>933,959.40</u>	<u>(40.28)%</u>
EXPENSES & PROJECTS			
EXPENDITURES			
CHEMICAL AND LAB	145,200.00	79,030.31	45.57%
REPAIR/MAINTENANCE	183,600.00	41,549.87	77.37%
TRUCK/MOWER EXP.	2,000.00	658.14	67.09%
UTILITIES	338,900.00	233,475.21	31.11%
CONTRACT SERVICES	31,700.00	24,681.78	22.14%
BIOSOLIDS HAULING	105,240.00	66,649.39	36.67%
TOOLS AND EQUIP.	5,000.00	591.58	88.17%
INSURANCE	111,000.00	99,803.00	10.09%
OFFICE EXPENSE	3,400.00	1,017.39	70.08%
TELEPHONE	6,600.00	6,751.78	(2.30)%
DISTRICT ENGINEER	26,525.00	7,655.70	71.14%
SALARIES	407,300.00	304,513.45	25.24%
PAYROLL TAXES	30,550.00	23,295.36	23.75%
457 PLAN	27,250.00	17,659.37	35.19%
TRAINING	10,000.00	5,859.95	41.40%
FEES, PERMITS	19,000.00	813.75	95.72%
PUBLICATION	600.00	0.00	100.00%
MISCELLANEOUS	2,000.00	386.33	80.68%
LEGAL EXPENSE	3,000.00	0.00	100.00%
AFCURE	50,000.00	26,118.50	47.76%
Total EXPENDITURES	<u>1,508,865.00</u>	<u>940,510.86</u>	<u>37.67%</u>
Total EXPENSES & PROJECTS	<u>1,508,865.00</u>	<u>940,510.86</u>	<u>37.67%</u>

WASTE PLANT - SEPT. 2021				
DATE	VENDOR	CK#	AMOUNT	DESCRIPTION
09/01/21	ACZ LABORATORIES	1136	\$1,020.11	NONYLPHEN & MONTHLY COMPLIANCE/ BASELINE
09/01/21	FRONTIER IT	1137	\$1,025.00	MONTHLY BILLING FOR SEPTEMBER
09/01/21	RAMPART PLUMBING	1138	\$444.37	REPAIRS TO SBR #2 & MG(OH)2 PIPE
09/01/21	LINCOLN FINANCIAL	ACH	\$1,698.13	457 PLAN AUG 31ST 2021
09/03/21	DENALI WATER	1139	\$1,661.43	SLUDGE HAULS WEEK ENDING 08/27/21
09/03/21	RAMPART PLUMBING	1140	\$22.78	PVC CEMENT AND PRIMER
09/03/21	SERVICE UNIFORM	1141	\$426.40	UNIFORM MAINTENANCE THRU 08/24/21
09/07/21	ENERGY LABORATORIES	1142	\$846.00	TENORM COMPLIANCE
09/07/21	FOREST LAKES	1143	\$123.77	AUGUST POTABLE WATER
09/07/21	POSTAL ANNEX	1144	\$91.68	WATER TEST SHIPMENTS
09/14/21	CHASE CC	ACH	\$5,241.02	DISPOSAL OF HAZARDOUS WASTE, INK
09/17/21	CO ANALYTICAL	1145	\$30.00	TOTAL RECOVERABLE METALS
09/17/21	DENALI WATER	1146	\$763.00	SLUDGE HAULS WEEK ENDING 09/03/21
09/17/21	INDIGO WATER GROUP	1147	\$384.00	ONLINE TRAINING FOR WASTEWATER TREATMENT
09/17/21	LAW FIRM OF CONNIE KING	1148	\$725.00	PROFESSIONAL SERVICES AUGUST
09/17/21	RAMPART PLUMBING	1149	\$696.06	PIPE REPAIR CLAMP/ BALL VALVES
09/17/21	TIMBERLINE	1150	\$1,558.56	AUTO SAMPLER FLOW SIGNAL/ FLUME CALIBRATIONS
09/17/21	USA BLUE BOOK	1151	\$397.93	10 BOXES LATEX GLOVES
09/17/21	WASTE MANAGEMENT	1152	\$2,778.94	AUGUST SCREENINGS HAUL
09/19/21	LINCOLN FINANCIAL	ACH	\$1,698.13	457 PLAN SEPT 15TH 2021
09/20/21	INTERSECTIONS INC	1153	\$54.00	IDENTITY PROTECTION
09/20/21	CENTURY LINK	1154	\$213.98	INTERNET@ WASTE PLANT
09/21/21	GRAINGER	1155	\$646.46	SEWAGE EJECTOR PUMP/ EXTENSION CORD
09/21/21	STANDARD INS	1156	\$458.89	DISABILITY - OCTOBER 2021
09/23/21	DENALI WATER	1157	\$1,735.83	SLUDGE HAULS WEEK ENDING 09/17/21
09/24/21	COLORADO CLEANING	1158	\$223.50	JANITORIAL SERVICES OCTOBER
09/27/21	ALFA LAVAL ASHBROOK	1159	\$955.94	LOWER BELT
09/27/21	RAMPART PLUMBING	1160	\$38.58	COUPLER & VALVES
09/28/21	FRONTIER IT	1161	\$1,025.00	MONTHLY BILLING FOR OCTOBER
09/28/21	PIKES PEAK CULLIGAN	1162	\$81.00	DRINKING WATER RENTAL
09/30/21	DENALI WATER	1163	\$766.82	SLUDGE HAULS WEEK ENDING 09/24/21
09/30/21	MOUNTAIN VIEW ELECTRIC	ACH	\$22,946.00	SEPTEMBER ELECTRIC

CHANDLER INFORMATION:

SEPTEMBER 2021

GENERAL FUND: \$2,634,301 (invested) Market Value
\$ 821,742 (Colorado State Bank)
Next Maturity Date: 01/11/2022
\$150,000
BV RETURN: 0.12%

Staff Report

From: Jeff Hodge, General Manager

Subject: LRE Well Field Study

Recommendation: Review and discuss.



Memorandum

To: Jeff Hodge, Donala Water and Sanitation District
From: Helen Malenda-Lawrence, LRE Water
Copy to: Project Files
Reviewed by: Joel Barber, LRE Water
Date: October 1, 2021
Project: Donala Well Field Review
Subject: Donala Denver Basin Well Field Review – Maintenance and Operations Recommendations

Summary

In order to assess the current (2021) conditions of Donala Water and Sanitation District's (DWSD) Denver Basin wells, LRE Water (LRE) reviewed well construction details, analyzed available pumping and water-level records, conducted interviews with well managers, and sampled for a suite of chemical and microbiological indicators of corrosion and fouling issues. LRE combined these lines of evidence to provide recommendations for well maintenance and operations.

Maintenance and Operations Recommendations

- **Recommendation 1:** Drill two new Denver Basin wells. Replace well 7D and drill a new Arapahoe well to have sufficient resiliency in the system in case of worsening existing well performance or total failure.
 - The DWSD groundwater supply comes primarily from eight operating Denver Basin wells. Well inventory data indicate DWSD has operated up to 13 Denver aquifer and Arapahoe aquifer wells in the past. It is LRE's understanding there is little resiliency in DWSD's system to absorb additional well failures.
 - It is difficult to predict which of the eight operating wells will fail next and how soon another well will fail. The wells that have already failed include wells of different ages, aquifers, and construction designs. Additionally, many of the currently operational wells have multiple warning signs in the evaluated datasets.
 - Corrosion issues seem more critical than bacteriological ones. The native groundwater has a chemistry aggressive towards steel, multiple wells

have intermittent screens and casing of different materials which are vulnerable to corrosion, and multiple wells have tested positive for water quality indicators of potential steel corrosion. All of the existing wells are at risk to being significantly impacted by corrosion, similar to the failed well 7D. Because of this, the DWSD groundwater supply system needs additional wells to prevent against impacts to supply when there is another temporary or permanent well failure.

- To build towards additional water supply resiliency, the new Arapahoe well should be designed and located so that it could be potentially utilized as part of a future ASR pilot project.
- **Recommendation 2:** Video-log the two operational wells that have the strongest corrosion indicators as well as potential bacteriological issues, wells 4A and 12A, as soon as possible.
 - Video-logs will provide visual evidence of well material integrity and potential screen fouling (clogging) issues and will inform what rehabilitation (rehab) measures are needed and possible. For example, because of potential corrosion issues, aggressive rehab measures are not advised, and well rehab is not recommended until well integrity can be confirmed through video-logging.
 - Additionally, video-logging well 3D, which was recently taken out of operation due to production issues, would verify well integrity and help diagnose potential mechanisms behind the reduced production capabilities.
- **Recommendation 3:** Avoid cycling wells on and off and set wells at more consistent flow rates by installing and using variable frequency drive (VFD) pumps.
 - Well cycling can contribute to corrosion issues and potential bacteriological fouling.
 - Relative flow rates from contributing wells can be planned using individual wells' production capabilities and water quality. For example, reducing the flow rates of wells with higher radium concentrations will reduce the overall water treatment needed to remove radium. However, this approach will require routine testing of radium levels in wells and regular attention and adjustment as needed.

- **Recommendation 4:** DWSD staff should begin monitoring wells for indications of performance issues as part of regular well field maintenance.
 - Whenever possible, but at least monthly, measure specific capacity at each well, which is the pumping rate (yield) divided by the drawdown and represents a well's efficiency. Reduced specific capacity can indicate either bacteriological fouling or mineral clogging of the well screen.
 - As part of quarterly water quality monitoring, water samples at each well should be collected and analyzed for total iron, aqueous iron (Fe^{2+}), manganese (Mn), dissolved oxygen (DO), chloride (Cl^-), sulfate (SO_4^{2-}), bicarbonate (HCO_3^-), and radium (Ra-226 and Ra-228). High concentrations of aqueous iron indicates the potential for active steel corrosion, while the other analytes could provide information related to the mechanisms behind steel corrosion and radium mobilization. Routine sampling for radium will allow for the tracking of radium concentrations over time, may help identify mechanisms contributing to high radium concentrations, and will help inform well contributions for water blending.
 - Track production of sand or other particulates, either by taking photos or having a space to describe particulates in well operations field sheets. Observed sediment in the water or supply system may indicate screen or casing compromise. Document changes in water color or smell on well operations field sheets. Tracking water quality issues, the presence of sediment, and well operation procedures allows for early detection of system changes and may help identify mechanisms related to reduced water quality or well efficiency.
 - Contact LRE Water or another groundwater professional if there are sudden and/or noticeable changes in the water's color or smell, the amount of sediment being produced by a well, or the concentration of aqueous iron is greater than 1 mg/L.

Overview of Well Inventory and Evaluation

In order to assess the current (2021) conditions of Donala Water and Sanitation District's (DWSD) Denver Basin wells, LRE Water (LRE) reviewed well construction details, analyzed available pumping and water-level records, conducted interviews with well managers, and sampled for a suite of chemical and microbiological indicators of corrosion and fouling issues. This section describes the well inventory and data evaluation processes in more detail.

- **Well Construction Inventory**
 - LRE downloaded well construction information documents from the Colorado Division of Water Resources (DWR) well permit database for well permits associated with DWSD. LRE reviewed the permits and associated well construction records and summarized the relevant information in Appendix 1.
 - Information potentially related to well integrity included the age of the well, screen and casing schedule and materials, and the initial well yield, tested for at the time of construction. There were no apparent patterns in the wells that have already failed; failed wells were of different ages, aquifers, yields, and construction designs. Many currently operational wells were built the same year or before failed wells and have similar construction design qualities.

- **Analyses of Water-level and Pumping Data**
 - DWSD provided LRE with pumping and water-level records from approximately 2000 through 2020. LRE analyzed these records, which included monthly observations of the wells' pumping statuses (currently pumping or not pumping); production (pumping) rates, and water levels, measured either through an airline system or by a pressure transducer. Table 1 summarizes the findings of the water-level and pumping analyses.

 - LRE plotted well production rates through time and where appropriate, fitted linear trend lines in order to estimate changes in production rates through time. For each well, LRE recorded the first and last years of observations, their associated production rate estimates, and the percent change between the first and last production rate estimates (Table 1). Negative percent changes indicate declining production rates and may indicate issues with well efficiency. However, changes to well production

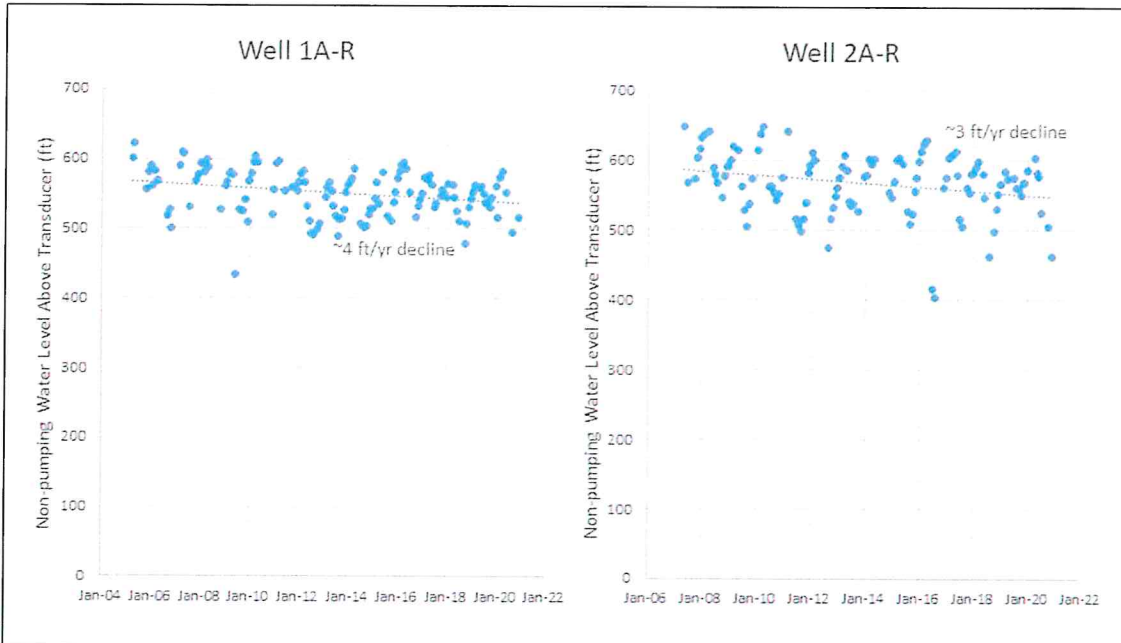
rates could have been needed to meet water quality goals or reflect other operations considerations and should be used cautiously as an indicator of well efficiency.


Table 1: Summary of Analyses and Review of Water-level and Pumping Data.

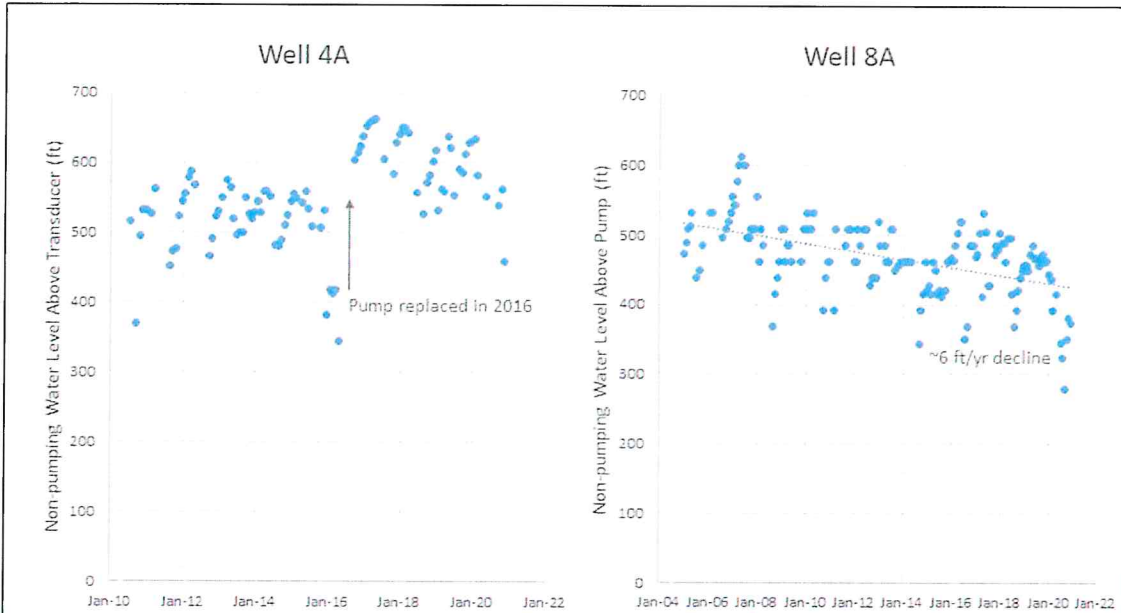
Well Name	Start date	Start GPM	End Date	End GPM	Change in GPM	WL Notes	Specific Capacity Notes
1A-R	2005	530	2020	460	-13%	~4 ft/yr decline	no significant change
2A-R	2007	370	2020	270	-27%	~3 ft/yr decline	slight increase
3D	2001	185	2020	140	-24%		significant decrease
4A	2004	550	2020	650	18%		significant increase
8A	2005	350	2020	450	29%	~7ft/yr decline	slight increase
9A	2005	570	2019	520	-9%	~4 ft/yr decline	slight increase
11D	2004	325	2020	250	-23%		no significant change
12A	2006	350	2020	370	6%	~5ft/yr decline	significant increase
14A	2008	400	2020	200	-50%	~1 ft/yr decline	significant increase

Notes: Bold values indicate changes that are of potential concern.

- LRE divided the water-level data into pumping and non-pumping water-level observations and plotted the non-pumping observations through time. Figures 1a through 1d (pages 6-9) display the hydrographs of non-pumping water-level data through time for currently operational wells. Multiple wells display declines in these water levels through time. The well with the most significant declines in non-pumping water levels was well 8A. 8A exhibited non-pumping water-level declines of approximately 6 ft/year; however, these measurements may reflect water levels still recovering from pumping and may represent declines local to the well and not necessarily regional declines. If water-level declines do reflect regional trends in the groundwater systems, or if declines increase in magnitude or continue long term, well efficiency and production may be adversely affected.



<p>DATE: 9/29/2021 AUTHOR: HFM CHECKED BY: JB</p>	<p>Figure 1a Non-pumping water-level data, plotted through time, from wells 1A-R and 2A-R</p>	 <p>CONNECTING WATER TO LIFE 1221 Auraria Parkway, Denver, CO 80204</p>
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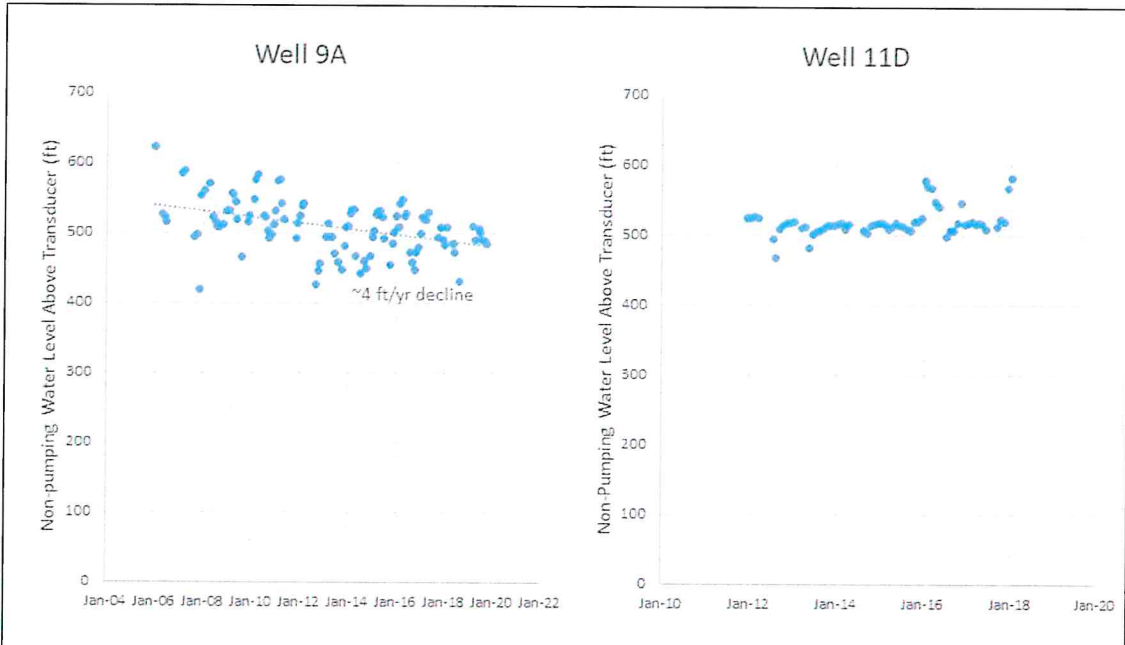
DATE: 9/29/2021

AUTHOR: HFM

CHECKED BY: JB

Figure 1b
Non-pumping water-level data, plotted
through time, from wells 4A and 8A





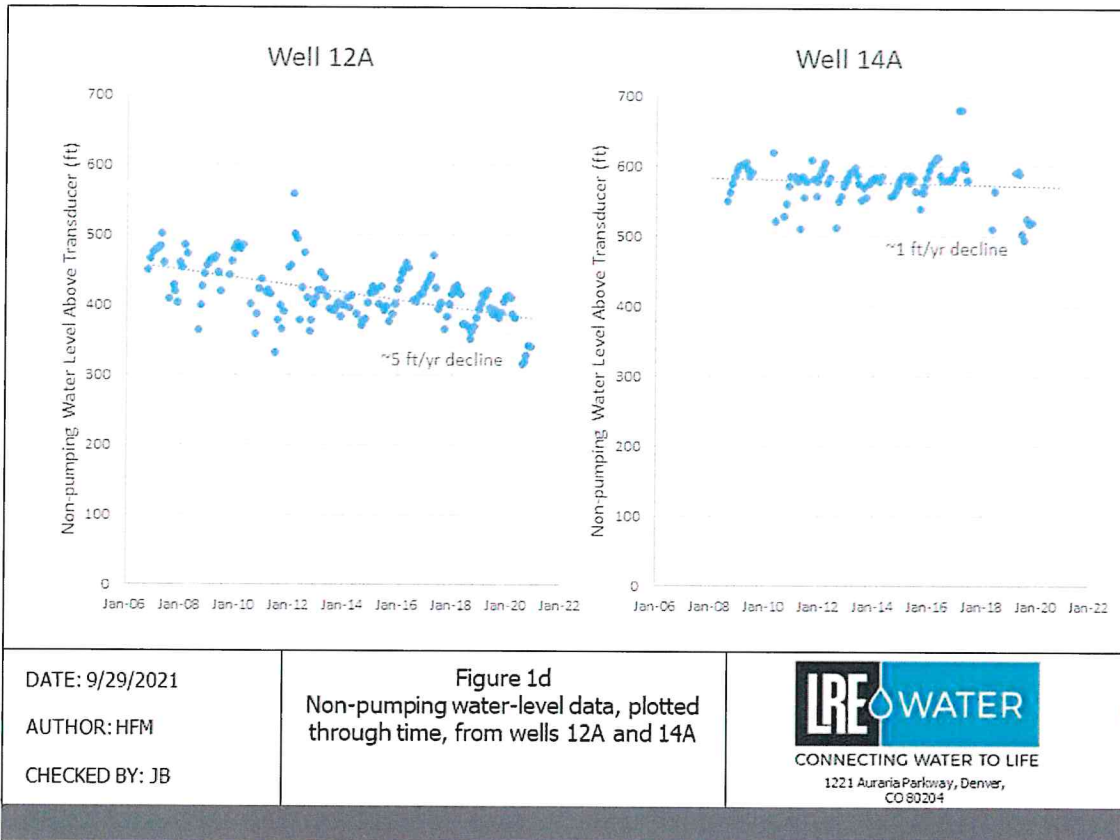
DATE: 9/29/2021

AUTHOR: HFM

CHECKED BY: JB

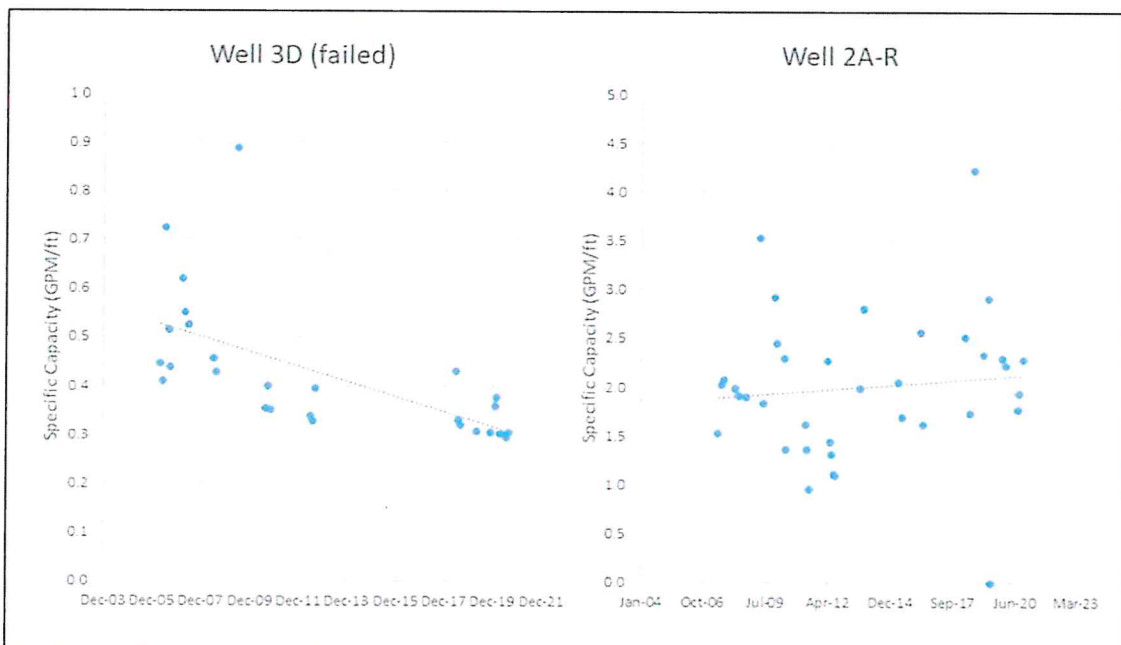
Figure 1c
Non-pumping water-level data, plotted
through time, from wells 9A and 11D






- LRE used the pumping rates and water-level data to estimate specific capacity through time. Specific capacity reflects well efficiency and is the pumping rate (yield) divided by the observed drawdown. Reduced specific capacity can indicate either bacteriological fouling or mineral clogging of the well screen or a reduction in aquifer productivity due to water level declines. To estimate a well's relative specific capacity through time, LRE divided the recorded pumping rates (in GPM) by the difference between the associated pumping water level and the nearest non-pumping water level observation (in ft). This difference between the pumping water level and the most recent non-pumping water level is the best available estimate of drawdown. LRE removed outliers from the results, which likely reflected the limitations of the analysis method. For each well, specific

capacity estimates were plotted through time and described qualitatively as having “no significant change”, “slight” decreases or increases, or having “significant” increases or decreases. The only well with an observed decrease in specific capacity was the most recent well to “fail”, 3D. Well 3D had a significant decrease in its specific capacity estimates, had a 24% decrease in production rate, and recently became inoperable due to production issues. Figure 2 shows the specific capacity through time for 3D and 2A-R, an example of a well with a slight increase in specific capacity estimates. A video-log of 3D would provide visual evidence of well casing integrity and would help rule out corrosion or fouling as reasons for well efficiency losses.



<p>DATE: 9/29/2021 AUTHOR: HFM CHECKED BY: JB</p>	<p>Figure 2 Specific Capacity estimates, plotted through time, from wells 3D and 2A-R</p>	 CONNECTING WATER TO LIFE 1221 Auraria Parkway, Denver, CO 80204
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- **Well Manager Interviews**

- On August 11, 2021 LRE personnel met with DWSD well managers to collect information about well operations and observations. LRE asked questions related to the current statuses of wells (operational or not operational, and if not operational, why); observed water quality issues, either in formal water quality analyses or changes to water color or odor; observed sediment in the supply system; and operational considerations, such as average pumping duration or the degree of pump cycling. Table 2 (page 12) summarizes the well manager responses.

- **Water quality sampling**

- Because of recent water quality standard exceedances, LRE sampled operational DWSD wells on August 24, 2021, for turbidity, arsenic, uranium, and radiologicals (gross alpha, gross beta, radium-226, radium-228, and radon). Appendix 2 summarizes the turbidity, arsenic, uranium, and radiological results.
- LRE also reviewed historic radium data, provided by DWSD. In general, these data are from when the wells were constructed and sampling events from the late 2000's (from approximately 2008-2013). These data were combined with the 2021 water quality sampling results to evaluate trends in the radium concentrations (Appendix 3). In general, there is not a statistically significant trend in radium concentrations.
- During the August 2021 sampling event, LRE also collected water to create diagnostic well profiles at operational wells. These profiles include results of different water quality parameters indicative of potential steel corrosion and/or bacteriological fouling. The water samples were submitted, along with additional observations and well construction information, to Water System Engineering, Inc. (WSE), who analyzed the water samples and assisted in identifying which wells were most likely to have corrosion or fouling issues. Table 3 (page 13) summarizes the results for select diagnostic parameters, while Appendix 4 presents the report from WSE.

Table 2: Summary of Management and Operations Observations

Well Name	Service Status	Observed Water Quality Issues	Observed Sediment	Cycling	Additional Notes
1A-R					Operating 16 hour per day (R. Hull WTP)
2A-R			In meter	on/off	Pump replaced in 2014; Acid washed ~2017
2D-R	<i>Out of service, Electrical</i>		<i>In meter</i>		<i>Pump replaced in 2018</i>
3A	<i>Out of service, Holes in casing</i>		<i>In meter during summer</i>		
3D	<i>Offline</i>		<i>In meter</i>	<i>on/off</i>	<i>Most drawdown</i>
4A		Potential Fe smell		15-45 min cycles	Back up for Holbein WTP; Pump replaced in 2016 and 2020(?); underloads
7D	<i>Out of service, Busted pipe, no pump</i>				
8A		Potential Fe smell	In valve		Primary well for Holbein WTP, underloads
9A					Operating 16 hour per day
11D		Potential Fe smell; Faint sulfur smell			
12A		Potential Fe smell; Faint sulfur smell; Cloudiness	In valve		Secondary well for Holbein WTP; underloads
13D	<i>Out of service, Only sampling</i>				
14A		Strong sulfur smell			Low flow due to Rads
DA-10	<i>Out of service</i>				
6DW	<i>Out of service</i>				<i>Not in use, but not abandoned</i>
5DW	<i>Abandoned</i>				<i>Abandoned</i>

Notes: Well operations information details were compiled from the 8/11/21 meeting with well managers. Grey and italicized font indicates a well that is not currently operational.

Table 3: Summary of August, 2021 Water Quality Results

Well Name	LSI	[Fe ²⁺] (mg/L)	Crystalline Debris	Bacterial Activity	Fe/Mn-oxidizing Bacteria	Resuspended Iron (mg/L)	[Mn] (mg/L)	Gallionella
1A-R	-1.76	ND	very low	very low	Negative	0.31	ND	NA
2A-R	-1.53	0.15	very low	low	Positive	0.29	ND	low
4A	-1.36	1.72	very low	moderate	Positive	2.10	0.5	low
8A	-1.16	0.88	very low	heavy	Negative	1.63	0.3	low
9A	-1.58	0.41	low	heavy	Positive	0.53	0.2	moderate
11D	-0.68	0.94	moderate	moderate	Positive	2.38	0.3	low
12A	-1.06	1.43	very high	moderate	Positive	2.26	0.2	very low
14A	-0.89	0.53	very low	heavy	Positive	2.14	0.2	very low

1. **Notes: Bolded font indicates a parameter of concern.**
2. Negative LSI values generally reflect more corrosive water chemistry.
3. Based on publicly available water quality data, the average aqueous iron concentrations in wells screened in the Denver and Arapahoe aquifers in the southwest part of the Denver Basin are 0.2 and 0.4 mg/L, respectively.
4. Resuspended iron concentrations above 1.0 mg/L indicate a potential for iron fouling.
5. [Mn] above 0.1 mg/L indication the potential for manganese deposition.

- The results of the water quality parameters diagnostic of potential corrosion or fouling indicate that the native groundwater has a chemistry aggressive towards steel. A negative Langelier Saturation Index (LSI) implies that the sampled water is inclined towards corrosion, rather than chemical deposition or scaling. Aqueous iron (Fe²⁺) concentrations represent the amount of iron dissolved in the water and suggest active corrosion. Lastly, the presence of crystalline debris, such as quartz or feldspars, in the water samples could indicate a screen or casing compromise.
- In addition to screen fouling, bacteria can also facilitate or exacerbate metal corrosion. Parameters indicative of potential bacteriological issues include the degree of bacterial activity; the presence of iron- or manganese-oxidizing bacteria; high concentrations of resuspended iron and manganese; and the occurrence of Gallionella, which is linked to both metal corrosion and screen fouling (McLaughlin, 2014).
- Additionally, chloride, sulfate, and bicarbonate concentrations may help diagnose steel corrosion (Larson and Skold, 1957), and these analytes, along with dissolved oxygen, total manganese, and total iron, have been

correlated with radium mobilization mechanisms (Szabo et al., 2012). Routine water quality sampling for these analytes and radium may help identify mechanisms contributing to high radium concentrations, and routine radium measurements will help inform well contributions for water blending.

- The two operational wells that have the strongest corrosion and potential bacteriological issues are wells 4A and 12A. Although conditions at wells 4A and 12A are the most concerning, wells 8A and 11D are also of concern. Both of these wells have relatively high concentrations of aqueous iron, as well as observed sediment in water samples or water system. The video-logs of 4A and 12A will provide a measure of the potential severity of corrosion and/or fouling issues in the DWSD well field and will inform how quickly mitigation measures will need to be taken.

Conclusions

LRE crafted the well maintenance and operations recommendations based on the presented datasets and analyses. There is evidence for potential metal corrosion and/or bacteriological fouling at multiple wells. Bacteriological issues may be related to and exacerbate metal corrosion, and well operation practices may affect corrosion and bacteriological concerns. Video-logging wells will help confirm well integrity and inform rehabilitation measures. Changes to well operations procedures could help prevent future water quality and production issues, and formal tracking measures would document the effectiveness of operations changes and allow for early identification of corrosion or water quality problems.

Limitations

The recommendations and conclusions of this study were made based on publicly available data, data provided by DWSD, and water quality data for which LRE collected water samples, but contracted the analyses. The conclusions are subject to revision, particularly if new data are discovered, data are re-analyzed, or additional information is made available.

References

McLaughlin, R. G., (2014) Corrosion of Water Wells. In Nazeer Ahmed et al., (Ed.). *Hydraulics of Wells : Design, Construction, Testing, and Maintenance of Water Well Systems*. American Society of Civil Engineers, ProQuest Ebook Central.

Larson, T.E. and Skold, R.V. (1957) Corrosion and tuberculation of cast iron. *J. Am. Water Works Assoc.*, 49(10) 1294-1302.

Szabo, Z., Vincent, T., Fischer, J. M., Kraemer, T. F., & Jacobsen, E. (2012) Occurrence and geochemistry of radium in water from principal drinking-water aquifer systems of the United States. *Applied Geochemistry*, 27(3), 729-752.



Appendix 1: Well Construction Information

Well Name	Permit No.	Aquifer	Year Constructed	Well Depth (ft)	Pump Depth (ft)	Permitted Yield (GPM)	Tested Yield (GPM)	Current Yield (GPM)	Casing Type (from construction report)	Screen Type (from construction report)	Screen Intervals (depth, ft)
1A-R	16140-F-R	ARAPAHOE	2004	1169	1108	600	600	460	CS (ASTM A53B)	#034 wire wrapped	747-1149; 15 screens
2A-R	49356-F-R	ARAPAHOE	2006	1305	1238	500	600	270	CS (ASTM A53B)	304 SS Screen	918-1295; 9 screens
2D-R	27228-F-R	DENVER	2006	900	853	250	250	[125]	Steel	SS	667-890; 4 screens
3A	49355-F	ARAPAHOE	1985	1440	1355	500	327		Steel	316-SS 0.03 slot	894-1430; 10 screens
3D	34670-F	DENVER	1989	860	742	200	206	140	322 solid wall steel	50 slot screen	310-850; 10 screens
4A	55359-F	ARAPAHOE	2001	1754	1662	500	600	650	CS (ASTM A53B)	Stainless Steel	1,300-1,724; 12 screens (with anodes)
7D	36286-F	DENVER	1991	1250	772	300	150		Steel	screen	525-1214; 9 screens
8A	62679-F	ARAPAHOE	2004	2325	1977	800	600/690	450	Steel	Stainless Steel	1,946-2,310; 11 screens
9A	62584-F	ARAPAHOE	2005	1060	1012	750	650	530	CS (ASTM A53B)	304 SS	684-1040; 8 screens
11D	49715-F	DENVER	1998	1310	992	350	350	250	CS (ASTM A53B)	304 SS	605-1290; 13 screens
12A	47623-F	ARAPAHOE	2006	2086	1436	500	450	370	CS (API5LX42)	SS (304 SS Johnson)	1634-2071; 16 screens
13D	52386-F	DENVER	1999	1070	736	500	350	[75-160]	CS (ASTM A53B)	304 SS	389-1050; 17 screens
14A	65096-F	ARAPAHOE	2007	2030	1950	800	550	200	CS (ASTM A53B)	Stainless Steel	1580-2020; 14 screens (with zinc anodes)
DA-10	37982-F	LOWER DAWSON	1999	440	--	225	20	NA	Steel	Steel	130-430; 5 screens
6DW	37503-F	LOWER DAWSON	1991	110	--	225	60	NA	Steel	Screen	60-80 and 90-110
5DW	31263-F	LOWER DAWSON	1987	222	183	--	--	NA	Steel	Screen	40-202; 5 screens

Notes: Permits listed here are from the most recent replacement well and appear to be actively connected to well construction details and are not cancelled permits or related to permitted use changes.

Grey and italicized font indicates a well that is not currently operational.

The presented current yield values are from the 8/11/21 meeting with well managers

Casing and screen types reflect language in the well construction reports



Appendix 2: Summary of Water Quality Data- Sampled in August 2021

Well Name	Turbidity (NTU)	Arsenic (mg/L)	Uranium (mg/L)	Gross Alpha (pCi/L)	Gross Alpha*** (pCi/L)	Gross Beta (pCi/L)	Radium-226 (pCi/L)	Radium-228 (pCi/L)	Ra-226/228 (combined) (pCi/L)	Radon (pCi/L)	Total Solids (mg/L)
MCL*	NA	0.01	0.03	15	15	NA	combined	combined	5	300	NA
1A-R	0.24	0.0042	0.0002	1.30	1.30	<4.2	1.1	4.4	5.50	643	88
2A-R	1.07	0.0118	0.0005	20	19	11.00	8.8	4.4	13.20	5000	114
4A	2.18	0.0021	<0.0002	12	12	13.00	5.8	7.8	13.60	2270	156
8A	3.73	0.0013	<0.0002	3.20	3.20	8.00	1.5	6.7	8.20	268	138
9A	0.64	0.0052	<0.0002	1.50	1.50	<3.9	1.4	6.8	8.20	570	112
11D	5.84	<0.0006	<0.0002	^ 4.80	4.80	^ 7.3	2.3	7.9	10.20	322	288
12A	3.73	0.0020	<0.0002	16	16	7.90	4.3	8.9	13.20	1870	158
14A	18.20	0.0007	<0.0002	29	29	17.00	13.0	7.7	20.70	9070	162

*MCL- Maximum contaminant limit- Reflects primary drinking water standards



Appendix 3: Historic Radium Concentration Data

Holbein	year drilled		R-Hull	year drilled
	2001	2004		
4A	2001	2004	1A-R	2004
8A	2004	2006	2A-R	2006
11D	1998	2005	9A	2005
12A	1996			
14A	2007			

R Hull EP 001	Ra-226	Ra-228	Total
6/28/2018	1.80	2.20	4.00
8/31/2018	1.50	2.50	4.00
8/21/2020	2.00	3.20	5.20
10/23/2020	1.20	1.90	3.10
Holbein EP 002	Ra-226	Ra-228	Total
8/11/2020	2.80	2.80	5.60
10/23/2020	3.60	2.80	6.40
3/25/2021	3.20	4.00	7.20
6/24/2021	2.60	4.90	7.50
Holbein Back Wash	Ra-226	Rad228	Total
10/23/2020	4.20	3.50	7.70
RMB Return	Rad226	Rad228	Total
10/23/2020	4.00	13.00	17.00

Holbein WTP				
Well 4A	Ra-226	Ra-228	Total	
12/31/2001	NT	NT	NT	NT
6/18/2009	6.40	3.20	9.60	
5/15/2013	2.90	3.80	6.70	
8/24/2021	5.80	7.80	13.60	
8A	Ra-226	Ra-228	Total	
6/5/2004*	NT	NT	NT	
10/1/2008	2.10	3.90	6.00	
5/17/2013	1.80	3.50	5.30	
8/24/2021	1.50	6.70	8.20	
11-D**	Ra-226	Ra-228	Total	
12/31/1999	2.70	4.20	6.90	
6/18/2009	1.70	3.70	5.40	
8/21/2013	1.90	5.60	7.50	
8/24/2021	2.30	7.90	10.20	
12A	Ra-226	Ra-228	Total	
1/17/1997	NT	NT	NT	
10/1/2008	4.40	4.40	8.80	
5/15/2013	3.30	3.10	6.40	
8/24/2021	4.30	8.90	13.20	
14A	Ra-226	Ra-228	Total	
2/7/2007***	14.00	3.60	17.60	
12/6/2007	9.60	2.40	12.00	
8/21/2013	11.00	3.40	14.40	
8/24/2021	13.00	7.70	20.70	

R Hull WTP				
Well 1A	Ra-226	Ra-228	Total	
8/25/1988	1.10	NT	1.10	
Well 1A-R	Ra-226	Ra-228	Total	
10/1/2008	1.60	2.70	4.30	
10/23/2020	1.00	4.10	5.10	
8/24/2021	1.10	4.40	5.50	
2A-R	Ra-226	Ra-228	Total	
5/16/2007	7.80	3.80	11.60	
7/12/2007	13.00	2.70	15.70	
8/24/2021	8.80	4.40	13.20	
9A	Ra-226	Ra-228	Total	
7/14/2005	2.00	2.30	4.30	
6/18/2009	1.10	1.90	3.00	
8/24/2021	1.40	6.80	8.20	
No Longer in Service				
2D-R	Ra-226	Ra-228	Total	
1/8/2007	2.40	4.90	7.30	
10/7/2007	2.60	4.20	6.80	
3A	Ra-226	Ra-228	Total	
12/18/2008	2.00	1.70	3.70	
3D	Ra-226	Ra-228	Total	
12/18/2008	1.30	2.60	3.90	
7D	Ra-226	Ra-228	Total	
9/19/1994	1.80	2.90	4.70	
6/18/2009	1.10	3.20	4.30	
5/15/2013	2.40	3.60	6.00	
13D	Ra-226	Ra-228	Total	
10/3/2000	1.60	4.30	5.90	
8/16/2012	2.40	4.40	6.80	

Effects of Blending and Filtration									
2A-R	Ra-226	Ra-228	Total	Lab	Filtrated				
5/16/2007	7.80	3.80	11.60	Hazen	N (?)				
7/11/2007	NT	NT	NT	Hazen	N (?)				
7/11/2007	13.00	2.70	15.70	ACZ	N (?)				
2A-R/9A Blend	Ra-226	Ra-228	Total	Lab	Filtrated				
7/11/2007	NT	NT	NT	Hazen	N				
7/11/2007	NT	NT	NT	Hazen	Y				
7/11/2007	6.90	2.60	9.50	ACZ	N				
7/11/2007	1.60	1.30	2.90	ACZ	Y				
2D-R	Ra-226	Ra-228	Total	Lab	Filtrated				
1/8/2007	2.40	4.90	7.30	Hazen	N				
10/17/2007	2.60	4.20	6.80	Hazen	N				
1A-R/2A-R/2D-R blend	Ra-226	Ra-228	Total	Lab	Filtrated				
10/17/2007	4.50	2.00	6.50	Hazen	N				
10/17/2007	3.40	2.30	5.70	Hazen	Y				
14A	Ra-226	Ra-228	Total	Lab	Filtrated				
1/8/2007***	2.40	4.90	7.30	Hazen	N (?)				
10/17/2007	2.60	4.20	6.80	Hazen	N (?)				
10/17/2007	4.50	2.00	6.50	Hazen	N				
10/17/2007	3.40	2.30	5.70	Hazen	Y				
6/6/2010	NT	NT	NT	Hazen	"Source" (?)				
4A/7D/8A/11D/12A/14A Blend	Ra-226	Ra-228	Total	Lab	Filtrated				
6/25/2008	5.60	3.50	9.10	Hazen	N				
6/25/2008	4.70	1.70	6.40	Hazen	Y				
8A/12A/14A/11D Blend	Ra-226	Ra-228	Total	Lab	Filtrated				
7/10/2008	10.00	3.40	13.40	Hazen	N				
7/10/2008	6.00	2.30	8.30	Hazen	Y				
8A/7D/11D/14A Blend	Ra-226	Ra-228	Total	Lab	Filtrated				
2/23/2010	NT	NT	NT	Hazen	N				
2/23/2010	NT	NT	NT	Hazen	Y				
6/8/2010	NT	NT	NT	Hazen	N				
6/8/2010	NT	NT	NT	Hazen	Y				
7D/11D/14A Blend	Ra-226	Ra-228	Total	Lab	Filtrated				
2/23/2010	11.00	2.40	13.40	Hazen	N				
2/23/2010	5.00	1.60	6.60	Hazen	Y				

Notes:
 All values are in pCi/L.
Bold font indicates radium concentrations in excess of the MCL of 5 pCi/L.
 * Sampling date is earlier than reported construction date (6/8/2008).
 ** In one spreadsheet well name was listed as 11A, but values were the same.
 *** Sampling date is earlier than reported construction date (3/9/2007).



Appendix 4: Diagnostic Well Profile Reports



Date: September 28, 2021

Lab Report No. 22235

Joel Barber
Leonard Rice Engineers
1221 Auraria Parkway
Denver, CO 80204

Project Description: Donala Water, Wells 1AR, 2A-R, 4A, 8A, 9A, 11D, 12A, and 14A
Samples dated 08/24/2021; Special Analysis (8)
PO# 968DWS40-21

Test Description:

The Complete Well Profile analysis is designed for comparative analysis of two samples, typically one static and one pumping sample. The Complete Well Profile utilizes a series of inorganic chemical and microbiological tests to identify fouling and corrosion issues with potential impacts on the operation of the sampled well. The tests include a number of inorganic chemical parameters such as pH, total dissolved solids/conductivity, hardness, alkalinity, oxidation reduction potential (ORP), bicarbonate, carbonates, silica, sodium, potassium, chloride, iron, manganese, phosphate, nitrate, sulfate, and total organic carbon (TOC). Biological assessment is designed to quantify the total bacterial population, identify two dominant populations of bacteria, assess anaerobic conditions, and identify the presence of iron related bacteria and sulfate reducing organisms. Also included are tests for Adenosine triphosphate (ATP), heterotrophic plate count (HPC), and a microscopic evaluation; and in potable systems, total coliform and E. coli coliform presence/absence.

Testing Procedures:

All laboratory testing procedures are performed according to the guidelines set forth in *Standard Methods for the Examination of Water and Wastewater* as established by the American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF). Corrosion analyses are performed in accordance with the guidelines as set forth by the National Association of Corrosion Engineers (NACE). In general, these methods are approved by both the Environmental Protection Agency (EPA) and AWWA for the reporting of water and/or wastewater data.

Sample collection and shipment is the responsibility of the customer, performed according to protocol and procedures defined by the laboratory in advance of the sampling event with regards to the specific project and nature of the problem.

Disclaimer:

The data and interpretations presented are based on an evaluation of the samples and submitted data. Conclusions reached in this report are based upon the data available at the time of submittal and the accuracy of the report depends upon the validity of information submitted. Any recommendations presented are based on laboratory and field evaluations of similar fouling occurrences within potable water systems. Further investigative efforts, such as efficiency testing, site inspection, video survey, or other evaluation methods may offer additional insight into the system's condition and the degree of fouling present.

Client: Leonard Rice Engineers

Date: September 28, 2021

Lab Report No. 22235

Re: Donala Water, Wells 1AR, 2A-R, 4A, 8A, 9A, 11D, 12A, and 14A
 Samples dated 08/24/2021; Special Analysis (8)
 PO# 968DWS40-21

ND - Not Detected NA - Not Applicable * as CaCO ₃	Donala 1AR	Donala 2A-R	Detection Limits
pH Value	6.93	6.90	NA
Phenolphthalein Alkalinity*	ND	ND	4 mg/l
Total Alkalinity*	52	64	4 mg/l
Hydroxide Alkalinity	ND	ND	4 mg/l
Carbonate Alkalinity	ND	ND	4 mg/l
Bicarbonate Alkalinity	52	64	4 mg/l
Total Dissolved Solids	85	122	1.0 mg/l
Total Suspended Solids	ND	ND	0 mg/l
Conductivity (µm or µS/cm)	119	170	NA
Langelier Saturation Index (at 16°C)	-1.76	-1.53	NA
Total Hardness*	44	68	4 mg/l
Carbonate Hardness	44	64	4 mg/l
Non Carbonate Hardness	ND	4	4 mg/l
Calcium*	44	68	4 mg/l
Magnesium*	ND	ND	4 mg/l
Dissolved Iron (as Fe ²⁺)	ND	0.15	0.02 mg/l
Suspended Iron (as Fe ³⁺)	0.03	0.11	0.02 mg/l
Iron Total (as Fe)	0.03	0.26	0.02 mg/l
Iron (resuspended)	0.31	0.29	0.02 mg/l
Manganese (as Mn)	ND	ND	0.1 mg/l
Total Organic Carbon (C)	ND	ND	0.3 mg/l
Plate Count (colonies/ml)	0	11	NA
Anaerobic Growth (%)	<10	<10	NA
Sulfate Reducing Bacteria	Negative	Negative	NA
Fe/Mn Oxidizing Bacteria	Negative	Positive	NA
Total Coliform	Negative	Negative	NA
E. Coli	Negative	Negative	NA

	Donala 4A	Donala 8A	Detection Limits
ND - Not Detected			
NA - Not Applicable			
* as CaCO ₃			
pH Value	7.04	7.20	NA
Phenolphthalein Alkalinity*	ND	ND	4 mg/l
Total Alkalinity*	64	76	4 mg/l
Hydroxide Alkalinity	ND	ND	4 mg/l
Carbonate Alkalinity	ND	ND	4 mg/l
Bicarbonate Alkalinity	64	76	4 mg/l
Total Dissolved Solids	173	145	1.0 mg/l
Total Suspended Solids	26	15	0 mg/l
Conductivity (µm or µS/cm)	240	201	NA
Langelier Saturation Index (at 16°C)	-1.36	-1.16	NA
Total Hardness*	88	76	4 mg/l
Carbonate Hardness	64	76	4 mg/l
Non Carbonate Hardness	24	ND	4 mg/l
Calcium*	76	68	4 mg/l
Magnesium*	12	8	4 mg/l
Dissolved Iron (as Fe ²⁺)	1.72	0.88	0.02 mg/l
Suspended Iron (as Fe ³⁺)	0.09	0.14	0.02 mg/l
Iron Total (as Fe)	1.81	1.02	0.02 mg/l
Iron (resuspended)	2.10	1.63	0.02 mg/l
Manganese (as Mn)	0.50	0.30	0.1 mg/l
Total Organic Carbon (C)	ND	ND	0.3 mg/l
Plate Count (colonies/ml)	12	0	NA
Anaerobic Growth (%)	<10	<10	NA
Sulfate Reducing Bacteria	Negative	Negative	NA
Fe/Mn Oxidizing Bacteria	Positive	Negative	NA
Total Coliform	Negative	Positive	NA
E. Coli	Negative	Negative	NA

ND - Not Detected NA - Not Applicable * as CaCO ₃	Donala 9A	Donala 11D	Detection Limits
pH Value	6.96	7.15	NA
Phenolphthalein Alkalinity*	ND	ND	4 mg/l
Total Alkalinity*	60	104	4 mg/l
Hydroxide Alkalinity	ND	ND	4 mg/l
Carbonate Alkalinity	ND	ND	4 mg/l
Bicarbonate Alkalinity	60	104	4 mg/l
Total Dissolved Solids	102	298	1.0 mg/l
Total Suspended Solids	1	24	0 mg/l
Conductivity (µm or µS/cm)	142	414	NA
Langelier Saturation Index (at 16°C)	-1.58	-0.68	NA
Total Hardness*	56	184	4 mg/l
Carbonate Hardness	56	104	4 mg/l
Non Carbonate Hardness	ND	80	4 mg/l
Calcium*	56	184	4 mg/l
Magnesium*	ND	ND	4 mg/l
Dissolved Iron (as Fe ²⁺)	0.41	0.94	0.02 mg/l
Suspended Iron (as Fe ³⁺)	0.10	0.07	0.02 mg/l
Iron Total (as Fe)	0.51	1.01	0.02 mg/l
Iron (resuspended)	0.53	2.38	0.02 mg/l
Manganese (as Mn)	0.20	0.30	0.1 mg/l
Total Organic Carbon (C)	ND	0.3	0.3 mg/l
Plate Count (colonies/ml)	1	0	NA
Anaerobic Growth (%)	<10	<10	NA
Sulfate Reducing Bacteria	Negative	Negative	NA
Fe/Mn Oxidizing Bacteria	Positive	Positive	NA
Total Coliform	Negative	Negative	NA
E. Coli	Negative	Negative	NA

ND - Not Detected NA - Not Applicable * as CaCO ₃	Donala 12A	Donala 14A	Detection Limits
pH Value	7.16	7.32	NA
Phenolphthalein Alkalinity*	ND	ND	4 mg/l
Total Alkalinity*	76	88	4 mg/l
Hydroxide Alkalinity	ND	ND	4 mg/l
Carbonate Alkalinity	ND	ND	4 mg/l
Bicarbonate Alkalinity	76	88	4 mg/l
Total Dissolved Solids	173	160	1.0 mg/l
Total Suspended Solids	31	22	0 mg/l
Conductivity (µm or µS/cm)	240	222	NA
Langelier Saturation Index (at 16°C)	-1.06	-0.89	NA
Total Hardness*	96	84	4 mg/l
Carbonate Hardness	76	84	4 mg/l
Non Carbonate Hardness	20	ND	4 mg/l
Calcium*	96	84	4 mg/l
Magnesium*	ND	ND	4 mg/l
Dissolved Iron (as Fe ²⁺)	1.43	0.53	0.02 mg/l
Suspended Iron (as Fe ³⁺)	0.10	0.10	0.02 mg/l
Iron Total (as Fe)	1.53	0.63	0.02 mg/l
Iron (resuspended)	2.26	2.14	0.02 mg/l
Manganese (as Mn)	0.20	0.20	0.1 mg/l
Total Organic Carbon (C)	ND	ND	0.3 mg/l
Plate Count (colonies/ml)	150	14	NA
Anaerobic Growth (%)	<10	<10	NA
Sulfate Reducing Bacteria	Negative	Negative	NA
Fe/Mn Oxidizing Bacteria	Positive	Positive	NA
Total Coliform	Negative	Negative	NA
E. Coli	Negative	Negative	NA

Microscopic Evaluation:

- 1AR: Very low visible bacterial activity, very low crystalline debris, very low biomass.
- 2A-R: Low visible bacterial activity, very low crystalline debris, very low plant particulate matter, very low iron oxide, very low iron oxide entrained biomass with low number of Gallionella.
- 4A: Moderate visible bacterial activity, very low crystalline debris, low plant particulate matter, very low iron oxide, very low iron oxide entrained biomass with low number of Gallionella.
- 8A: Heavy visible bacterial activity, very low crystalline debris, very low plant particulate matter, very low iron oxide, very low iron oxide entrained biomass with low number of Gallionella.
- 9A: Heavy visible bacterial activity, low crystalline debris, low plant particulate matter, low iron oxide, moderate iron oxide entrained biomass with moderate number of Gallionella.

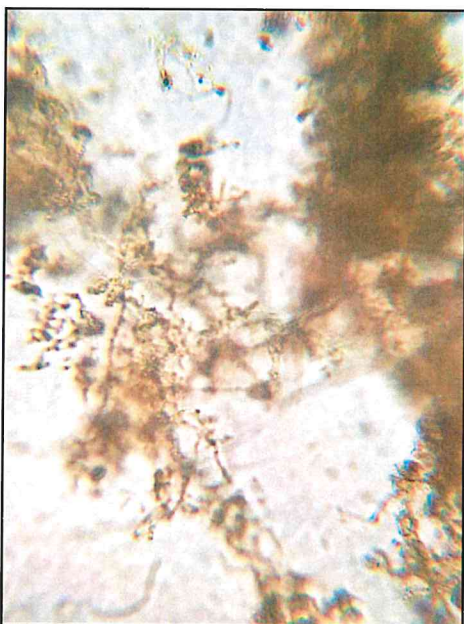


Figure 1: 9A centrifuged sediment at 200x magnification showing presence of Gallionella.

- 11D: Moderate visible bacterial activity, moderate crystalline debris, low plant particulate matter, moderate iron oxide, low iron oxide entrained biomass with low number of Gallionella.
- 12A: Moderate visible bacterial activity, low iron oxide, very low iron oxide entrained biomass with very low number of Gallionella.
- 14A: Heavy visible bacterial activity, very low iron oxide, moderate iron oxide entrained biomass with very low number of Gallionella.

Observations:

Samples were submitted from eight wells within the Donala Well Field for specified analysis to evaluate conditions occurring downhole. When received in the lab, the samples from 4A, 8A, 11D, 12A, and 14A each exhibited discoloration and varying amounts of sediment.

Recorded pH values for the samples varied between 6.9 to 7.32, falling predominantly in a range considered neutral. Total alkalinity for the samples was low, ranging from 52 to 104 ppm mg/l CaCO₃. The neutral pH and low alkalinity suggest limited buffering capability in the water which will impact corrosion indices as well as chemical cleaning and disinfection.

Hardness within the samples was limited falling below 100 mg/l with the exception of Well 11D. Hardness accounts for the concentrations of calcium and magnesium in the water chemistry and was a mix of carbonate and non-carbonate within the samples.

Total dissolved solids (TDS) and conductivity levels within the sample ranged from low to moderate with Well 11D containing the higher concentrations. Overall, the recorded TDS levels fell below the National Secondary Drinking Water Regulations of 500-mg/l for produced water.

Calculation of the Langelier Saturation Index (LSI) yielded a negative value for all eight samples. Negative LSI values indicate a water chemistry that is undersaturated with respect to calcium carbonate. Additionally, negative LSI values generally reflect more corrosive water chemistry present. At the observed levels, low carbon steel, mild steel, and damaged galvanized surfaces would be susceptible to corrosion and structural degradation.

Dissolved iron, generally reflective of active corrosion within the well, was present in seven of the eight samples. Samples from Wells 4A and 12A exhibited the highest dissolved iron levels. Resuspended iron, a total iron test that accounts for chemically and biologically mobilized iron, was present at significant levels in samples from 4A, 8A, 11D, 12A and 14A. Typically, as resuspended iron levels concentrate above 1.0 mg/l, the potential for iron fouling and degraded water quality increases. The activity of iron bacteria can influence iron testing and the mobilization of iron within the well system. As noted below, iron bacteria were identified in all of the samples except for 1AR.

Manganese, a metal that behaves very similar to iron, was present in six of the eight samples. Samples from wells 1AR and 2A-R had no manganese detected within the range of the tests. As manganese concentrations exceed 0.1 mg/L, the potential for manganese deposition and impacts on water quality increases. Manganese levels exceeded this level in all samples with manganese present.

Total organic carbon (TOC) is the amount of carbon found in an organic compound and is often used as a non-specific indicator of water quality as well as the presence of macronutrients for microbial populations. Per the US EPA guidelines, < 2.0 mg/L is desirable in treated potable water and < 4 mg/L in source water which is used for treatment. TOC was only identified in the 11D sample, falling below the target threshold of 1.0 mg/l.

Heterotrophic plate growth is a measure of biological activity among aerobic populations within a water sample. As an industry standard, it is predominantly effective in measuring surface water or terrestrial bacteria, with a reduced effectiveness for bacteria found in groundwater systems. Plate growth within the submitted samples was limited, falling in the "low range" per EPA guidelines. In several of the samples, the plate growth counts differed from observations

made of visible biological activity noted during microscopic evaluation of the samples. These included samples from Wells 8A, 9A, 11D, 12A, and 14A.

Anaerobic growth, used as a measure of the level of anaerobic activity and an assessment of more problematic bacteria, was limited to less than ten percent in the eight submitted samples. Testing for sulfate reducing bacteria (SRB's), an anaerobic bacterium associated with hydrogen sulfide (H₂S) gas production, was negative all eight samples.

Testing for the presence of iron bacteria was negative in the 1AR sample and positive in samples from Wells 2A-R, 4A, 8A, 9A, 11D, 12A, and 14A. This was confirmed during microscopic evaluation of the samples in which the iron oxidizing bacteria *Gallionella* was identified in the wells that tested positive for iron bacteria. *Gallionella* are naturally occurring, iron-oxidizing chemolithotrophic bacteria that have been identified in a variety of different aquatic habitats, including groundwater. *Gallionella* are a generally aerobic group of bacteria that utilize iron as an energy source and secrete an iron-oxy-hydroxide byproduct. This secretion is often responsible for accumulations of iron oxide in wells and piping systems. Additionally, all of the samples that tested positive for iron bacteria contained iron oxide entrained biomass.

Total coliform testing was positive for the sample from Donala 8A. The remaining seven Donala samples tested negative for total coliform occurrence. All eight Donala samples tested negative for *E.coli* specific coliforms.

As noted, iron bacteria and iron oxide entrained biomass were identified during microscopic evaluation in seven of the eight samples. Varying amounts of crystalline debris was observed in most of the samples, the exception being Wells 12 A and 14A. The sample from Well 11D contained the highest degree of crystalline debris. In general, the debris gave the characteristics of fractured, fine grained silica including quartz and feldspar.

Interpretations:

Each of the samples exhibit an aggressive water chemistry within limited natural buffering capability. Reactive metals including low carbon steel, mild steel, high-strength-low alloy steel, and galvanized steel will be susceptible to corrosion, damage, and over time, structural decay. In the short term, this aggressive water chemistry will serve to mobilize iron within the well and in the produced water. Aided by iron bacteria and by the activity of aerobic, slime forming bacteria, iron accumulation will likely continue. This will result in increased total iron levels in produced water, the development of iron rich colloidal debris, discoloration of the water and well surfaces, and an increase in pump maintenance. Additionally, as the problem increases, the use and treatability of produced water may be impacted.

It was noted in submitted paperwork that several of the wells exhibited a rotten egg or sulfur odor, commonly associated with SRB's. Human sensitivity to H₂S is strong, and the specific wells exhibiting this odor may indeed have minor populations of SRB's present. These observations should not go unnoticed and efforts to cycle the wells more frequently are advised as is the continued monitoring of downhole conditions.

Submitted data indicated that some of the wells were operating at a production rate greater than original while others were showing a decline. Specifically, Wells 1AR, 2A-R, 11D are showing an impact of 10% or greater. Based on the submitted data and analysis presented in this report, 2A-R, 11D should be evaluated further to include a current measure of specific capacity and

video-survey to better evaluate the level of impact and need for more invasive maintenance efforts.

Despite submitted production values showing an increase, samples from Wells 4A, 8A, 12A and 14A show signs of an increase in fouling potential. Further investigative efforts to include a evaluation of produced water quality and treatment, and a video survey are advised for these wells to identify any significant concerns presenting themselves beyond the limitations of this current testing. If production remains strong, a pH adjusted enhanced disinfection effort may be sufficient to reduce the presence of fouling mechanisms.

If you have any questions or require additional information, please contact our office.

Michael Schnieders, PG, PH-GW
Hydrogeologist

Staff Report**From: Jeff Hodge****Subject: Radium Levels**

We are reviewing the latest results. The levels were still above the standard of 5. We will provide the reviewed results at the Board Meeting.

The Holbein Water Plant has been turned off and is not discharging any water into the Donala Water Distribution System. As the summertime peak water demand is behind us the plant will remain offline while we work with the State and our Engineers to resolve this issue.

EXPENDITURES	ACTUAL	BUDGET	PROJECTED	BUDGET
	YEAR END		YEAR END	
	<u>2020</u>	<u>2021</u>	<u>2021</u>	<u>2022</u>
CHEMICALS AND TESTING	\$69,137	\$75,500	\$94,952	\$125,300
REPAIR/MAINTENANCE	\$93,025	\$466,400	\$300,000	\$344,000
RESIDUALS MANAGEMNET	\$0	\$85,000	\$25,144	\$180,000
VEHICLES	\$28,490	\$220,000	\$74,996	\$78,000
UTILITIES	\$396,200	\$320,000	\$398,965	\$394,288
TOOLS AND EQUIPMENT	\$41,833	\$25,000	\$10,000	\$101,000
INSPECTION REFUNDS	\$0	\$2,000	\$0	\$2,000
WASTE PLANT EXPENSES	\$662,264	\$767,858	\$590,088	\$741,742
TV WASTE PLANT EXP.	\$608,714	\$705,303	\$570,488	\$717,106
FL WASTE PLANT EXP.	\$76,446	\$90,704	\$79,886	\$100,417
AUDIT	\$22,500	\$23,175	\$23,200	\$23,896
INSURANCE	\$277,370	\$313,114	\$270,051	\$291,337
LEGAL EXPENSES	\$60,784	\$50,000	\$24,500	\$65,000
OFFICE EXPENSES	\$14,559	\$24,643	\$27,699	\$65,400
OFFICE EQUIPMENT	\$11,203	\$10,700	\$5,000	\$5,000
TELEPHONE	\$26,715	\$27,807	\$32,773	\$33,000
ENGINEERING	\$63,642	\$35,000	\$132,205	\$150,000
SALARIES	\$760,457	\$723,081	\$721,561	\$639,445
PAYROLL TAXES	\$57,563	\$54,231	\$55,176	\$48,598
457 PLAN	\$45,826	\$50,616	\$44,978	\$44,761
CONTRACT SERVICES	\$57,537	\$78,445	\$123,610	\$177,755
PUBLICATIONS	\$14,634	\$16,000	\$13,803	\$16,000
FEES, PERMITS, DUES	\$14,402	\$20,000	\$14,712	\$15,000
TRAINING	\$9,200	\$25,000	\$20,279	\$30,000
INVESTMENT EXPENSES	\$14,004	\$5,800	\$5,906	\$5,900
COUNTY TREAS.	\$29,384	\$30,000	\$29,567	\$33,200
FOREST LAKES EXP	\$10,744	\$10,000	\$27,315	\$0
MISC. EXPENSES	\$8,466	\$14,000	\$5,000	\$10,000
CSU/PUEBLO/STORM	\$1,753,195	\$2,111,958	\$867,085	\$1,792,813
TOTAL OP & ADMIN.EXP	\$5,228,295	\$6,381,335	\$4,588,942	\$6,230,958
CAPITAL PROJECTS				
WATERLINE UPGRADE/TANKS	\$3,086,124	\$3,585,000	\$818,594	\$6,845,000
WATER RIGHTS	\$0	\$60,000	\$0	\$60,000
PRIN PYMNT LONG TERM DEBT	\$420,744	\$249,412	\$249,412	\$260,256
BOND EXPENSE	\$216,379	\$130,000	\$130,000	\$205,500
INTEREST EXPENSE	\$438,320	\$297,861	\$384,851	\$283,460
BOND ESCROW AGENT	\$10,156,081	\$0	\$0	\$0
TABOR RESERVE	\$256,487	\$249,984	\$250,107	\$263,231
DEBT RESERVE	\$0	\$1,250,000	\$1,250,000	\$1,250,000
CONTINGENCY	\$0	\$100,000	\$100,000	\$100,000
TOTAL EXPENDITURES	\$19,802,430	\$12,303,592	\$7,771,905	\$15,498,405
ENDING FUND BALANCE	\$13,603,669	\$11,989,089	\$14,168,652	\$5,265,057

2022 Budget Highlights

- **Water and Sewer Revenue** – Both the base fees for water and sewer, as well as the tiered rates represent a 3% increase in 2022.
- **Tap** – 10 tap fees are included in the budget.
- **Chemical and Testing** – A 66% increase due to the cost of increased testing and treatment of radium.
- **Repair and Maintenance** – A 36% decrease due to moving any capital purchases or replacement into the appropriate line items.
- **Residuals Management** – A 112% increase due to the radioactive materials licensing being moved from contract services and prediction of additional hauling.
- **Vehicles** – A 182% decrease due to moving any new vehicles to appropriate capital line items. This line item is for vehicle maintenance and gas expenses.
- **Tools and Equipment** – A 304% due to large equipment purchases to get plants upgraded to proper standards.
- **Office Expenses** – A 165% increase due to election expenses and Donala absorbing the credit card fees for payments.
- **Engineering** – A 330% increase due to the upkeep, repair, redrilling of our wells, as well as several studies for future water resources. District engineering and professional engineering have been combined into one line item.
- **Contract Services** – A 127% increase due to the addition of our new software. Other expenses will go down in 2023 because the new software will allow us to cancel other services that we can do in house. We are also contracting out our landscaping because our landscaper is no longer employed with Donala.
- **Capital Projects** – Costs included for 2022 are the drilling of 2 new wells, NMCI, Holbein plant upgrade, and any engineering associated with it. Also, the purchase of a new F-450 and EH Wach for district maintenance. These projects are subject to change as we receive more information and make final decisions toward the end of the year.

UPPER MONUMENT WASTE PLANT TREATMENT FACILITY SUPPLEMENT 2022				
	ACTUAL	BUDGET	PROJECTED	PROPOSED
10/15/2021	YEAR END		YEAR END	BUDGET
	2020	2021	2021	2022
OPERATING REVENUE				
PD-DONALA	\$661,202	\$767,858	\$590,088	\$741,742
PD-TRIVIEW	\$608,714	\$705,303	\$570,488	\$717,106
PD-FOREST LAKES	\$76,446	\$90,704	\$79,886	\$100,417
ACCOUNT INTEREST	\$0	\$0	\$0	\$0
MISC. REVENUE	\$1,063	\$0	\$0	\$0
ADJUST TO BALANCE	\$0	\$0	\$0	\$0
TOTAL REVENUE	\$1,347,424	\$1,563,865	\$1,240,462	\$1,559,264
TOTAL FUNDS AVAILABLE	\$1,347,424	\$1,563,865	\$1,240,462	\$1,559,264
EXPENDITURES				
OPERATING EXPENDITURES				
CHEMICAL AND LAB	\$101,899	\$145,200	\$94,715	\$120,000
REPAIR/MAINTENANCE	\$123,684	\$183,600	\$57,888	\$193,800
TRUCK/MOWER EXP.	\$3,228	\$2,000	\$965	\$2,000
UTILITIES	\$264,508	\$338,900	\$319,834	\$330,000
CONTRACT SERVICES	\$33,135	\$31,700	\$36,246	\$37,300
AFCURE	\$43,527	\$50,000	\$40,188	\$41,400
BIOSOLIDS HAULING	\$88,773	\$105,240	\$85,407	\$91,155
TOOLS AND EQUIP.	\$4,169	\$5,000	\$997	\$1,050
ADMIN & GENERAL EXPENSE				
INSURANCE	\$106,968	\$111,000	\$119,718	\$123,300
OFFICE EXPENSE	\$8,436	\$3,400	\$1,508	\$2,500
TELEPHONE	\$9,855	\$6,600	\$8,777	\$9,000
DISTRICT ENGINEER	\$14,122	\$26,525	\$10,819	\$18,500
SALARIES	\$467,991	\$407,300	\$399,838	\$447,301
PAYROLL TAXES	\$38,762	\$30,550	\$30,588	\$33,548
457 PLAN	\$23,908	\$27,250	\$23,344	\$31,311
TRAINING	\$2,612	\$10,000	\$7,632	\$10,000
FEES,PERMITS	\$9,628	\$19,000	\$1,335	\$15,000
PUBLICATIONS	\$698	\$600	\$0	\$600
O & M CAP PROJ.	\$0	\$0	\$0	\$0
MISCELLANEOUS	\$1,522	\$2,000	\$662	\$1,500
LEGAL FEES	\$0	\$3,000	\$0	\$0
ADJ TO BAL	\$0	\$0	\$0	\$0
CONTINGENCY	\$0	\$55,000	\$0	\$50,000
TOTAL OP & ADMIN. EXP	\$1,347,424	\$1,563,865	\$1,240,462	\$1,559,264
ENDING FUND & NEXT YR	(\$0)	(\$0)	\$0	\$0

Staff Report**From: Jeff Hodge, General Manager****Subject: Drilling Two New Wells**

Staff is recommending retaining LRE to provide design and general contracting oversight of drilling two new wells. We still are evaluating where the best location is to redrill these wells and if a new drill would be in order. Well 2A's pumped failed October 9th.

It the recommendation to move forward with LRE and get to the location and design so that we can go out bid. Then return to the Board for final approval before signing the final contract.

The goal is to have one to two wells online by May 2022.



Attachment A

15 October 2021

Jeff Hodge
General Manager
Donala Water and Sanitation District
15850 Holbein Dr.
Colorado Springs, 80921

RE: Letter Proposal - Engineering for 2022 Denver Basin Water Well Drilling, Construction, and Testing

Dear Mr. Hodge,

LRE understands that Donala Water and Sanitation District's (Donala) well field is aging. LRE's 2021 well field evaluation found that the existing wells are potentially experiencing excessive corrosion, and in the first two weeks of October 2021, wells 1A and 2D experienced pump problems that may be associated with corrosion or other downhole issues. LRE recommends that Donala drill and complete two new wells in early 2022, consisting of a well in the Denver aquifer and a well in the Arapahoe aquifer. This letter outlines the scope, assumptions, and schedule of costs for engineering services associated with the design, permitting, and engineering oversight of the drilling and completion of two new Denver Basin wells.

The scope of work includes the tasks described below. LRE has separated the engineering services for the Denver and Arapahoe wells to allow for Donala to drill only one of the two wells due to budgetary limitations.

Task 1: Design, Specifications, and Bid Support: LRE Water's services to Donala will begin with a review of water rights decrees and county restrictions on groundwater development. Following this review, LRE Water will develop the bid package. The bid package will include the two wells' final design specifications, drawings, and noise modeling report. Donala will publish the drilling contractor Request for Bids, and LRE Water will provide support during the pre-bid meeting, question period, bid opening, bid review, and contractor selection. Once the drilling contractor is selected and throughout the well construction process, LRE Water will review contractor preliminary submittals and invoices.

Task 2: Denver Well Construction and Testing Oversight: Once a drilling contractor is under contract with Donala, LRE Water will continue the project planning activities by coordinating the project implementation with Donala, the drilling contractor, regulators, and any other stakeholders. LRE Water will review contractor preliminary submittals and invoices. The specific tasks to be completed under Task 2 are:

Task 2A: Denver Well Permitting, Planning, Reporting, and Management:

- Apply for a well construction permit for the Denver Well from the Colorado Division of Water Resources (DWR).
- Review, comment, and approval of submittals.
- Schedule drilling and field activities with the contractors and subcontractors.
- Provide required information to DWR regarding drilling operations.
- Provide regular updates to Donala regarding drilling and well construction progress.
- Attend Donala board meetings as requested.

Task 2B: Denver Well Construction, Development, and Testing Oversight and Documentation: LRE Water will act as Donala's on-site representative and observe well drilling and well construction. Throughout drilling and construction, LRE Water will oversee well construction practices and compare practice and materials to bid specifications. In addition to these responsibilities, LRE Water will:

- Oversee geophysical logging the borehole, which will include borehole magnetic resonance (BMR), resistivity (short and long), gamma ray, and caliper measurements.
- Observe drill cutting collection, and if necessary, recommend adjustment to the total depth of drilling.
- Refine the Denver well's screen and casing design, using geophysical and geologic logs.
- Document and communicate significant deviations of well design to Donala, the drilling contractor, and DWR (if necessary).
- Observe well development.
- Coordinate and observe an 8-hour step test and a 72-hour constant-rate test.
- Near completion of the constant-rate test, collect water samples for analytical laboratory water quality analyses. Laboratory testing will include drinking water suite analytes including volatile organics, inorganics, metals, radiochemistry, and wet chemistry.
- Analyze the aquifer test data to evaluate aquifer characteristics, well performance, and potential pump options.
- LRE will work with Donala to develop a discharge plan for the water produced during development and aquifer testing.
- LRE will work with Donala and the drilling contractor in completing a El Paso county Grading and Erosion Control Plan

Task 2C: Denver Well Commissioning: LRE Water will provide support for Donala's civil engineering and construction contractors during the commissioning of the well, including installation of the permanent pump, electrical supply, controls, instrumentation, and tie into conveyance piping. This task does not include design work for pumps, electrical, controls, and tie in. In addition LRE Water will provide:

- Pump sizing and design recommendations to Donala, the well contractor, and civil engineer.
- Engineering construction observations and documentation of the pump installation.
- Support with collecting a water quality sample after installation of the permanent pump.

Task 3: Arapahoe Well Construction and Testing Oversight: Once a drilling contractor is under contract with the Donala, LRE Water will continue the project planning activities by coordinating the project implementation with Donala, the drilling contractor, regulators, and any other stakeholders. LRE Water will review contractor preliminary submittals and invoices.

Task 3A: Arapahoe Well Permitting, Planning, Reporting, and Management: LRE Water will provide the same services for the Arapahoe well outlined in Task 2A for the Denver well.

Task 3B: Arapahoe Well Construction, Development, and Testing Oversight: LRE Water will provide the same services for the Arapahoe well outlined in Task 2B for the Denver well.

Task 3C: Denver Well Commissioning: LRE Water will provide the same services for the Arapahoe well outlined in Task 2C for the Denver well.

Task 4: Well Videos: We will obtain bids from qualified contractors for videoing up to three of Donala's existing wells and provide a recommended contractor for Donala to contract to complete the well videos. After Donala contracts the well video company, LRE will support Donala in coordinating the well videos. LRE will review the well videos and provide Donala with our opinion on the well condition and recommendations for well rehabilitation.

LRE Water assumes the following for this scope of work:

- Sound mitigation is necessary at both sites and LRE Water will subcontract Behrens & Associates for environmental noise modeling.
- Wells and water quality sampling will be designed assuming no water quality issues. However, wells will be designed in such a way that spatial/depth characterization of water quality will be possible, and there will be the potential to address depth-variable water quality if needed in the future.
- Water quality samples will be collected from each well.
- Development and testing discharge water can be sent to the sanitary sewer.
- LRE Water will collect samples and contract a laboratory for water quality analyses.
- LRE Water will not be providing civil engineering services but will work with Donala's infrastructure and delivery design.

LRE will provide the following deliverables:

- Well construction bid package
- Well construction report, which will include:
 - Geologic and geophysical logs
 - As-built drawing of each well's construction
 - All well permits and variances issued by DWR
 - Results and analysis from aquifer testing
- Water quality testing results and comparison with Regulation 41?

LRE has identified the following team of geologists and engineering to execute the work under this task order.

Project Manager and Technical Lead: Joel Barber, PE
Senior Advisor: Dave Colvin, PG
Staff Hydrogeologist: Helen Malenda-Lawrence
Field Geologist: Vicky Yeap
Regulatory Support and Environmental Scientist: Diana Trejo

LRE can complete the work outlined in this task for \$ 191,594 on a Time and Materials (Not to Exceed) basis. The cost includes a 10% contingency budget. A detailed cost breakdown is provided below:

Task No.	Task Name	Hours	Labor	Expenses	Sub-Contractors	Total
01	Design, Specifications, and Bid Support	172	\$26,624	\$0	\$11,550	\$38,174
02	Denver Well					
2A	Permitting, Planning, Reporting, meetings, and Project Management	136	\$21,362	\$560	\$0	\$21,922
2B	Well Construction, Development, and Testing	158	\$22,952	\$1,680	\$2,750	\$27,382
2C	Well Commissioning	72	\$10,340	\$0	\$2,750	\$13,090
03	Arapahoe Well					
3A	Permitting, Planning, Reporting, meetings, and Project Management	136	\$21,362	\$560	\$0	\$21,922
3B	Well Construction, Development, and Testing	186	\$26,744	\$2,240	\$2,750	\$31,734
3C	Well Commissioning	72	\$10,340	\$0	\$2,750	\$13,090
04	Well Videos	45	\$6,582	\$280	\$0	\$6,862
Sub-Total						\$174,176
10% Contingency						\$17,418
Total						\$191,594

LRE Water can begin this work when given notice to proceed. We understand that Donala's goal is to have the new wells operational by May 2022. LRE can provide the engineering services to meet this goal, but delivery of the project will be based on contractor availability, procurement/contracting time, the supply chain for construction materials and pumping equipment, and civil engineering and construction scheduling.

Other Project Terms/Notes:

- Costs presented are for LRE Water labor, expenses, and subcontractors. Expenses include permit fees, equipment rentals, driving mileage and vehicle rentals, and supplies.



Mr. Jeff Hodge
15 October 2021
Page 5 of 5

- Additional costs may be required, depending on:
 - Water quality testing requirements.

Drilling complications or additional footage required.

Thank you for the opportunity to submit this proposal and please let us know if you have any questions.

Staff Report**From: Jeff Hodge, General Manager****Subject: Drilling Two New Wells**

Staff is recommending retaining LRE to provide design and general contracting oversight of drilling two new wells per the attached proposal. We still are evaluating where the best location is to redrill these wells and if a new drill would be in order.

It the recommendation to move forward with LRE and get to the location and design so that we can go out bid. Then return to the Board for final approval before signing of the final contract.

The goal is to have one to two wells online by May 2022.

Staff Report

From: Jeff Hodge, General Manager

Subject: Forest Lakes Contract

With the increased workload both in the office and in the field from an array of operational challenges, we don't have the level of staffing to both cover Donala's needs and provide the proper level of serve to Forest Lake MSD.

I recommend giving Forest Lakes 60 day notice that Donala plans to terminate the contract and enter into negotiations to exit from the contract with legal counsels assistance.

TO: Board of Directors

FROM: Jeff Hodge, General Manager

DATE: October 21, 2021

SUBJECT: Manager's Report

LRE Well Study: The initial Total Radium results indicate that the District should engage in additional engineering review to identify treatment options and costs to address the Radium. We have one quote to undertake this work for \$60,500. I have asked GMS to supply a similar Scope of Work proposal.

Pikes Peak Regional Water Authority (CSU LOOP): The participants working with the consultants have refined the possible options to two: Diversion and storage in Big Johnson or Calhan Reservoir. Now the consults will work to refine those options, piping and treatment options.

County Loop: The consult has been meeting with the group to refine the routing of the water line. It is still anticipated that the study be complete by the end of 2021.

Northern Water Delivery Line: Tri-View held a public meeting at the Fox Run Park Saturday Oct 16th. They held this to gather feedback from the community on their design routing the water line through the park.

North Monument Creek Interceptor (NMCI): Attached is a proposed updated Design Contract that was crafted by Tri-View. My recommendations are to discuss this in Executive Session and provide Staff with direction for further negotiations.

Water Report

Water Production and Delivery: The District produced 33.740 million gallons in the month of September. Of that water 20.315 million was pumped from our wells with an additional 13.425 million gallons of Willows Ranch water delivered to us by CSU. The wastewater treatment plant received 11.367 million gallons of that water as influent. The remaining amount or 66.3%, 22.373 million gallons was used for outside watering.

We continue to have operational challenges. Well 2A's pump failed the Oct 9th. Staff was able to have Hydro resource mobilize quickly and pull the pump Friday October 15th. We will video inspect the well the week of October 18th. There are about 12 pieces of the well piping that will need to be replaced due to corrosion. The pump will also need to be replaced. While on sight we are having them pull the pump in 2D and inspect the pump and video too. Well 2D is a Denver and has been offline for waiting on replacement VFD/Drive/Electronics.

Well 1A also had a electrical failure over the same time period. Hydro Resources were able to use the last of their share parts to get it back up and working. This well will need a major update of its electrical soon.

We also have all the above ground water storage tanks scheduled to be inspected in November.

Water Meter Upgrade and Replacement: The completion date for this project is October 2021. As of October 1502, water meters and/or transmitters have been installed.

October 15, 2021

Joel Barber, P.E.
Senior Project Hydrogeologist
LRE Water
Via email: joel.barber@lrewater.com

Re: Proposal for Radium Treatment Alternatives and Costs for Donala Water & Sanitation District

Dear Joel,

Corona Environmental Consulting, LLC (Corona) is pleased to submit this proposal to LRE Water to develop radium treatment alternatives and costs for the Donala Water & Sanitation District (Donala). Corona understands Donala has recently violated the combined radium-226/228 (radium) maximum contaminant level (MCL) of 5 pCi/L in its treated drinking water. Radium is present at relatively high concentrations in groundwaters used by Donala, and with the highest concentrations in the northern part of the system. Chris Corwin, Ph.D., P.E.; Craig Gorman, P.E.; and Anthony Kennedy, Ph.D., P.E. will support this effort. The following tasks describe our proposed efforts.

Task 1 – Site Visit, Data Request, and Review

Corona will perform a site visit and conduct operator interviews to better understand the current treatment processes at the Holbein and R Hull water treatment plants (WTPs). Corona will assess the space available for new water treatment processes, process compatibility, and waste streams. Corona will review current and historical operational and water quality data to establish radium removal (if any) across the existing WTP processes. Data permitting, a mass balance will be calculated to determine the current fate of radium within each WTP, because if the current processes remove radium, it creates the potential for release at concentrations higher than the raw groundwater. A mass balance will also provide insights on radium removal mechanisms and how those might be leveraged for improving the existing WTP processes. If there is insufficient radium data to confidently close a mass balance, a regular sampling plan and paired analysis that is outside the scope of the work described herein may be recommended. Corona will also consider unintended impacts of any process changes or new treatment, e.g., changing the corrosivity of the water and creating a Lead and Copper Rule issue. The Colorado Department of Public Health and Environment (CDPHE) will be consulted for any regulatory or permitting issues (particularly TENORM) as needed throughout the project.

Task 2 – Develop and Assess Treatment Alternatives

Corona will develop several treatment alternatives for removing radium from groundwater at both WTPs based on the performance of the current WTP processes and other well-established technologies. To the greatest extent possible, alternatives will include modifications and/or optimization of the current WTP processes to leverage existing infrastructure and operational staff familiarity. In addition, alternatives representing the best available, established technologies will be developed, including coagulation/filtration and ion exchange. The evaluation process includes relative evaluations of capital

cost, operation and maintenance cost, ease of operation, residuals management, and reliability, but may be tailored to criteria chosen by LRE Water and Donala. It should be noted that upon selection of the best alternative, Corona may find it prudent to recommend, or CDPHE may require, bench- or pilot-scale testing to ensure future successful implementation.

Task 3 – Class 5 Cost Estimate

Corona will prepare an AACE Class 5 (+100%/-50%) cost estimate for the selected alternative, which represents a feasibility level estimate. The cost estimate will include capital, operation, and maintenance costs based on similar projects and quotes obtained from equipment vendors. Please note, the water treatment industry is in a period of very steep pricing increases, and it is difficult to predict costs during this period of volatility.

Task 4 – Report, Recommendation, and Schedule

Corona will detail methodologies and results from Tasks 1 through 3 in a final report, including recommendations for proceeding, whether that is for further sampling and analysis, further bench- or pilot-scale testing, or implementation of the selected alternative. Corona will also develop an estimated schedule for implementing the recommendation, from design through construction. This schedule will be based on typical timelines for projects of similar size in Colorado. Please note that Corona has no control over project progress after our scope of services is complete, and the schedule is for planning and convenience only.

Schedule

We are prepared to begin the evaluation as soon as we have a contract in place.

Budget

The proposed budget for these tasks is \$53,037 inclusive of labor to be billed monthly on a time-and-materials basis, not to exceed \$53,037. The \$4,822 Reserve for Additional Services will only be used if authorized by LRE Water. This proposal shall be valid for three months from the date of this proposal.

Task	Task Description	Corwin	Kennedy	Gorman	Admin.	Subtotal Hours	Subtotal Costs
		\$275	\$185	\$275	\$105		
Donala Water & Sanitation District Radium Treatment		Principal Professional	Associate Professional	TA/QC			\$ 48,215
1	Site Visit, Data Request, and Review	12	24	4		40	\$ 8,840
2	Develop and Assess Alternatives	16	48	8		72	\$ 15,480
3	Class 5 Cost Estimates	12	40	8		60	\$ 12,900
4	Report, Recommendations, and Schedule	12	28	8	3	51	\$ 10,995
Labor Total		52	140	28	3	223	\$ 48,215
Reserve for Additional Services						10%	\$ 4,822
Proposed Total							\$ 53,037

We look forward to providing LRE Water and Donala with these services. Please contact me (mobile: 970.819.1457, Email: ccorwin@coronaenv.com) if you have any questions or wish to discuss this proposed scope further.

Very truly yours,



Chris Corwin, Ph.D., P.E.
Principal
Corona Environmental Consulting, LLC



Chad Seidel, Ph.D., P.E.
President
Corona Environmental Consulting, LLC

Owner's Report October 2021

Upper Monument Creek Regional WWTF

The Upper Monument Creek Regional Treatment facility continues to produce a good quality effluent that exceeds all state discharge permit standards. We continue to operate in budget and goals identified by the management team have been met producing our high-quality effluent. Our biosolids were found to be above the TENORM exempt level of 5 pCi/gm – a pCi is one trillionth of a curie. Based on my reading of Rule 20, I believe our results, while higher than the exempt level are within an acceptable range for land application but will require additional testing. We have scheduled an additional TENORM sampling event for this month, and we anticipate another sampling event for mid-winter.

Our average biosolids test results from Energy Laboratories were:

1. Radium 226 – 8.6 pCi/g-dry
2. Radium 228 -- 9.9 pCi/g-dry

Plant performance for BOD and suspended solids continues to be outstanding:

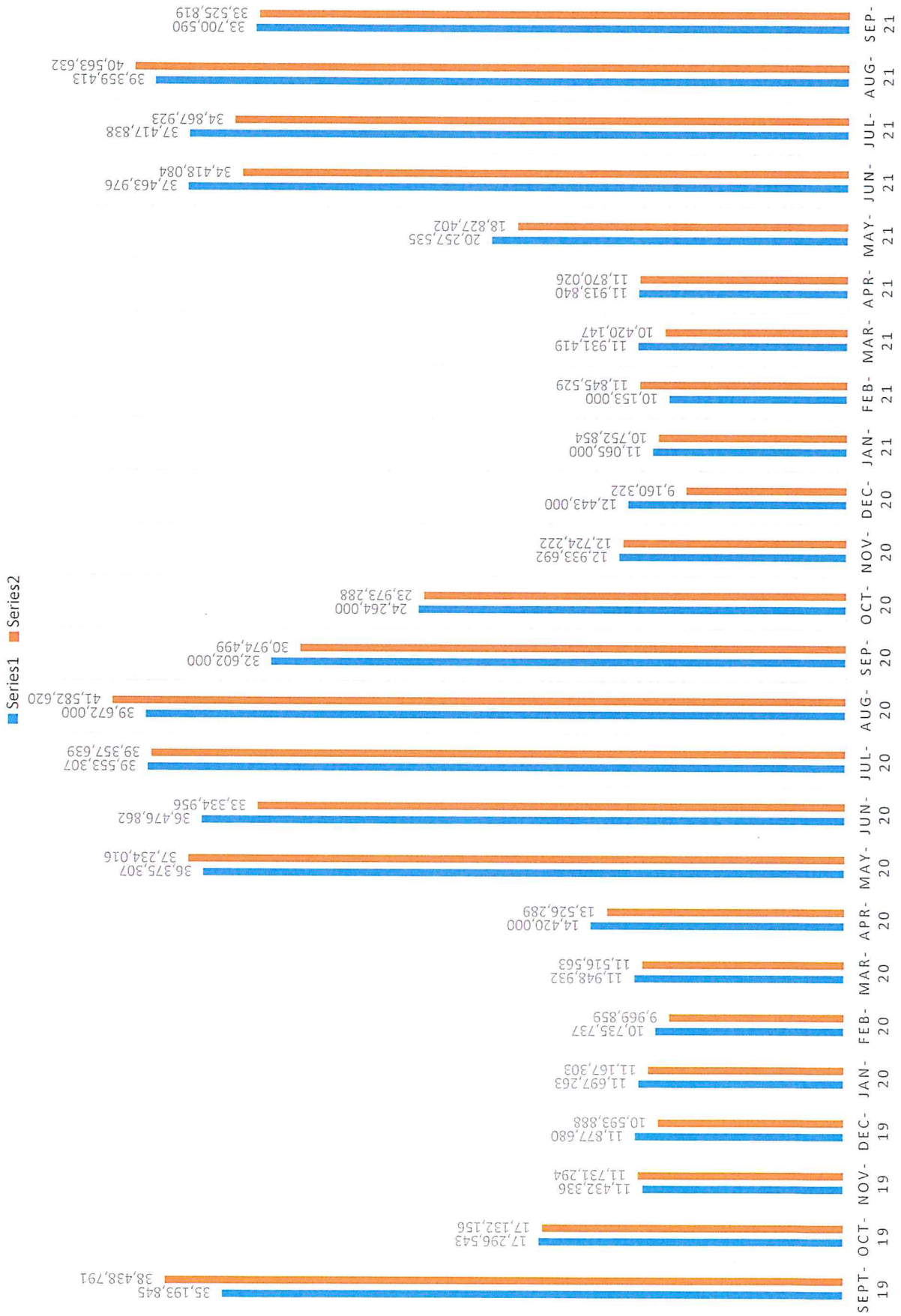
1. BOD5 results – 99% removal
2. Total Suspended Solids results – 98% removal

Completed work projects by UMCR staff:

1. UVAS/UVT probe was removed and sent to HACH for its annual rebuild and bench test.
2. Cleaned Disinfection Equalization Basin (DEB)
3. Cracked scum trough drain in SBR #2 was repaired.
4. Tested #2 SBR tank drain for proper operation in preparation to put this unit on-line to drain #3 SBR for equipment rotation. Valve appears to be draining the tank slow but at an acceptable rate. SBR switch scheduled for the first part of 2022.
5. SBR #1 decant arm air bleed off valve was repaired.
6. Replaced belt press belt.
7. Aaron and Amy have started cross training so that each will be able to step in for the other if needed.
8. Plant H2O wet-well was cleaned and returned to service.
9. Staff disassembled, cleaned and replaced part of the 30 ft mag hydroxide chemical tank delivery fill line. The old one was almost plugged.

We have had a productive and busy month accomplished with fewer staff hours as our full-time summer intern has returned to school for the Fall semester. We have several projects on the agenda for this Fall including plans to rotate SBR #2 and #3. We replaced the off-line South digester's diffusers with replacement diffusers we had on hand, and plan to rotate digesters in November. Staff continues to prepare to test for higher certifications.

2-YEAR PUMPED VS. BILLED WATER CHART



DONALA WATER & SANITATION DISTRICT BOARD STATISTICS -- MONTHLY VOLUME

SEPTEMBER 2021

1. Water Pumped	17,332,480 Gallons	
Well 9A (no read)	2983000	
Willow Creek Water	13,425,110 Gallons	
Total Water Produced	33,740,590 Gallons	
2. Backwash Robert Hull Plant	0 Gallons	
Backwash Holbein Plant	0 Gallons	
Hydrant Flush and Misc	40,000 Gallons	
Non-Revenue Water	40,000 Gallons	
3. Billable Water Produced	33,700,590 Gallons	
(Includes #1 Minus #2)		
4. Water Billed All Routes	33,434,845 Gallons	
Bulk Water Sales	90,974 Gallons	
Total Water Actually Billed This Month	33,525,819 Gallons	
Factoring in the difference in read dates using the daily average.	Gallons	
Water Billed Plus Average Use in Read Date Difference	33,525,819 Gallons	
5. %Billed vs. Distributed	99.48%	174,771 Gallons
6. Donala Waste Influent	11,367,000	45.37%
7. Triview Waste Influent	12,427,800	49.60%
8. Forest Lakes Influent	1,261,200	5.03%

Well 9A did not report reads, estimated total produced by 9A

	SF	MF	MF (SFE)	COMM	COMM (sfe)	IRR OTHER	Irr Other (SFE)	TOTAL	TOTAL (SFE)	Growth		
2019	DEC	2160	398	398	49	287	35	35	2642	2880	0.17%	
	2020	JAN	2160	398	398	49	287	35	35	2642	2880	#DIV/0!
		FEB	2162	398	398	49	287	35	35	2644	2882	0.07%
		MAR	2167	398	398	49	287	35	35	2649	2887	0.17%
		APR	2167	398	398	49	287	35	35	2649	2887	0.00%
		MAY	2170	398	398	49	287	35	35	2652	2890	0.10%
		JUN	2170	398	398	49	287	35	35	2652	2890	0.00%
		JUL	2172	398	398	49	287	35	35	2654	2892	0.07%
		AUG	2175	398	398	49	287	35	35	2657	2895	0.10%
		SEP	2175	398	398	49	287	35	35	2657	2895	0.00%
		OCT	2175	398	398	49	287	35	35	2657	2895	0.00%
		NOV	2175	398	398	49	287	35	35	2657	2895	0.00%
2021	DEC	2175	398	398	49	287	35	35	2657	2895	0.00%	
	JAN	2175	398	398	49	287	35	35	2657	2895	0.00%	
	FEB	2175	398	398	49	287	35	35	2657	2895	0.00%	
	MAR	2175	398	398	49	287	35	35	2657	2895	0.00%	
	APR	2175	398	398	49	287	35	35	2657	2895	0.00%	
	MAY	2175	398	398	49	287	35	35	2657	2895	0.00%	
	JUN	2175	398	398	49	287	35	35	2657	2895	0.00%	
	JUL	2175	398	398	49	287	35	35	2657	2895	0.00%	
AUG	2176	398	398	49	287	35	35	2658	2896	0.03%		

