DONALA WATER AND SANITATION DISTRICT
Regular BOARD MEETING AGENDA
March 17, 2022

MEETING TIME & PLACE:
1:30 P.M.
DONALA WATER & SANITATION DISTRICT
15850 HOLBEIN DRIVE, COLORADO SPRINGS, CO 80921

BOARD MEMBERS:	Ed Houle 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 February 17, 2022, Regular Meeting
6. Financial Reports
7. Action Items: None
8. Manager's Report
9. Status of Operations
    a. Water
    b. Wastewater
10. Executive Session – CRS §24-6-402(4)(a) Contract Negotiation for Long Term Water Contract with CSU.
11. Public Comment
12. Adjourn.

DONALA WATER AND SANITATION DISTRICT
BOARD OF DIRECTORS
MEETING MINUTES
FEBRUARY 17, 2022

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 January 20, 2022 at 1:30pm.

Directors Present:	Ed Houle Wayne Vanderschuere Kevin Deardorff Bill George (absent) Ed Miller
Staff Present:	Jeff Hodge Christina Hawker Tanja Smith Aaron Tolman Mike Boyett
Consultants Present:	Roger Sams (GMS) Brett Gracely (LRE) Nate Eckloff
Guests:	Jackie Burhans (OCN) James Howald (OCN)

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 January 2022 Board Meeting accepted
  - Deardorff motioned to approve, Vanderschuere second, all aye.

Review of Financial Statements and Check Summaries:

- Donala revenue at 91.7%. Expenses at 93.03%.
- Waste Plant revenue at 90.73%. Expenses at 93.80%.
- General Fund return is 0.47%.
  - Vanderschuere motion to accept, Deardorff second, all aye.

Action Items:

- Well 16A: Received bids from JDS Hydro and Layne Christensen. LRE recommends awarding project to Layne due to:
    - Drilling, construction, development and testing costs are $101,626 less than JDS Hydro.
    - Hydro proposed 50 day completion where Layne's 90 day proposal is more realistic.
    - Contact with a reference for Layne provided high praise.
    - The District has recently had better experiences with Layne's pump crews over Hydro's.
        - Vanderschuere motion to accept contract with Layne Christensen pending water decree, Deardorff second, all aye.

The Loop MOU:

- Provided Loop project memorandum of understanding to Board of Directors for approval.
    - Submitted AARPA funding request
    - Town of Monument, Woodmoor, Cherokee and Donala currently working together on this project.
        - Miller motioned to approve with minor changes, Vanderschuere second, all aye.

Manager's Report:

Radium Removal: The sample requirement at the Holbein Water Treatment Plant is currently suspended as it is offline during upgrades.

Holbein Upgrades: About 1/3 of the SCADA and electrical work has been completed. That work has been paused while the sand blasting and repainting of the filters and clarifiers is being accomplished, which is scheduled to be complete by the end of February. The plant should be back online mid-April 2022.

Well 2A: The contractor is re-installing the pump and piping. The will is anticipated to be back online by the end of February.

Well 2D: After 2A has been completed, the pump and piping will be re-installed and should be back online the first part of March.

Well 3D: Layne, is performing the work on this well and should be completed sometime in March.

Well 8A: This will be cleaned and returned to service before May 2022.

Well 12A: This well is scheduled to be cleaned and back online by May 2022.

Permitting and Drilling New Well: The District received 2 bids to perform the work on 16A. These bids and the next steps forward will be discussed at today's Board meeting.

Water Leak: There is a water break on the main waterline near the intersection of Baptist and Wildhaven/Highcrest. Due to the location and depth, we will have to contract repairs.

Pikes Peak Regional Water Authority (CSU LOOP): At the writing of this we are still waiting on the final report. I will discuss once I have received the report.

County Loop: The Loop Group continues to meet weekly to work on attaining funding and entering into a MOU.

Wastewater Report: Aaron says that the treatment process is running well.

- Aaron will be retesting for A-Wastewater license as soon as possible. Eligible for retest as of Feb. 14.
- Aaron assisted Troy, Ross and Joe on water main break on Feb 13.

- Amy and Trevor sampling for TENORMS as of Feb. 14..
- Thom ordered new Ultra Violet bulbs for UV disinfection.
- Waiting for warmer weather to fill and inspect north digester to see how many diffusers will need to be replaced.
- Still need an implementation plan to repair holding tank in digester.
- Schedule vactor to clean influent lift station.
- Thom has been working with Waste Management and their insurance to get flag pole light repaired after truck driver ran it over.
- Plant running well. Ammonia (NH_3) is at or below 0.20mg/l, Nitrates (NO_2) are at or below 4.00mg/l. Moderate activity in microscope, stalks are becoming more prevalent in slides. Foam on SBR's is approximately 50% coverage under aeration and SBR #1 is showing signs of open space during idle periods with no aeration, which is a good sign that it is not progressing. Thus far, the operations staff at UMCRWWTF have been able to operate the SBRs this year without the need for chemical addition of PAX-14 (polyaluminum chloride).
- Ongoing safety issues with trucks pulling into Pilot and parking in front of our access gate. The plant must be accessible 24 hours a day. Monument Police have been notified, however they don't seem to be doing much about it.

Public Comment:

- None

Meeting adjourned at 2:40 pm to Executive Session – CRS §24-6-402(4)(a) Real Property Negotiations, CRS §24-6-402(4)(a) Contract Negotiation for Long Term Water Contract with CSU, and CRS §24-6-402(4)(b) Legal Advice regarding Case No. 2021CW3044 & 2021CW3058. Deardorff motion to move, Vanderschuere second, all aye.

Meeting adjourned out of executive session with no reportable action taken.

These minutes are respectfully submitted for record by Tanja Smith on February 17, 2022.

83%

DONALA WATER & SANITATION DISTRICT

Statement of Revenues and Expenditures - 2022 DONALA SUMMARY

From 1/1/2022 Through 3/1/2022

	Total Budget - Revised	Current Year Actual	Percent Total Budget Remaining - Revised
OPERATING REVENUE			
WATER SALES	3,578,288.00	495,579.66	(86.15)%
EFFLUENT SALES	150,000.00	49,227.26	(67.18)%
SEWAGE SERVICE	1,394,480.00	334,786.92	(75.99)%
INSTALLATION FEES	15,000.00	1,500.00	(90.00)%
TAP FEES	170,000.00	17,000.00	(90.00)%
WATER DEVELOPMENT	65,000.00	6,500.00	(90.00)%
SEWER DEVELOPMENT	25,000.00	2,500.00	(90.00)%
PROPERTY TAX	2,209,105.00	19,648.76	(99.11)%
AUTO TAX	200,000.00	36,228.53	(81.89)%
AVAIL. OF SERVICE	5,250.00	(350.00)	(106.67)%
OPERATING INTEREST	4,800.00	1,517.31	(68.39)%
INVESTMENT INTEREST	35,000.00	2,678.11	(92.35)%
WATER INVESTMENT FEE	40,000.00	4,000.00	(90.00)%
MISC. REVENUE	35,000.00	4,910.41	(85.97)%
FL REIM. REVENUE	0.00	25,549.21	0.00%
Total OPERATING REVENUE	7,926,923.00	1,001,276.17	(87.37)%
EXPENSES & CAP PROJECTS			
EXPENDITURES			
CHEM/LAB	125,300.00	8,062.81	93.57%
REPAIR/MAINTENANCE	344,000.00	23,701.69	93.11%
TRUCK/BACKHOE	78,000.00	3,193.67	95.91%
UTILITIES	479,692.00	45,616.11	90.49%
TOOLS AND EQUIPMENT	101,000.00	0.00	100.00%
INSPECTION REFUNDS	2,000.00	0.00	100.00%
WASTE PLANT EXPENSES	741,742.00	81,996.94	88.95%
W & P LOAN PAYBACK	318,866.00	162,420.64	49.06%
AUDIT	23,896.00	0.00	100.00%
RESIDUALS MGMT.	180,000.00	14,549.84	91.92%
INSURANCE	292,629.00	130,092.25	55.54%
LEGAL EXPENSES	65,000.00	6,584.37	89.87%
OFFICE EXPENSES	65,400.00	4,664.06	92.87%
OFFICE EQUIPMENT	5,000.00	0.00	100.00%
TELEPHONE	33,000.00	6,076.66	81.59%
ENGINEERING	150,000.00	17,550.99	88.30%
SALARIES	661,851.00	105,220.59	84.10%
PAYROLL TAXES	50,301.00	8,049.36	84.00%

DONALA WATER & SANITATION DISTRICT

Statement of Revenues and Expenditures - 2022 DONALA SUMMARY

From 1/1/2022 Through 3/1/2022

	Total Budget - Revised	Current Year Actual	Percent Total Budget Remaining - Revised
457 PLAN	46,330.00	42,590.95	8.07%
CONTRACT SERVICES	177,755.00	14,216.11	92.00%
AFCURE	0.00	0.00	0.00%
PUBLICATION	16,000.00	149.75	99.06%
FEES, PERMITS, DUES	15,000.00	11,814.24	21.24%
TRAINING	30,000.00	8,101.61	72.99%
INVESTMENT EXPENSES	5,900.00	488.10	91.73%
COUNTY TREAS. FEE	33,200.00	294.73	99.11%
2020 BOND	429,849.00	112,424.50	73.85%
CSU WTR/BOWW	1,792,813.00	18,349.81	98.98%
MISCELLANEOUS EXP	10,000.00	1,395.05	86.05%
Total EXPENDITURES	6,274,524.00	827,604.83	86.81%
CAPITAL PROJECTS			
CAPITAL PROJECTS	6,845,000.00	345,901.42	94.95%
WATER RIGHTS	60,000.00	0.00	100.00%
Total CAPITAL PROJECTS	6,905,000.00	345,901.42	94.99%
Total EXPENSES & CAP PROJECTS	13,179,524.00	1,173,506.25	91.10%

JANUARY SPENDABLE	
CAPITAL RESERVE	$3,218,362
CHECKING	202,733
STRATEGIC PLANNING	1,002,326
OPERATING RESERVE	733,900
DEBT SERVICE FUND	1,250,000
PROPERTY TAX	4,732,839
TOTAL	$11,140,160

FEBRUARY SPENDABLE	
CAPITAL RESERVE	3,218,604
CHECKING	160,944
STRATEGIC PLANNING	1,002,401
OPERATING RESERVE	733,956
DEBT SERVICE FUND	1,250,000
PROPERTY TAX	$4,458,167
TOTAL	$10,824,072

	DONALA GOVT. - FEB. 2022			
DATE	VENDOR	CK#	AMOUNT	DESCRIPTION
02/01/22	INTERSECTIONS INC.	1629	$150.00	IDENTITY PROTECTION
02/01/22	CYBERBASEMENT	1630	$40.00	MARCH WEBSITE MAINTENANCE
02/01/22	JEFFREY HODGE	1631	$218.96	4TH QTR MILEAGE REIMBURSEMENT
02/01/22	JOHN DEERE FIN	1632	$52.32	GLOVES, NUTS, BOLTS, & WASHERS
02/01/22	MERCEDES LAVOY	1633	$100.00	TITLE CHECK REFUND
02/01/22	SBS SERVICES GROUP	1634	$321.50	JANITORIAL SERVICES JANUARY
02/01/22	TIMBERLINE	1635	$27,330.00	HOLBEIN FILTER CONTROL RETROFIT
02/01/22	FOUNTAIN MUTUAL IRRIGARTION	1636	$129.33	REIMBURSEMENT FOR 2020-2021 TRANSIT LOSS
02/03/22	AXIS	1637	$49.41	BASE & USAGE KYOCERA COPIER
02/03/22	COMCAST	1638	$117.88	INTERNET@ R HULL THRU 03/03/22
02/03/22	FILTER TECH SYSTEMS	1639	$3,100.00	MEDIA CORE SAMPLES & TESTING
02/03/22	MERRICK	1640	$3,955.00	INDIRECT POTABLE REUSE STUDY
02/03/22	POSTAL ANNEX	1641	$69.56	8A & 12A VIDEO CARD INFO
02/03/22	UTILITY NOTIFICATION CENTER	1642	$52.00	JANUARY 811 CALLS
02/03/22	USA BLUE BOOK	1643	$847.87	WATER CHECK VALVE
02/04/22	ANSWER-RITE	1644	$134.70	FEBRUARY ANSWERING SERVICE
02/04/22	CYBERBASEMENT	1645	$75.00	ADD 2022 TO BOARD INFO PAGES
02/04/22	O'REILLY AUTO PARTS	1646	$24.98	BLUE DEF, SNOW BRUSH
02/04/22	SERVICE UNIFORM	1647	$491.82	UNIFORM MAINTENANCE TRHU 01/25/22
02/04/22	WAYNE VANDERSCHUERE	1648	$416.53	LODGING & FOOD FOR WATER CONGRESS
02/04/22	VTI SECURITY	1649	$6,846.19	MAIN OFFICE PANEL SWAP
02/07/22	CEGR LAW	1650	$5,312.50	JANUARY GENERAL COUNSEL
02/07/22	COLO SPRGS UTILITIES	1651	$1,190.23	GAS THRU 01/31/22
02/07/22	FRONTIER IT	1652	$2,147.00	MONTHLY BILLING JANUARY
02/07/22	LRE WATER	1653	$36,024.73	PROFESSIONAL SERVICES THRU 01/25/22
02/07/22	PIKES PEAK REGIONAL WATER	1654	$11,814.24	ANNUAL DUES 2022
02/07/22	TIMBERLINE	1655	$659.00	SAN-HISTORIAN STOPPED COLLECTING DATA
02/07/22	WEX BANK	1656	$341.07	JANUARY FUEL EXPENSES
02/09/22	CHEETAH PRINTING	1657	$2,827.81	JANUARY BILLING
02/09/22	COMCAST BUSINESS	1658	$675.04	FEBRUARY FIBER LINE
02/09/22	JAMES NELSON	1659	$330.99	TITLE CHECK REFUND
02/09/22	THE GAZETTE	1660	$149.75	ADVERTISEMENT FOR BIDS - 16A
02/11/22	HAYES POZNANOVIC KORVER	1661	$1,271.87	LEGAL JANUARY 2022
02/11/22	RADIATION PROS	1662	$3,922.84	RADIOACTIVE MATERIALS LICENSING
02/11/22	SBS SERVICES GROUP	1663	$321.50	FEBRUARY JANITORIAL SERVICES
02/11/22	WELLS FARGO FINANCIAL	1664	$157.00	LEASE ON KYOCERA COPIER
02/11/22	AIRGAS USA	1665	$82.43	CYLINDER RENTAL ACETYLENE & OXYGEN
02/14/22	ALS GROUP USA	1666	$4,825.00	RADIUM TESTING FOR WELLS
02/14/22	BLACK HILLS ENERGY	1667	$633.05	GAS THRU 02/08/22
02/15/22	COMCAST	1668	$374.45	INTERNET@ MAINTENANCE & HOLBEIN
02/15/22	DPC INDUSTRIES	1669	$2,339.01	CAUSTIC SODA & CHLORINE
02/15/22	SPRINT	1670	$497.30	EMPLOYEE CELL PHONES
02/15/22	TYLER TECHNOLOGIES	1671	$2,860.00	CURRENT STATE PROCESS REVIEW
02/15/22	VERIZON WIRELESS	1672	$159.35	WILLOW CREEK DATA PLAN
02/18/22	CROSS DIAMOND ELECTRIC	1673	$1,995.00	REPAIR BREAKER - BAD CONNECTOR TO BUS
02/18/22	FORSGREN ASSOC	1674	$3,311.30	EL PASO COUNTY - WATER LOOP STUDY
02/18/22	HPE INC	1675	$136.00	FEBRUARY PREVENTIVE MAINTENANCE
02/18/22	TIMBERLINE	1676	$10,627.00	ANTEANNE ISTALL AT RMB
02/18/22	WINN-MARION BARBER	1677	$292.00	REMOTE KEYPAD MOUNT KIT
02/22/22	CO ANALYTICAL	1678	$455.00	WATER TESTS DATED 02/08/22
02/22/22	STANDARD INS	1679	$871.36	DISABILITY - MARCH 2022
02/23/22	COMCAST BUSINESS	1680	$481.63	PHONE BILL (719) 488-3603
02/23/22	CORE & MAIN	1681	$2,885.70	RING & COVERS FOR MANHOLES
02/23/22	TIMBERLINE	1682	$2,075.90	REPORTS FOR NEW YEAR/ HOLBEIN FIU RELOCATION
02/23/22	TYLER TECHNOLOGIES	1683	$32.50	FINANCIALS - COMPLETE DATA ANALYSIS

02/25/22	AMERICAN WATER WORKS	1684	$135.50	WATER DISTRIBUTION BOOKS
02/25/22	JOHN HAMLIN	1685	$99.29	TITLE CHECK REFUND
02/25/22	HYDRO RESOURCES	1686	$248,825.00	WELL 2A & 2D REHAB
02/25/22	PINNACOL ASSURANCE	1687	$2,409.07	WORKMENS COMPENSATION
02/25/22	SBS SERVICES GROUP	1688	$321.50	MARCH JANITORIAL SERVICES
02/25/22	TIMBERLINE	1689	$5,445.00	SCADA PROGRAMMING

DONALA WATER & SANITATION DISTRICT

Statement of Revenues and Expenditures - 2022 WASTE PLANT EXEC SUMMARY

From 1/1/2022 Through 2/28/2022

	Total Budget - Revised	Current Year Actual	Percent Total Budget Remaining - Revised
OPERATING REVENUE			
PD-DONALA	741,742.00	81,996.94	(88.95)%
FOREST LAKES O & M PAYMENTS	100,417.00	17,656.32	(82.42)%
TRIVIEW O & M PAYMENTS	717,106.00	132,132.13	(81.57)%
MISC. REVENUE	0.00	338.00	0.00%
Total OPERATING REVENUE	1,559,265.00	232,123.39	(85.11)%
EXPENSES & PROJECTS			
EXPENDITURES			
CHEMICAL AND LAB	120,000.00	14,752.10	87.71%
REPAIR/MAINTENANCE	193,800.00	13,293.25	93.14%
TRUCK/MOWER EXP.	2,000.00	392.70	80.36%
UTILITIES	330,000.00	56,017.55	83.02%
CONTRACT SERVICES	37,300.00	5,501.55	85.25%
BIOSOLIDS HAULING	91,155.00	12,244.25	86.57%
TOOLS AND EQUIP.	1,050.00	174.21	83.41%
INSURANCE	123,300.00	16,307.91	86.77%
OFFICE EXPENSE	2,500.00	159.07	93.64%
TELEPHONE	9,000.00	1,426.88	84.15%
DISTRICT ENGINEER	18,500.00	0.00	100.00%
SALARIES	447,301.00	85,241.92	80.94%
PAYROLL TAXES	33,548.00	5,827.02	82.63%
457 PLAN	31,311.00	23,306.59	25.56%
TRAINING	10,000.00	185.00	98.15%
FEES, PERMITS	15,000.00	0.00	100.00%
PUBLICATION	600.00	0.00	100.00%
MISCELLANEOUS	1,500.00	42.98	97.13%
AFCURE	41,400.00	2,558.74	93.82%
Total EXPENDITURES	1,509,265.00	237,431.72	84.27%
Total EXPENSES & PROJECTS	1,509,265.00	237,431.72	84.27%

	WASTE PLANT - FEB. 2022			
DATE	VENDOR	CK#	AMOUNT	DESCRIPTION
02/01/22	ACZ LABORATORIES	1297	$625.29	BASELINE DATED 01/13/22
02/01/22	INTERSECTIONS INC	1298	$54.00	IDENTITY PROTECTION
02/01/22	SBS SERVICES GROUP	1299	$223.50	JANITORIAL SERVICES JANUARY
02/03/22	POSTAL ANNEX	1300	$109.78	BALLAST REBUILD
02/03/22	REMCO EQUIPMENT	1301	$251.00	REPAIRED COOLER & BENT DISCHARGE TUBE
02/04/22	ACZ LABORATORIES	1302	$506.00	COMPLIANCE DATED 01/13/22
02/04/22	DENALI WATER	1303	$862.19	SLUDGE HAULS WEEK ENDING 01/28/22
02/04/22	O'REILLY AUTO PARTS	1304	$58.05	PARTS FOR SNOWBLOWER
02/04/22	SERVICE UNIFORM	1305	$439.60	UNIFORM MAINTENANCE THRU 01/25/22
02/04/22	WEBSTER ASSOCIATES	1306	$501.60	AIR IN-TAKE FILTERS
02/07/22	EVOQUA WATER	1307	$741.35	SERVICE CONTRACT FOR DI SYSTEM
02/07/22	FRONTIER IT	1308	$1,025.00	MONTHLY BILLING JANUARY
02/07/22	GRAINGER	1309	$22.35	SCRUB BRUSH AND SQUEEGEE
02/07/22	WASTE MANAGEMENT	1310	$2,152.67	JANUARY SLUDGE HAULS
02/09/22	GARRISON MINERALS LLC	1311	$5,245.71	MAGNESIUM HYDROXIDE SLURRY
02/09/22	MSC INDUSTRIAL SUPPLY	1312	$41.52	1" DIAMETER NEOPRENE SPRNG ROD
02/09/22	PUEBLO BEARING	1313	$58.68	BELT
02/11/22	DENALI WATER	1314	$819.80	SLUDGE HAULS WEEK ENDING 02/04/22
02/11/22	LAW FIRM OF CONNIE KING	1315	$700.00	PROFESSIONAL SERVICES JANUARY
02/11/22	SBS SERVICES GROUP	1316	$223.50	FEBRUARY JANITORIAL SERVICES
02/11/22	USA BLUE BOOK	1317	$780.23	GLOVES/ INDICATING DESICCANT
02/14/22	FOREST LAKES METROPOLITAN	1318	$125.88	JANUARY POTABLE WATER
02/14/22	HACH COMPANY	1319	$934.00	UVAS SENSOR
02/14/22	HOLBROOK SERVICE	1320	$1,240.47	REPLACED 3 CONTACTORS FOR HEATERS
02/15/22	COLORADO STATE TREASURER	1321	$9,072.00	BENEFIT CHARGES - REIMBURS. 4TH QTR
02/15/22	UV DOCTOR LAMPS	1322	$8,222.67	REPLACEMENT UV BULBS
02/18/22	AMERIGAS INC	1323	$7,295.17	PROPANE 1ST, 3RD, & 4TH TANKS
02/18/22	DENALI WATER	1324	$1,800.77	SLUDGE HAULS WEEK ENDING 02/11/22
02/22/22	ACZ LABORATORIES	1325	$1,820.28	COMPLIANCE, REG-85, & BASELINE
02/22/22	CENTURY LINK	1326	$217.88	INTERNET@ WASTE PLANT
02/22/22	GRAINGER	1327	$44.88	Y STAINER
02/22/22	PARKSON CORPORATION	1328	$313.01	SUBASSY/ SPLASH PLATE
02/22/22	SPRINT	1329	$732.20	EMPLOYEE CELL PHONES JAN & FEB
02/22/22	STANDARD INS	1330	$470.25	DISABILITY - MARCH 2022
02/22/22	UV DOCTOR LAMPS	1331	$2,268.47	BALLAST REBUILD
02/23/22	RAMPART PLUMBING	1332	$12.44	SPARE PVC PIPE FITTINGS
02/25/22	AMERIGAS INC	1333	$2,487.91	PROPANE 1ST, 2ND, 3RD, & 4TH TANKS
02/25/22	DENALI WATER	1334	$1,050.75	SLUDGE HAULS WEEK ENDING 02/18/22
02/25/22	SBS SERVICES GROUP	1335	$223.50	MARCH JANITORIAL SERVICES

CHANDLER INFORMATION: FEBRUARY 2022

GENERAL FUND: $2,305,059(invested) Market Value
$1,133,571 (Colorado State Bank)
Next Maturity Date: 04/12/2022
$150,000
BV RETURN: 0.58%

Donala Water & Sanitation District
Manager's Report
March 17, 2022

Radium Removal: The sample requirement at the Holbein Water Treatment Plant is currently suspended as it is offline during upgrades.

Holbein Upgrades: About 2/3 of the SCADA and electrical work has been completed. The sand blasting and repainting of the filters and clarifiers has been completed, March 11, 2022. Once most of the electrical work and SCADA upgrade have been installed the contactor will be in to install the filter material. The plant is scheduled to be back online mid-May 2022.

Well 2A & 2D: All of the piping and the pump and motor have been installed in both wells. They pump at the expected volumes: 350gpm+ for 2A and 150gpm for 2D. We are working to bring the wells back online.

Well 3D: Layne, has begun the rehibition of this well. This work is now scheduled to be completed April 2022.

Well 8A: This well will be cleaned and returned to service before May 2022. Layne is performing the work. The equipment is onsite to perform the work.

Well 12A: This well is scheduled to be cleaned and back online by May 2022. Layne is also doing the work on this well. They currently plan on bringing in a third rig to undertake this work.

Well 16A - Permitting and Drilling: The District has award and issued the notice to proceed to Layne. The preliminary noise study indicates that during the drilling there could be high noise levels. The district and our consultants are exploring means to mitigate the impact to the neighbors. We have also initiated the design and permitting to bring the necessary electrical power to the site.

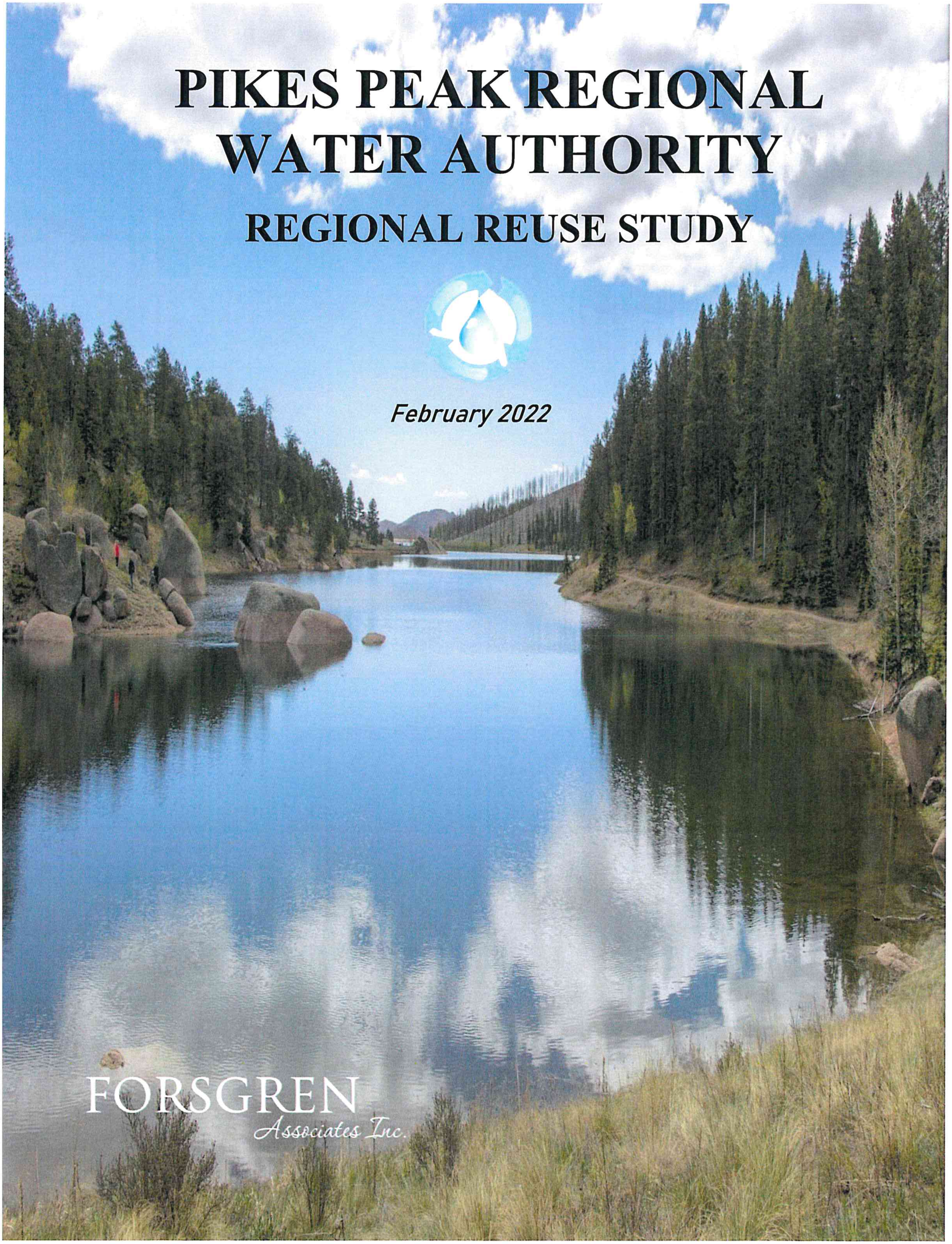
Pikes Peak Regional Water Authority (CSU LOOP): I have received the report. The report is attached.

County Loop: The Loop Group continues to meet regularly to move the possible project along. We will meet on March 22, 2022, to develop a finical and operation plan. There are many different assets that the participates bring to the project. We will work to value and understand how they will be compensated for the assets.

PIKES PEAK REGIONAL WATER AUTHORITY

REGIONAL REUSE STUDY

February 2022



FORSGREN
Associates Inc.

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ACKNOWLEDGMENTS

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FORSGREN Associates Inc.

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Forest Lakes Metropolitan District (FLMD)

Town of Monument

Security Water and Sanitation District (DWSD)

Triview Metropolitan District (TMD)

Woodmoor Water and Sanitation District (WWSD)

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ACRONYMS

AF: acre-feet
AFY: acre-feet per year
CCF: hundred cubic feet
CMD: Cherokee Metropolitan District
CSU: Colorado Springs Utilities
CWCB: Colorado Water Conservation Board
FT: feet
FT-MSL: feet, mean sea level
GAL: gallons
GPCD: gallons per capita per day
GPD: gallons per day
GPM: gallons per minute
HP: horsepower
IPR: Indirect potable reuse
KGAL: one thousand gallons
MCL: maximum contaminant level
MGAL: one million gallons
MGD: million gallons per day
PER: persons
PPRWA: Pikes Peak Regional Water Authority
SAFB: Schriever Air Force Base
SDS: Southern Delivery System
SFE: single family equivalent
WRF: water reclamation facility
WSMP: water supply master plan
WTP: water treatment plant
WWTF: waste water treatment facility

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EXECUTIVE SUMMARY

The Pikes Peak Regional Water Authority (PPRWA) is made up of several El Paso County water providers with shared interests in water supply planning and water quality. Many of the PPRWA water providers depend heavily on nonrenewable Denver Basin water supplies, which will not be economically viable over time given their declining water levels. Other providers also see the need to make full use of their water supplies to the extent practicable. Therefore, the PPRWA initiated this study to evaluate the feasibility of capturing and reusing return flows from lower Fountain Creek. The specific PPRWA members participating in this study are:

- Cherokee Metropolitan District (CMD)
- Colorado Springs Utilities (Springs Utilities)
- Donala Water and Sanitation District (DWSD)
- Forest Lakes Metropolitan District (FLMD)
- Town of Monument
- Security Water and Sanitation District (DWSD)
- Triview Metropolitan District (TMD)
- Woodmoor Water and Sanitation District (WWSD)

Following review of background information and previously developed concepts and alternatives specifically addressing the recapture, storage, and delivery of reuse water, our study team conducted interviews with each entity to identify how they could benefit from a regional reuse concept. We quantified participant return flows that can be recaptured from lower Fountain Creek for return and reuse. But we also identified how the return system could also allow for beneficial use (or better use) of their water rights available for diversion from lower Fountain Creek. Based on projected average-year return flows of 8,750 AFY in 2050 and water rights flows of 4,670 AFY, the planned system would deliver a total of 13,420 AFY.

After an initial screening with the participants, we developed a series of eight conceptual alternatives with diversions at or downstream of the Las Vegas WWTF and located on the east side of Fountain Creek and Interstate I-25, generally affording closer proximity to Springs Utilities' SDS transmission pipeline. Those alternatives vary with respect to the diversion, storage, treatment and conveyance of water from Fountain Creek into the SDS.

We then compared the alternatives through numerical scoring of: Selection Criteria, Site Development, Technical Criteria-Reservoir Storage and Conveyance, and Environmental/ Permitting Criteria. After review and adjustments, we moved forward with six alternatives for comparison on the bases of capital costs, operation and maintenance costs, total present worth and net production after water losses.

A regional water reuse system as described in this study is feasible and could prove to be very cost effective to implement once all costs are identified. Each participant can benefit from the "savings of scale" that a single regional system offers vs. having each entity independently develop their own system. The regional system could also provide the means for delivery of current and future water rights available from Fountain Creek. Overall costs for the recommended alternatives are shown in Table ES-1.

Table ES-1: Cost Comparison

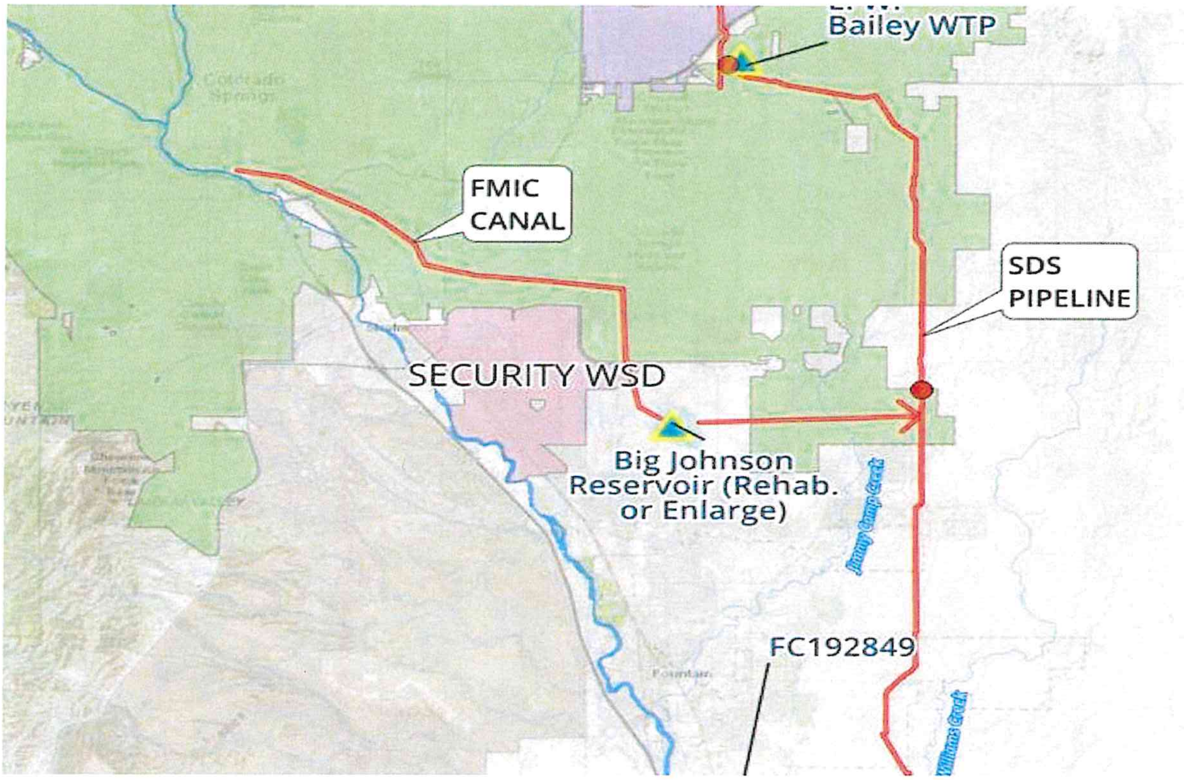
ALTERNATIVE	CAPITAL COST	ANNUAL O&M	TOTAL PRESENT WORTH	COST PER ACRE-FOOT DELIVERED
ALT A-2 **Without Pretreatment**	$14.6-18.7M	$0.25M	$27.4-31.4M	$2,790
ALT A-3 **With Pretreatment**	$46.0-50.1M	$1.44M	$69.7-73.6M	$6,140

When considering the yield and costs for each alternative, Alt A-2 is the lowest cost at $2,790 per AFY delivered if no pretreatment is required. Alt A-3 is the lowest cost at $6,140 per AFY delivered if pretreatment is required (see figures that follow).

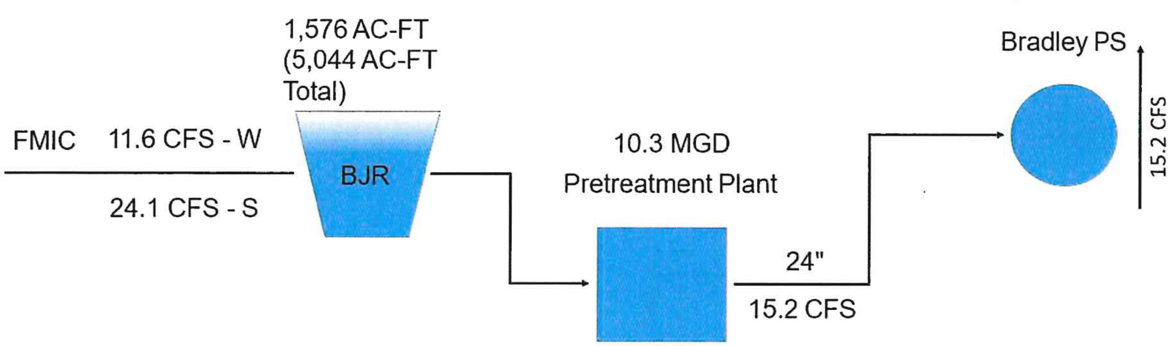
Costs need to be confirmed (or identified) for three critical topics before the full financial picture can be known. Specifically, those areas are: (1) FMIC/Big Johnson Reservoir; (2) pretreatment vs. treatment consolidation at the Bailey WTP; and (3) Springs Utilities charges for treatment/delivery.

- The alternatives making use of the FMIC canal and 500 AF of expanded storage in Big Johnson Reservoir are the more cost-effective options. The participants should open discussions with the rest of the FMIC ownership to explore the possibilities of how they can mutually benefit from shared use of the FMIC facilities as a key part of the regional reuse system.
- It will likely be more cost effective to consolidate treatment of Fountain Creek water at the SDS-Bailey WTP rather than provide some level of pretreatment at a separate facility. To confirm, Springs Utilities will need to determine what (if any) treatment modifications would be needed at Bailey and what operational costs could be incurred.
- Moreover, Springs Utilities will need to charge each of the other participants for their respective share of finished water treatment and delivery costs to points of connection to those other water systems. Those cost shares will need to be factored into the overall cost determination for each participant.

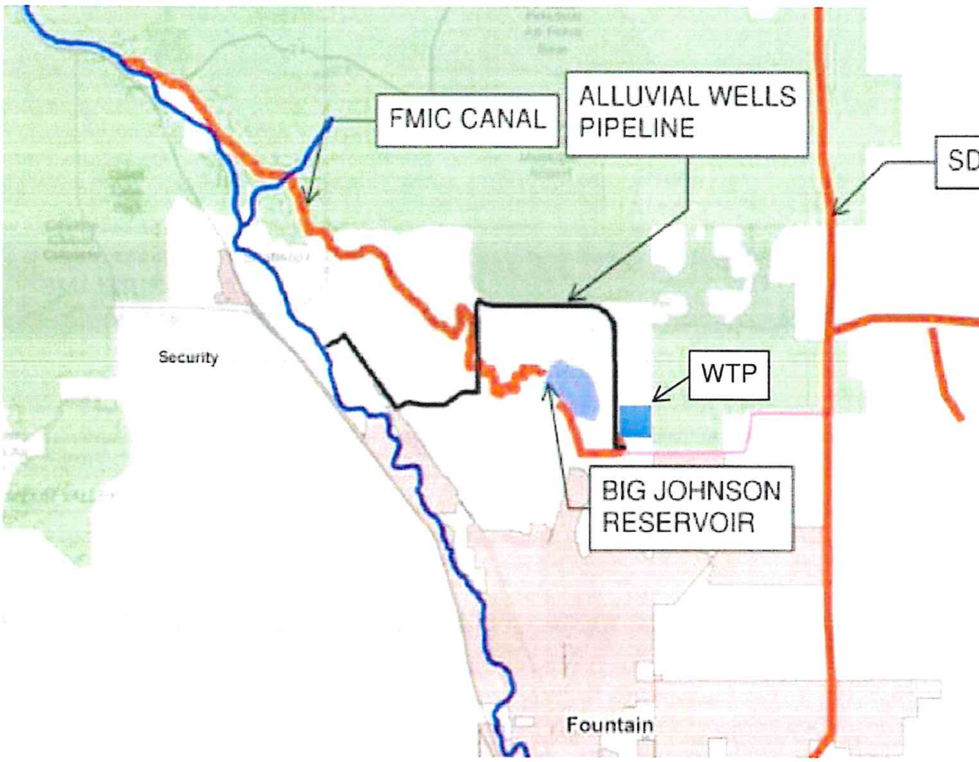
Map & Diagram AltA-2

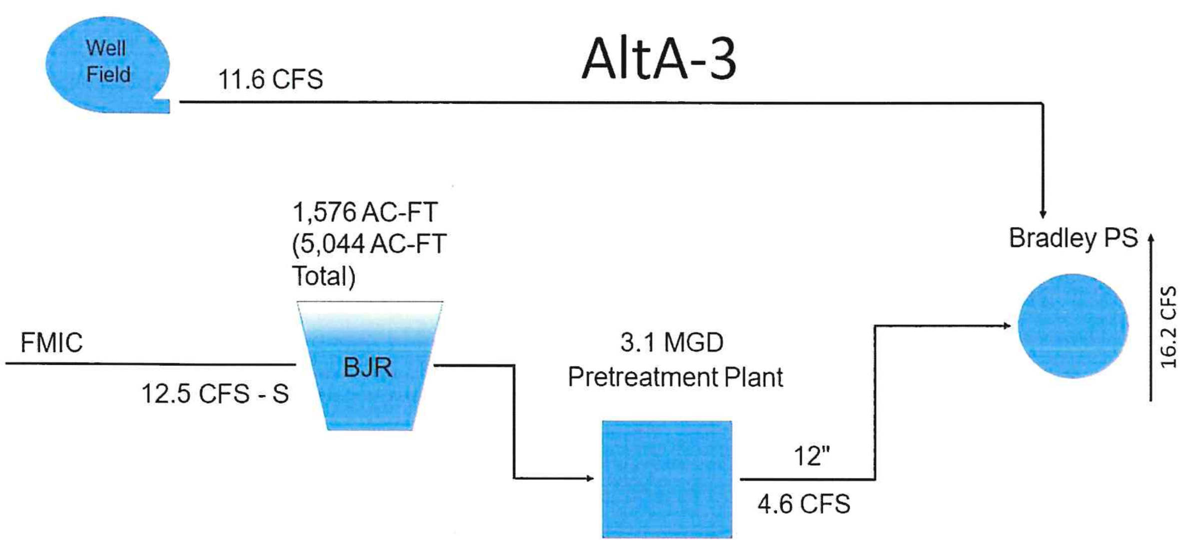


AltA-2



Map & Diagram AltA-3





CHAPTER 1
INTRODUCTION

The Pikes Peak Regional Water Authority (PPRWA) is made up of several El Paso County water providers with shared interests in water supply planning and water quality. At the forefront of discussion among the group's members is availability of water supply considering rapid population growth throughout El Paso County. Many of the PPRWA water providers depend heavily on nonrenewable Denver Basin water supplies, which will not be economically viable over time given their declining water levels. Other providers also see the need to make full use of their water supplies to the extent practicable. Therefore, the PPRWA initiated this study to evaluate the feasibility of capturing and reusing return flows from lower Fountain Creek. The specific PPRWA members participating in this study are:

- Cherokee Metropolitan District (CMD)
- Colorado Springs Utilities (Springs Utilities)
- Donala Water and Sanitation District (DWSD)
- Forest Lakes Metropolitan District (FLMD)
- Town of Monument
- Security Water and Sanitation District (DWSD)
- Triview Metropolitan District (TMD)
- Woodmoor Water and Sanitation District (WWSD)

This study builds upon concepts developed in prior PPRWA studies. The first of those was the Water Infrastructure Planning Study (WIPS) R. The WIPS took a broad view of alternatives to use Denver Basin supplies more efficiently, and acquire and deliver new, renewable water supplies to the Monument area. PPRWA's Regional Infrastructure Study (RIS) R in 2015 developed the concept of connecting Springs Utilities' Southern Delivery System (SDS) to CMD's Sundance Pipeline to provide a regional backbone for water deliveries from the Fountain to Monument areas, along with reservoir storage, treatment and pumping facilities. PPRWA's Area 3 Preliminary Engineering Report R provided greater detail on the northernmost of the three RIS project areas.

1.1 PURPOSE

The PPRWA members share an interest in securing more water supplies while also optimizing use of current supplies for a more sustainable water portfolio. In this Regional Reuse Study, we evaluate the physical facilities needed to capture return flows from lower Fountain Creek and deliver them to the respective service areas as potable water via Springs Utilities infrastructure. Additionally, some of the service providers have water rights that can be accessed from lower Fountain Creek in addition to their reusable return flows. We also consider in this study what additional facilities or upsizing would be needed to make use of those supplies as well.

This study identifies alternatives to divert, store, and treat water from Fountain Creek and cost effectively deliver it to each participating member's service area. Additionally, this analysis identifies other water storage needs within El Paso County that could also be addressed with the storage contemplated as part of this effort. The Regional Reuse Study facilitates a collaborative effort between participating entities in achieving a common goal to make best of their existing water supplies, while also positioning them to access additional supplies that may be developed in the Arkansas River basin.

1.2 SCOPING AND OBJECTIVES

The work of this Study was completed in four phases:

1. Reconnaissance

   This phase consisted of reviewing background information and previously developed concepts and alternatives. We reviewed project data and concepts performed in the region over the last 10 years specifically addressing the recapture, storage, and delivery of reuse water. We then prepared an inventory of previously identified water storage needs within El Paso County. Each participating water provider was interviewed to develop minimum operational criteria for storage, conveyance capacity needed, ability to connect to existing infrastructure, and general treatment requirements for potential recapture, storage, and delivery. We then prepared a summary table of water recapture, storage and delivery needs that could be met through regional cooperation.

2. Comparative Analysis

   This phase consisted of using the identified criteria to evaluate the viability of each concept. Based on feedback from the participants, we developed a set of qualitative and quantitative criteria to compare project concepts. Each criterion was numerically weighted then scores were tallied for each concept. Each was given a total score with the highest scoring concept receiving the top overall ranking.

3. Feasibility Analysis

   In this phase, we carried forward all of the alternatives and developed the concepts further to allow for some very preliminary cost comparisons. Each identified concept was evaluated for costs of diversion, storage, treatment and transmission. Capital, operational and maintenance, and total present-worth costs were compared and some of the more costly alternatives were screened out.

4. Refined Costs

   In the final phase of the study, we refined the conceptual capital, operational and maintenance, and total present-worth cost considerations for the top two recommended alternatives. The more favorable of two alternatives will depend on a closer analysis of whether pretreatment will be necessary prior to combining the Fountain Creek water with the SDS supply.

CHAPTER 2
RECONNAISSANCE

This chapter summarizes our review of background information and previously developed concepts and alternatives specifically addressing the recapture, storage, and delivery of reuse water. We also conducted interviews with each entity to identify how they could benefit from a regional reuse concept and their specific needs regarding collection, storage, treatment, and delivery components. Our reconnaissance work included the following:

- Collected and reviewed relevant project work performed in the region over the last 10 years, specifically addressing reuse water.
- Gathered data and formulated an inventory of previously identified water storage needs within El Paso County.
- Developed minimum operational criteria (conveyance capacities, storage volumes, potential treatment requirements, and delivery points to existing infrastructure).
- Formulated concept plans in sufficient detail to evaluate the viability of identified alternatives.
- Developed criteria to facilitate a qualitative screening of the alternatives.

Existing studies providing background information varied from large-scale planning documents covering all of El Paso County (e.g., El Paso County Water Master Plan, Forsgren 2019) to local, purpose-specific studies of particular infrastructure projects (e.g., Feasibility Study for Big Johnson Reservoir Enlargement, Applegate 2009). These studies were performed for a variety of different entities and purposes at varying levels of detail. However, we reviewed them for information relevant to the purposes of this study for consideration and possible inclusion. Below are brief summaries highlighting the relevance of a few prior studies.

2.1 POTENTIAL RETURN FLOWS AND CONVEYANCE

- The PPRWA Area 3 Preliminary Engineering Report proposed using flows from five water systems, assuming 75 percent of the effluent was available for recapture. This would add about 1680 to 2570 AFY of available water.
- The Monument Water Master Plan proposed making use of returns derived from lawn irrigation return flows (LIRFs) and treated wastewater effluent from the Tri-Lakes WWTP. Monument anticipated net return flows of 150 AFY, deducting the flows committed to augmentation.
- The Monument/Woodmoor Water Reuse Plan considered reusing flows by conveying and discharging WWTF effluent upstream of Monument Lake. This system would allow the water to be withdrawn from Monument Creek downstream of Monument Lake through a new raw water intake at Woodmoor's existing diversion. Monument's share would be treated through a new WTP and pumped into their water distribution system. WWSD would

be able to capture a greater share of their return flow than currently possible, either pumping the water to Lake Woodmoor or to their existing South WTP. This system could have the capacity to convey 0.76 MGD to Monument and 2.16 MGD to WWSD.

- The *El Paso County Water Authority Water Report* R proposed reuse options that distinguished between the northern and southern water providers in the region. The northern water providers would capture treated wastewater return flows using a new or existing reservoir. All but one of the southern water providers are already interconnected and have the means to reuse water via a system of water rights in Pueblo Reservoir and wells in the Widefield alluvial aquifer. Although the southern providers have a system in place, they still need raw water storage to aid in the reuse/recapture efforts.
- The Springs Utilities *Integrated Water Resource Plan Tech Memo No. 23* explored using available SDS capacity in the months of May-September and October-April. The October-April window showed sufficient capacity to convey all regional demands considered. Up to 36,000 AFY total could be conveyed.

2.2 STORAGE

- The *PPRWA Area 3 Preliminary Engineering Report* options included:
  - Home Place Ranch Reservoir, which would be newly constructed,
  - Enlargement of Monument and Woodmoor Lakes, identified as too costly for the minimal storage increase,
  - Aquifer storage and recovery (ASR) well conversions in Springs Utilities' Northgate well field, and
  - Upper Black Squirrel Creek (UBSC) alluvial storage using existing CMD water transmission lines that cross the basin.
- The PPRWA Regional Infrastructure Study included the following storage options:
  - Fountain gravel pits would store water from Fountain Creek, with storage capacity of 4,100 – 15,900 AF.
  - Callahan Reservoir could be enlarged from its current storage capacity of 674 AF. The reservoir is filled with Fountain Creek water conveyed by the Chilcott Ditch. The enlargement of Callahan would increase storage capacity to 3,200-8,400 AF.
  - Big Johnson Reservoir could be enlarged from its current capacity of 5,000 AF to its design capacity of 10,000 AF. Big Johnson Reservoir is filled from Fountain Creek using the FMIC Canal.
- The 2009 Feasibility Study for Big Johnson Reservoir Enlargement proposed the dam crest be raised 15 feet to create more storage. This was considered the most feasible option in the study and would increase storage by 5,000 AF.
- The El Paso County Water Authority Water Report outlined similar options for storage as in the PPRWA Study including:
  - Purchase of Lake Woodmoor, however, the reservoir was under restrictions from a dam safety standpoint. This option, if viable, would yield 936 AF of capacity.

  - Monument Lake to be used as a future terminal storage facility following rehabilitation.
  - Bristlecone and Pinion Reservoirs were considered surplus storage that could aid in regulating direct flow rights.
  - Springs Utilities could offer storage if available in either Bostrom or Williams Creek Reservoirs, if constructed, to other county water providers.
  - Jimmy Camp and New Forest Lakes Reservoirs could be used as reuse storage. The reservoirs were estimated to have sufficient storage capacity to supply 2,550 AF and 2,480 AF, respectively. The total supply of 7,440 AFY would potentially meet demands for the northern water providers that took part in the study.
  - Alluvial storage in the UBSC Designated Groundwater Basin would include rapid infiltration basins for indirect potable reuse of CMD's treated effluent.
  - Gravel pits in the Fountain area could be converted into water storage reservoirs.

- *The City of Fountain Gravel Pit Reservoir Feasibility Study* reviewed the feasibility of using two gravel pits for two separate uses; augmentation, and pre-treatment. Three different gravel pits were considered in the study, with Schmidt and LaFarge being the two pits considered able to meet the target volume of 1,400 AF – 5,000 AF.
- *The Springs Utilities Integrated Water Resource Plan Tech Memo No. 23* explored the Lower Arkansas and the Upper Williams Creek Reservoir Expansion (later named Bostrom Reservoir) as potential storage options. Conveyance and storage possibilities for the Upper Williams Creek Reservoir would store 40,000 AF – 50,000 AF. This option was selected due to being readily available to provide new supply storage in the best location for meeting local demands.
- *The Springs Utilities Regional Water and Wastewater Service Technical Studies* presented new projects that were added to the Integrated Water Resource Plan buildout portfolio, including the expansion of Bostrom Reservoir and Fountain Creek Effluent Storage. These projects would add up to 22,000 AF and 20,000 AF respectively.
- *In Bird Strike Hazard Assessment for LaFarge Reservoir*, the City of Fountain proposed acquiring the LaFarge property to be used as a storage reservoir. This would allow it to store up to 2,500 AFY of water supplied from the SDS pipeline as the City expected water demands to increase significantly in the following years.

2.3 PARTICIPANT INTERVIEWS

As part of this study, the eight participating entities were interviewed about potential reuse opportunities through future recapture, storage, and delivery projects. Representatives of each entity were asked the following questions, and their responses are summarized in Appendix II.

- Why is this organization participating in this study?
- Each organization has participated in the Regional Infrastructure Study and the El Paso County Water Master Plan and has completed other studies specific to its own needs. In light of said studies, what has changed and what is still true or current?
- What is the organization's most significant challenge with respect to the indirect reuse of reusable return flows?
- Any indication that the current trajectory toward build-out is going to accelerate, decelerate, or change in magnitude?
- Does the organization have organizational or legal challenges that must be surmounted in order to participate in shared or co-developed infrastructure, e.g., limitation on being a co-applicant in new water right applications?
- Is the organization in the process of acquiring or changing any current supplies that are pertinent to this study in the timeframe within this study?
- Are there any 'in system' water quality issues that would be exacerbated or mitigated with the import of (a) new water source(s), i.e., treated, partially treated, untreated?
- Does the organization have adequate storage currently and is there an estimate of future storage needs, either solely or cooperatively?
- Can you describe any reuse and/or storage alternatives that you have considered in the past? If so, which ones do you think hold the most promise? On your own accord or with regional partners?
- What alternatives do you think hold the most promise for your organization, whether previously evaluated or not?
- Do you have any reports or tech memos (other than what is included in the RFP References) that will help us better understand those alternatives?
- What alternatives seem most promising if your organization has to act on its own accord?

Responses to these questions were considered in development of the alternatives considered in the following chapters. The specific data requested from each entity are listed below:

- Reusable return flows to be recaptured
  - Current
  - Buildout (2050)
- Location of return flows
- Desired location for delivery
- Operational timing needs (immediate delivery vs. delayed/timed delivery)
- Reuse storage need
- Project timing need
- Secondary – Volumes, locations and rates for the collection, storage, and delivery of other water supplies

CHAPTER 3
AVAILABLE FLOWS

This chapter identifies the primary interest of this Study: quantifying participant return flows that can be recaptured from lower Fountain Creek for return and reuse. But a secondary benefit of a conceptual reuse plan would be to also allow the participants to make beneficial use (or better use) of their water rights available for diversion from lower Fountain Creek. Those potential flows are also identified in this chapter.

3.1 RETURN FLOWS

Return flows available for reuse consist of water that is "new" to the surface water system—water for which there are no ownership claims from downstream users. In El Paso County, available return flows are primarily derived from:

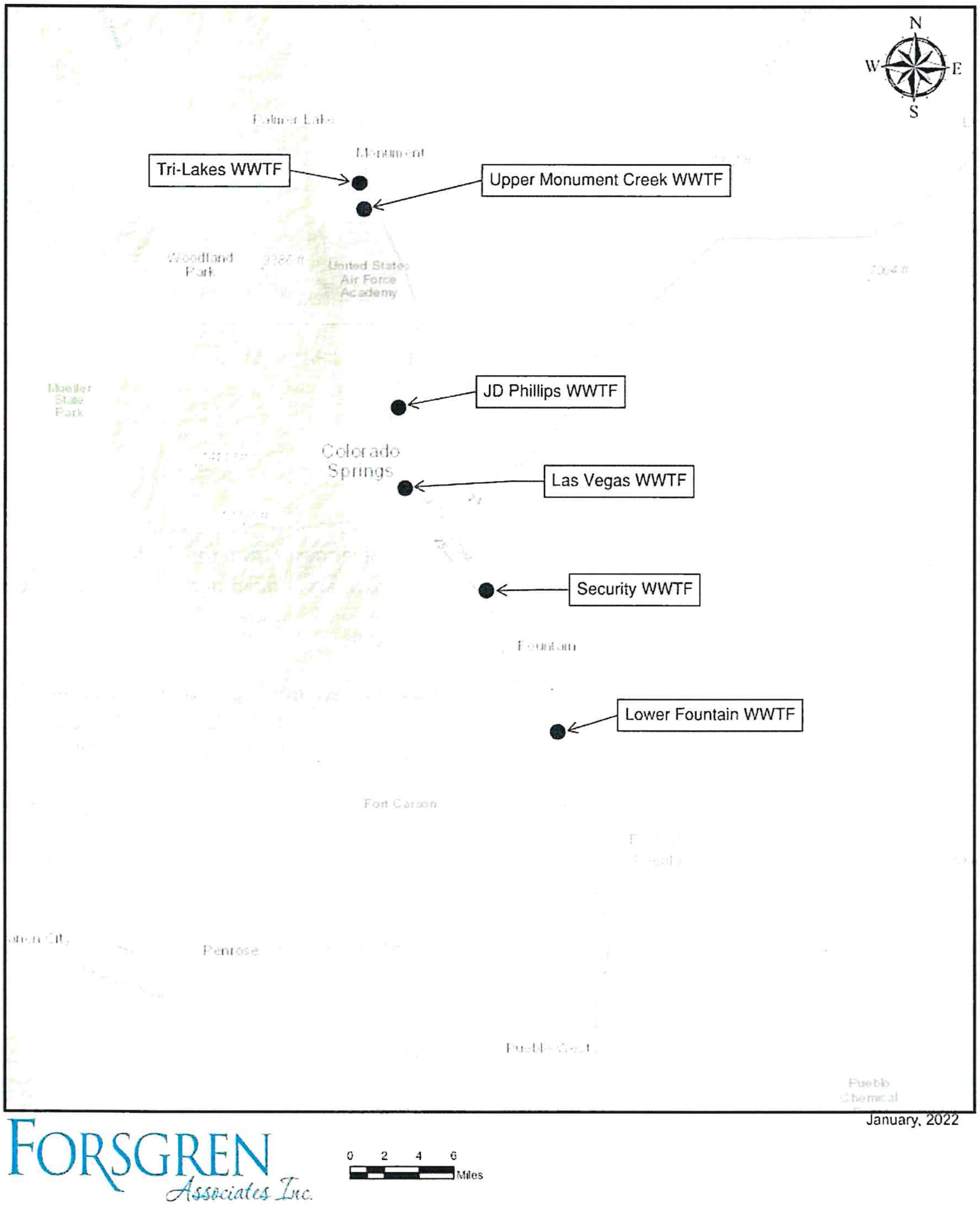
- **Nontributary Groundwater.** Several water providers in northern and eastern El Paso County rely heavily on pumping Denver Basin groundwater from bedrock aquifers having no significant influence on surface water flows.
- **Transmountain Diversions.** Springs Utilities and other water providers in southern El Paso County benefit from flows diverted into the Arkansas River basin from the West Slope.
- **Consumptive Portion of Water Rights.** Many water providers convert agricultural water rights for municipal use. The portion of agricultural water previously consumed through crop evapotranspiration may become available as a return flow.

Once water from these sources is used within a service provider's system, a portion of it accrues to a stream such as Monument Creek or Fountain Creek primarily in the form of treated wastewater effluent. That effluent is from indoor water usage at a fairly constant rate year-round. A small share of reuse returns can be attributed to lawn irrigation return flows (LIRFs) during the irrigation season, April through October. But for purposes of this study, we will consider reuse return flows to be relatively constant year-round.

Treated wastewater return flows from five of the eight participants are currently discharged into Monument Creek from one of two treatment facilities. The Tri-Lakes WWTF in southwest Monument treats flows from Monument and WWSD (in addition to Palmer Lake, see Figure 3.1). The Upper Monument Creek WWTF treats flows from DWSD, TMD and FLMD.

In an offer for regional consolidation, Springs Utilities has proposed that those two WWTFs be decommissioned and that all flows be conveyed by a new North Monument Creek Interceptor (NMCI) to Springs Utilities' JD Phillips WWTF. That WWTF has sufficient capacity available for consolidation, and can more readily meet increasingly stringent effluent limits for phosphorous and nitrogen. An added benefit of the interceptor would be to reduce stream losses to the return flows. Whether the five Monument-area participants join Springs Utilities in developing NMCI or not, their return flows will still be discharged into Monument Creek and available downstream of its confluence with Fountain Creek.

Figure 3-1: Area WWTFs on Monument and Fountain Creeks



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The majority of Springs Utilities' treated wastewater flows are discharged into Monument Creek at the JD Phillips WWTF, and into Fountain Creek at its Las Vegas WWTF. SWSD's flows are treated at its own WWTF downstream of the Las Vegas WWTF for discharge to Fountain Creek. A small portion of Springs Utilities' flows are treated and discharged even further downstream at the Lower Fountain WWTF.

CMD has no current return flows discharged into the Fountain Creek basin. All treated wastewater flows from their UBSC WWTF are conveyed to recharge basins in the UBSC Basin aquifer east of Colorado Springs. A portion of that flow is pumped from a downgradient well field for indirect potable reuse within CMD's service area. CMD may consider future scenarios that would result in having return flows or water rights available from lower Fountain Creek.

Based on the background documents review and participant interviews, Table 3-1 summarizes the expected reusable return flow rates for participants. The storage volumes needed for reuse should be understood as narrative or qualitative in nature based on existing studies or participant estimates. The subsequent phase of this Study, Comparative Analysis, develops conceptual plans for operation considering the dynamics of diversion and conveyance rates, necessary storage volume, and forecast treatment capacity.

Table 3-1: Reusable Return Flows

Entity	Location / Notes	Wastewater Effluent Flow – Current Conditions		Wastewater Effluent Flow - 2050 Conditions	
		[AFY]	[cfs]	[AFY]	[cfs]
CMD	Not currently a discharger to the Fountain Creek system.	n/a	n/a	n/a	n/a
Springs Utilities	Discharge from JD Phillips and Las Vegas WWTFs (potentially Lower Fountain WRRF)	3,620	5.00	3,620[1]	5.00
DWSD	Return flows from DBGW & Willow Creek discharged from UMCWWTF	507	0.700	507	0.700
FLMD	Return flows from DBGW & Beaver Creek /Bristlecone Reservoir discharged from **UMCWWTF**	53	0.073	203	0.280
TMD	Return flows from DBGW & transferred ag water rights (under development) discharged from UMCWWTF	405	0.560	688	0.950
Town of Monument	Return flows from DBGW discharged from TLWWTF	145	0.200	574	0.793
Security Water and Sanitation District	Return flows from transferred ag water rights discharged from Security WWTF	1,000	1.38	2,000	2.76
Woodmoor Water and Sanitation District	Return flows from [2]DBGW & transferred ag water rights (under development) discharged from TLWWTF	652	0.900	1,160	1.60
Total		**6,382**	**8.81**	**8,752**	**12.09**

[1] Utilities expects to expand its IPR/DPR reuse significantly by 2070 up to the goal of 50-75 MGD capacity set in the 2017 IWRP. Such increase may be accomplished by a significant expansion of the system identified in this study or by a separate system

3.2 WATER RIGHTS FLOWS

As previously noted, water rights flows owned by the participants and available on lower Fountain Creek could be accessed through some upsizing of the infrastructure needed to recover and return their reuse flows. Those water rights are listed in Table 3-2. They are generally available for diversion during the irrigation season, April through October.

Table 3-2: Water Rights for Delivery

Entity	Location/Notes	Water Rights (AFY)
Springs Utilities	NA	NA
DWSD	Laughlin Ditch	300
FLMD	NA	NA
Monument	NA	NA
SWSD	Fountain Creek	1,000
TMD	FMIC Shares	740
WWSD	JV Ranch	2,630
TOTAL		**4,670**

CHAPTER 4
ALTERNATIVES

For each of the entities with return flows and water rights available within the Fountain Creek basin, we reviewed a number of conveyance and storage possibilities. After an initial screening with the participants, we developed a series of conceptual alternatives with diversions at or downstream of the Las Vegas WWTF and located on the east side of Fountain Creek and Interstate I-25, generally affording closer proximity to Springs Utilities' SDS transmission pipeline.

Those eight alternatives vary with respect to the diversion, storage, treatment and conveyance of water from Fountain Creek into the SDS:

ALTERNATIVE	DIVERSION	STORAGE RESERVOIR	SDS CONNECTION
A-1	FMIC Canal	Big Johnson	Bailey WTP
A-2	FMIC Canal	Big Johnson	Bradley Pump Station
B-1	Chilcott Canal	Callahan	Bailey WTP
B-2	Chilcott Canal	Callahan	Williams Creek Pump Station
B-3	New Diversion & Pipeline	Callahan	Williams Creek Pump Station
B-4	Modified Owen & Hall Diversion & Pipeline	Callahan	Williams Creek Pump Station
C-1	Chilcott Canal	New Williams Creek via Callahan	SDS Transmission Line
C-2	New Diversion	New County Line	SDS Transmission Line

These initial alternatives are depicted in the figures that follow, along with a description of each. Conceptually, each alternative was thought to possibly include some level of pretreatment to assure compatibility with SDS water quality prior to connecting to the SDS. With each, the water would be treated to finished standards at the Bailey WTP, and conveyed to the participants via the Springs Utilities distribution system.

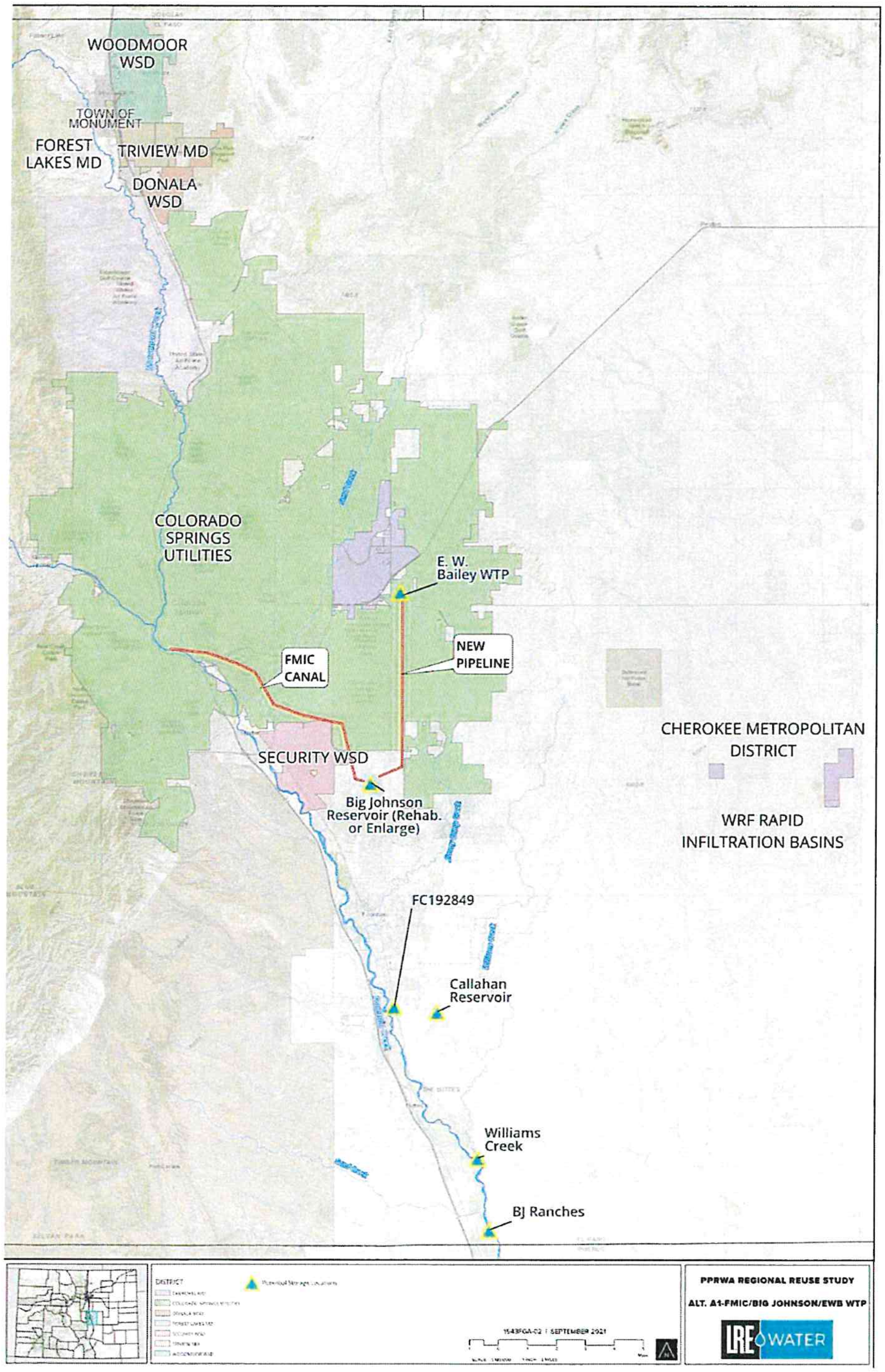


Figure 4-1: Alt A-1

Alt A-1 uses the FMIC canal to divert water from Fountain Creek to Big Johnson Reservoir. A new pipeline would be built to take water from Big Johnson Reservoir to the Bailey WTP.

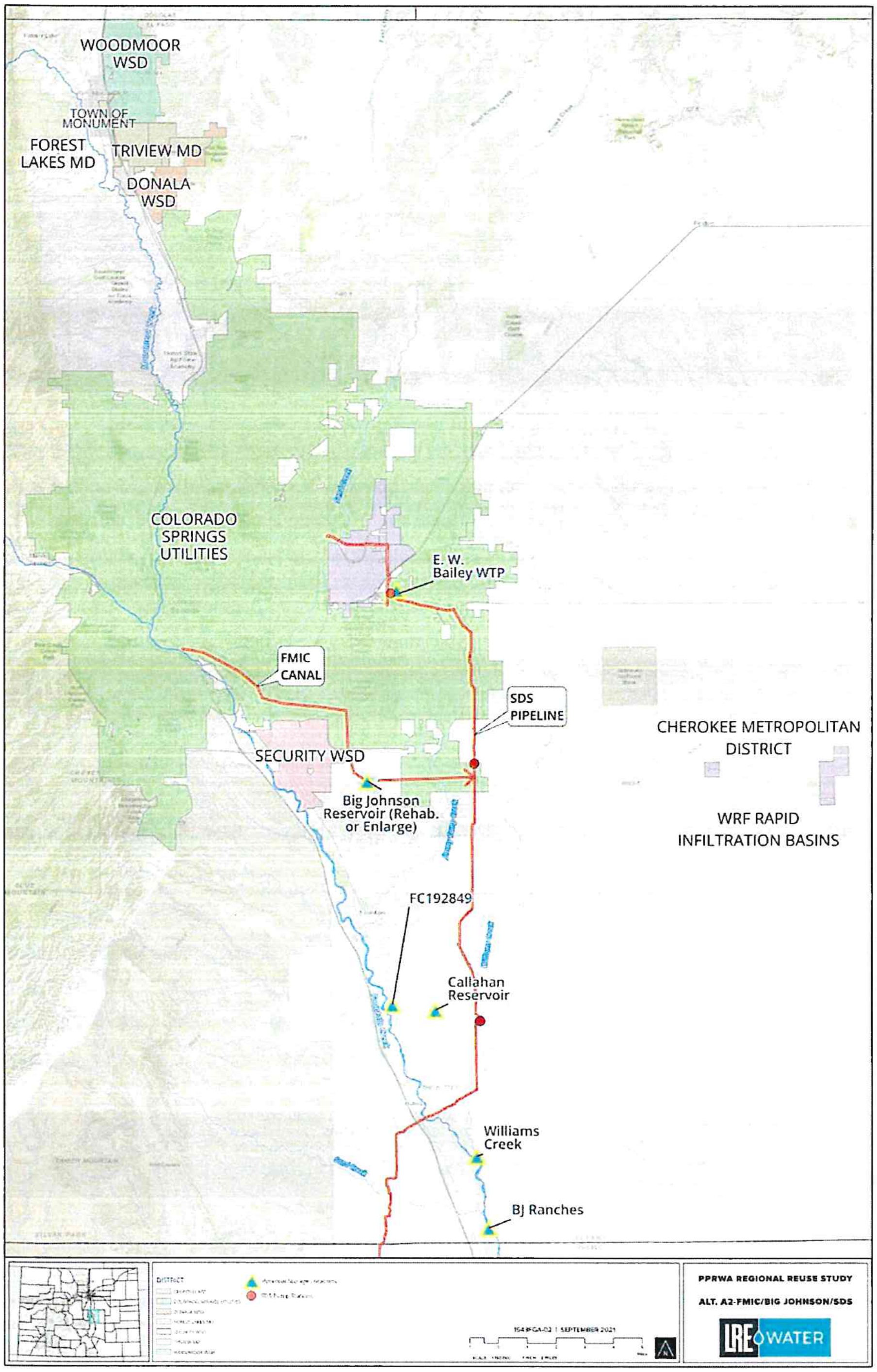


Figure 4-2: Alt A-2

Alt A-2 uses the FMIC canal to divert water from Fountain Creek into Big Johnson Reservoir. A new pipeline would convey water from Big Johnson Reservoir to the SDS Bradley Pump Station.

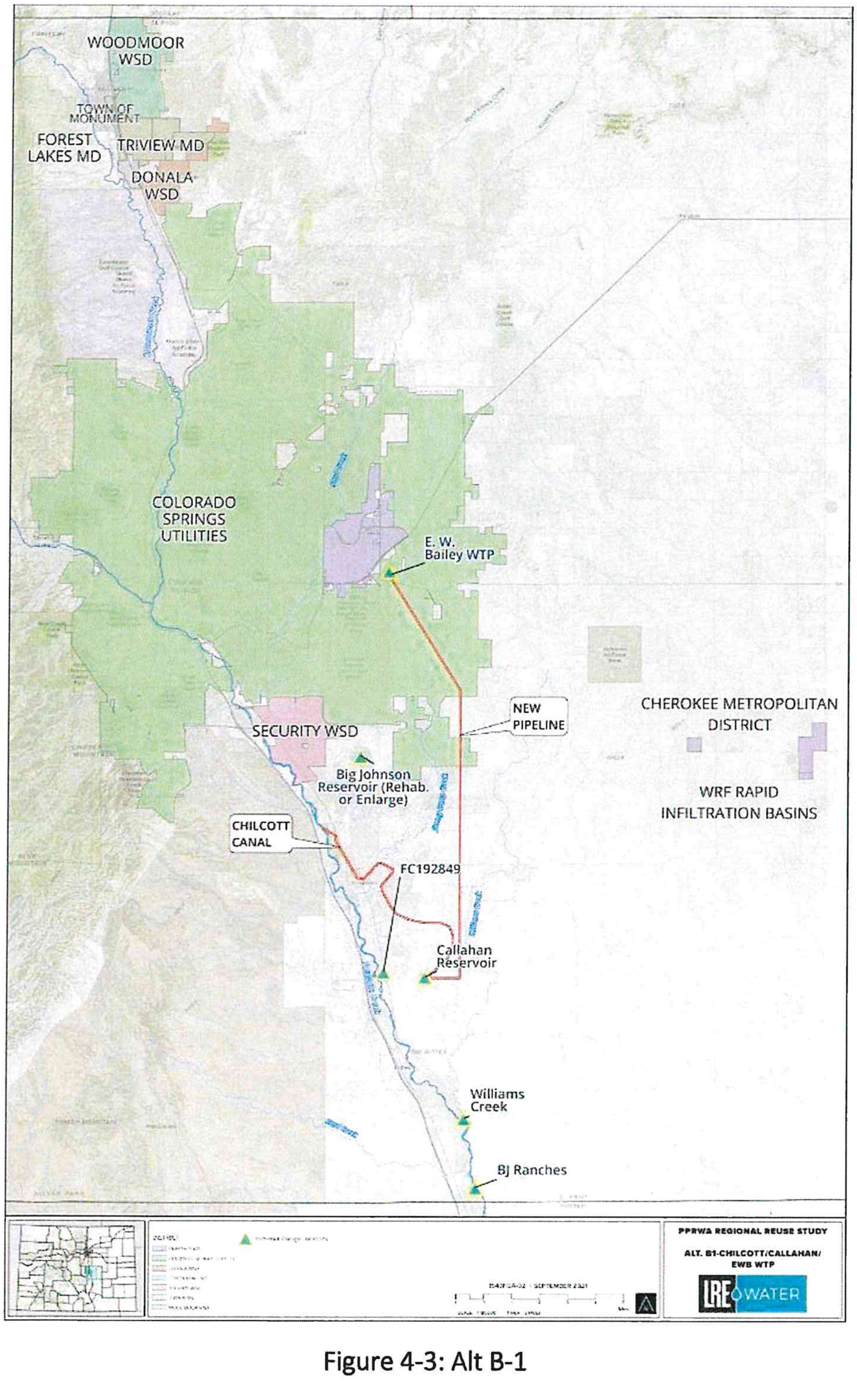


Figure 4-3: Alt B-1

Alt B-1 uses the Chilcott canal to divert water from Fountain Creek to Callahan Reservoir. A new pipeline would be constructed to convey the water from Callahan Reservoir to the Bailey WTP.

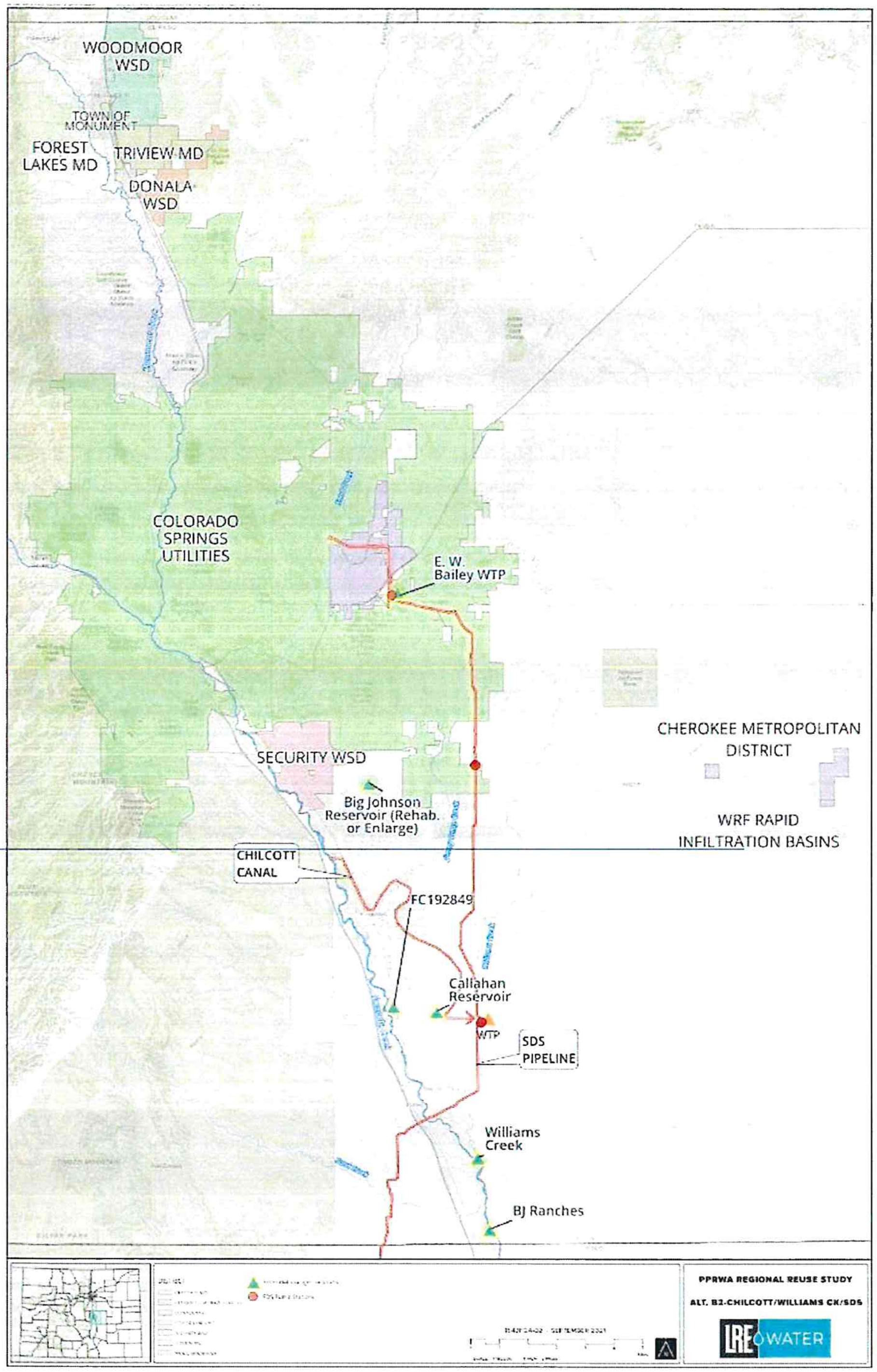


Figure 4-4: Alt B-2

Alt B-2 uses the Chilcott canal to divert water from Fountain Creek to Callahan Reservoir for storage. Water would be piped from Callahan Reservoir to the SDS Williams Creek Pump Station.

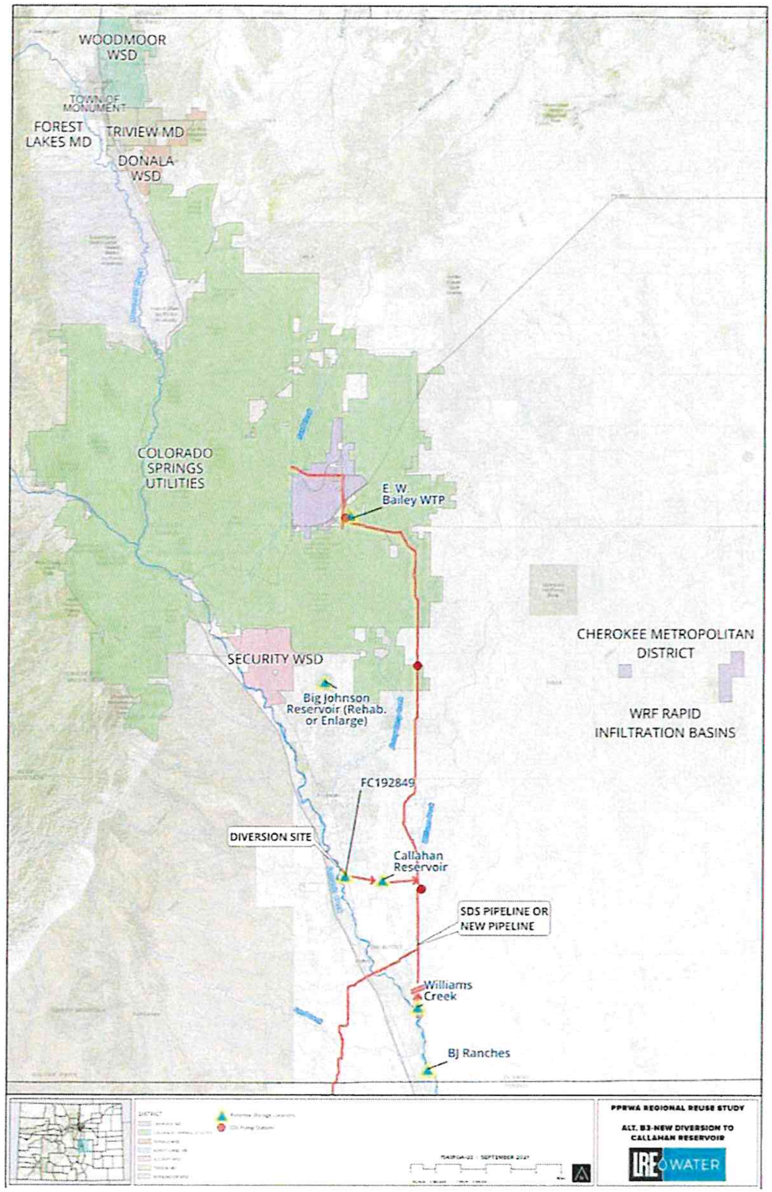


Figure 4-5: Alt B-3

Alt B-3 would use a new diversion and pipeline from a location previously identified as a possible detention pond site by the Fountain Creek Flood Control District R to convey water from Fountain Creek to Callahan Reservoir. Water from Callahan Reservoir would be piped over to the SDS Williams Creek Pump Station.

Alt B-4 would similarly use a modified diversion (close to the Alt B-3 diversion) to convey water from Fountain Creek to Callahan Reservoir. The Owen & Hall diversion structure would be modified to provide an outlet on the east side of the creek. Water from Callahan Reservoir would be piped over to the SDS Williams Creek Pump Station.

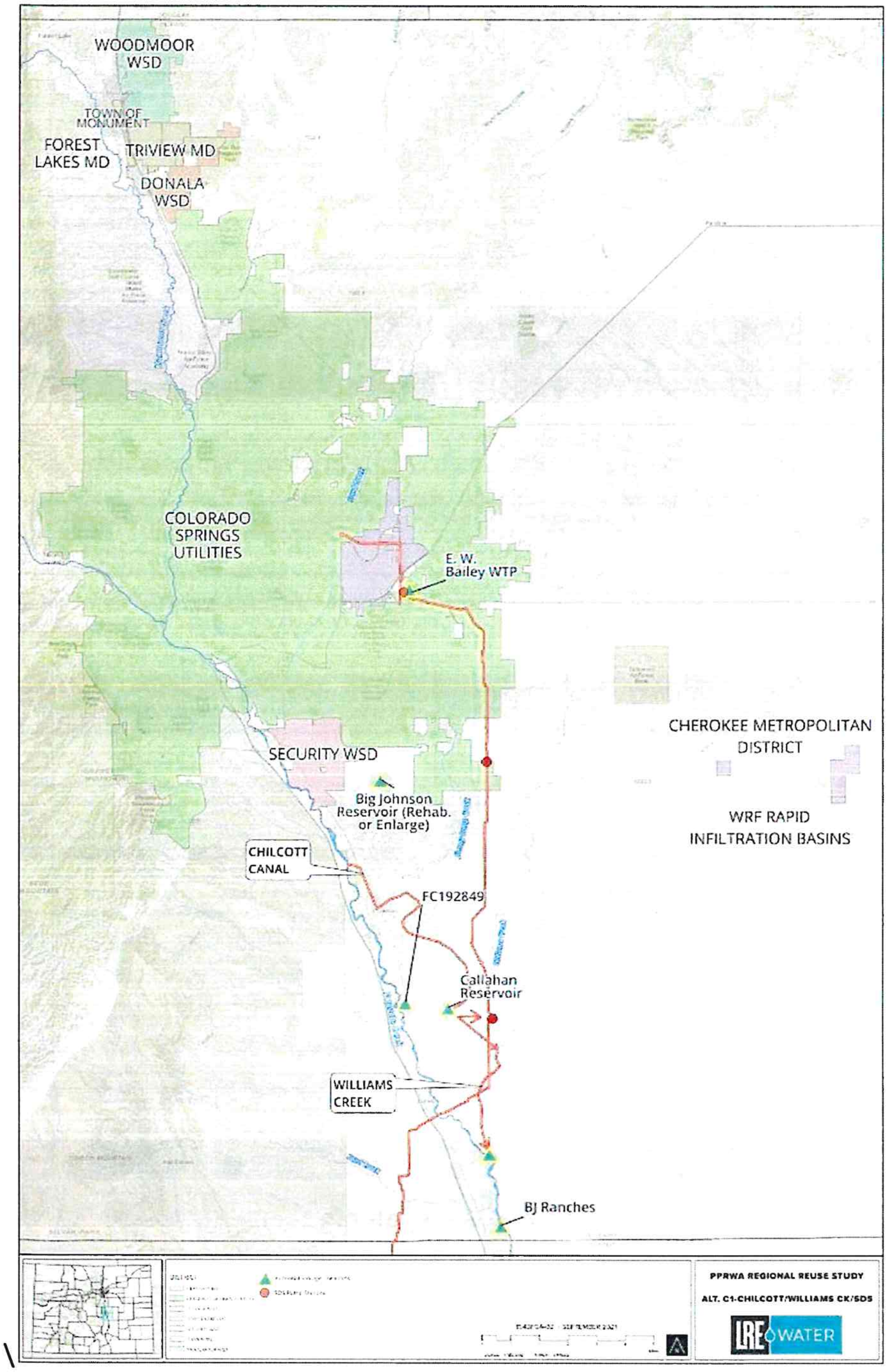


Figure 4-6: Alt C-1

Alt C-1 uses Chilcott canal to divert water from Fountain Creek to Callahan Reservoir. Water would flow past Callahan Reservoir for storage at a new Williams Creek Reservoir. The water would then be pumped to a connection with the SDS transmission pipeline.

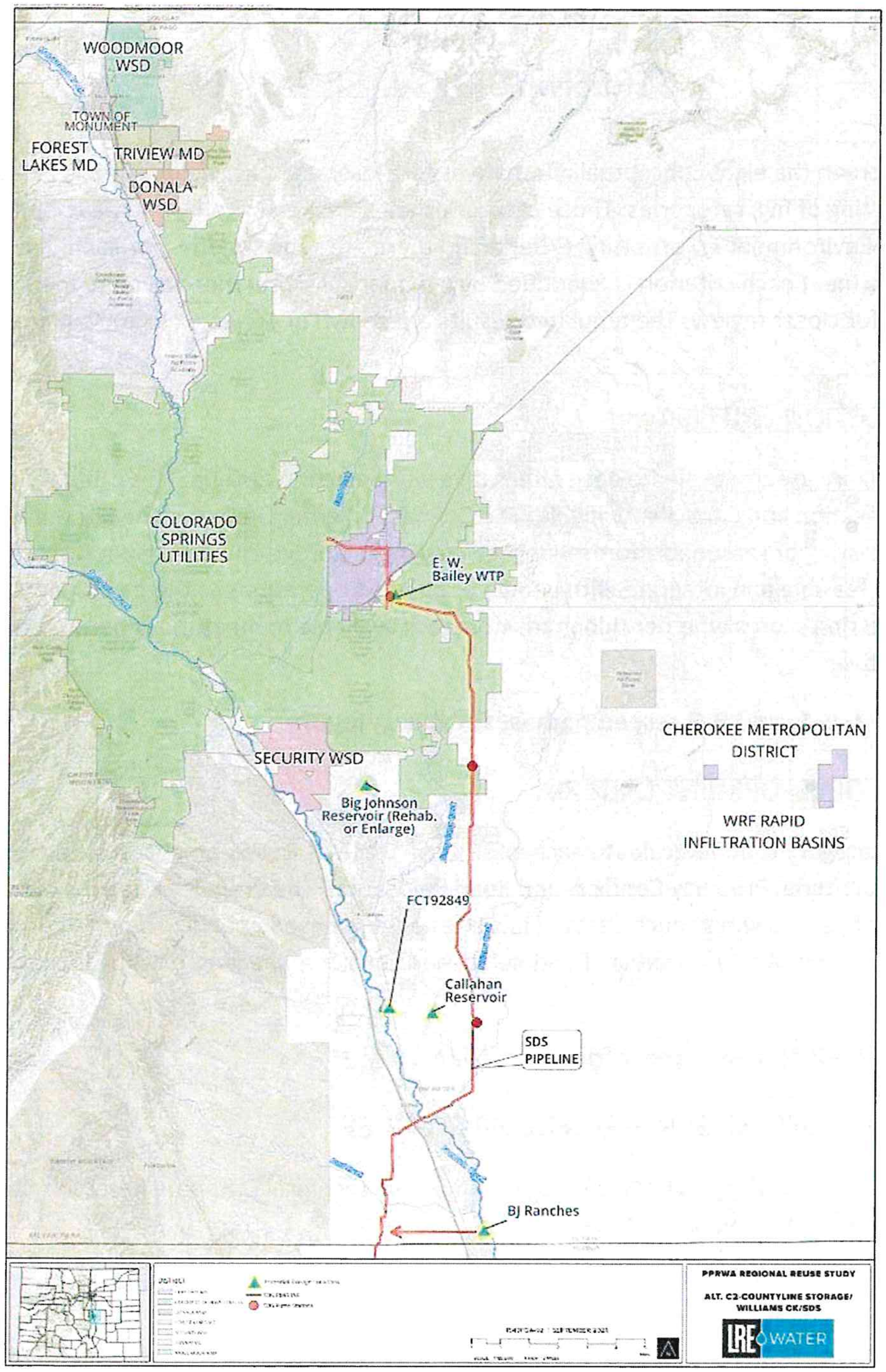


Figure 4-7: Alt C-2

Alt C-2 would include a new diversion structure and some operational storage at the BJ Ranches property located just north of the Pueblo County line. The water would be piped west to a connection with the SDS transmission pipeline.

CHAPTER 5
SCREENING OF ALTERNATIVES

In order to screen the eight conceptual alternatives for closer analysis, we developed an evaluation matrix consisting of five categories. Those categories are Selection Criteria, Site Development, Technical Criteria, and Environmental/Permitting Criteria and there are subcategories for each. The ability of each alternative to meet each criterion is quantified by a numerical score, then tallied to identify the better alternatives for closer review. The tabulated results are shown in Appendix III and summarized in this chapter.

5.1 SELECTION CRITERIA

The first category used to evaluate each alternative was Selection Criteria. This category consists of two criteria, Connection and Capacity Available. The Connection criterion scores the alternative's ability to connect to existing or reasonably foreseeable conveyance, storage and treatment facilities; it must be conceptually feasible and integrate with known or planned operations of the participants. The Capacity Available criterion scores whether minimum storage is available to meet the capacity requirements for each alternative.

Alts. A-1, A-2, B-1, and B-2 scored highest for this category.

5.2 SITE DEVELOPMENT CRITERIA

The second category used to evaluate each alternative was Site Development. This category consists of two different criteria, Property Conflicts and Road Relocation. The Property Conflicts criterion quantifies the number of parcels within each site and allocates a score based upon likelihood of property conflicts during construction of an alternative. Road Relocation considers the length of roads that would need to be relocated.

Alts. B-1 and B-2 scored highest for this category.

5.3 TECHNICAL CRITERIA – RESERVOIR STORAGE

The third category used to evaluate each alternative was Technical Criteria – Reservoir Storage. This category contains seven subcategories:

1. Return Flow Capture. This criterion considers how much of the participant return flows can be captured directly from diversion.
2. Existing or New Storage. This criterion considers whether new storage is required.
3. Average Depth. This criterion considers the average depth of the storage reservoir and its effect on potential for evaporative losses.
4. Dam Height. This criterion considers the maximum dam height needed. Higher dams are less desirable.
5. Dam Length. This criterion considers dam length, and alternatives that required longer dams are less desirable due to higher costs and permitting.

6. Site Geometry. This criterion considers site geometric efficiency. A square reservoir makes more efficient use of space than a rectangular one.
7. Drainage Basin Size. This criterion considers the drainage basin size that drains into the reservoir. A larger drainage basin is more undesirable due to an increased need to mitigate flooding with added infrastructure (such as a larger spillway).

Alts. A-1 and A-2 scored highest for this category.

5.4 TECHNICAL CRITERIA-CONVEYANCE

The fourth category used to evaluate each alternative was Technical Criteria – Conveyance. This category contains five criteria:

1. Existing or New Diversion. This criterion considers if a new diversion is required to deliver water to a reservoir.
2. Existing or New Conveyance. This criterion considered whether new conveyance is required to deliver water to the Bailey WTP.
3. Pumping to Storage. This criterion considers if pumping will be required or if gravity can convey water from Fountain Creek to the reservoir.
4. Pumping Return. This criterion considers the level of pumping required to convey water from the intake point into the reservoir.
5. Distance from Headgate. This criterion considers the distance of the reservoir from the headgate. The longer the distance from the headgate results in increased ditch losses and capacity issues.

Alts. A-1, A-2, B-1, and B-2 scored highest for this category.

5.5 ENVIRONMENTAL/PERMITTING CRITERIA

The fifth category used to evaluate each alternative was Environmental and Permitting. This category contains three criteria:

1. Environmental Permitting. This criterion considers possible environmental permitting impacts of construction of the alternative. Specifically, wetlands issues would be expected to present more difficulty in obtaining environmental permits.
2. Water Rights Issues. This criterion considers potential water rights issues with the possible need to purchase additional land for a given alternative. If the purchased land contains more senior water rights or has irrigated areas, it would be more difficult to obtain.
3. 1041 Permitting. This criterion considers the difficulty of obtaining a 1041 Permit.

Alts. A-1 and A-2 scored the highest for this category.

5.6 EVALUATION SUMMARY

The top alternatives identified were A-1 and A-2 with a tied score. Alternatives B-1 and B-2 were closely tied at the second highest score. The differentiating category among the top alternatives was Environmental/Permitting, given 1041 permitting impacts and environmental permitting. The Callahan dam would require improvements of the outlet works, while Big Johnson's dam will likely require less permitting for expansion, and its outlet was already upgraded in recent years.

Alts. B-3, B-4, C-1 and C-2 scored much lower. They would require new storage facilities further downstream than Big Johnson and Callahan Reservoirs, resulting in a more complex system with greater stream losses and requiring return flow pumping from lower elevations over greater distances. These alternatives were eliminated from further consideration.

5.7 REFINED ALTERNATIVES

Upon consideration by the project participants, the alternatives were refined for the more detailed analysis that followed. Alts. A-1 and B-1 would both require construction of a new return pipeline to the Bailey WTP, essentially paralleling the SDS transmission pipeline. But the SDS pipeline has sufficient capacity to include those return flows making Alts. A-2 and B-2 more cost effective, so Alts. A-1 and B-1 were eliminated from further consideration.

Given that the Chilcott canal is normally taken out of service during the winter, three new alternatives were added for consideration: C-3.1, C-3.2 and C-3.3. For all three, water rights flows would be conveyed by Chilcott Ditch during irrigation season, but each would have a different means for diverting and conveying year-round return flows. Alt. C-3.1 would use the reconfigured Owen & Hall diversion and pumping, C-3.2 would use the detention pond site diversion and pumping, and C-3.3 would require pumping from an alluvial well field at Fountain Creek.

It was also noted that there could be some improvement in the water quality of Fountain Creek return flows through riverbank filtration; filtering that occurs naturally in the alluvium with the use of shallow wells along the creek. That could result in added benefit for Alt. C-3.3. Similarly, an alluvial well field could be incorporated to pump return flows with the Big Johnson Reservoir option, and that became Alt. A-3. These two alluvial well field options could allow the return flows to bypass storage and some or all of the pretreatment processes for conveyance directly to one of the SDS pump stations, allowing for smaller pretreatment facilities.

We also considered three possible split combinations, Alts. D-1, D-2 and D-3 whereby the summer flows (water rights and return flows) would be conveyed by the FMIC canal for storage at Big Johnson Reservoir, and winter return flows would be conveyed from the Owen & Hall diversion (D-1), the detention pond diversion (D-2) or an alluvial well field (D-3) to Callahan Reservoir and then to the SDS Williams Creek pump station. All three were dismissed due to their complexity and the extent of infrastructure required.

CHAPTER 6
ALTERNATIVE ANALYSIS

Following reconnaissance, and identifying and screening of alternatives, this chapter documents further analysis of the six remaining alternatives listed in Table 6-1. (Please see Appendix IV for mapping and diagrams for each.) This analysis identifies the better alternatives to be considered further for implementation.

ALTERNATIVE	*DIVERSION*	*STORAGE RESERVOIR*	*SDS CONNECTION*
A-2	*FMIC Canal*	*Big Johnson*	*Bradley Pump Station*
A-3	*Water Rights-FMIC Canal; Return Flows-Alluvial Well Field*	*Big Johnson*	*Bradley Pump Station*
B-2	*Chilcott Canal*	*Callahan*	*Williams Creek Pump Station*
C-3.1	*Water Rights-Chilcott Canal; Return Flows-Owen & Hall Diversion*	*Callahan*	*Williams Creek Pump Station*
C-3.2	*Water Rights-Chilcott Canal; Return Flows-Detention Pond Diversion*	*Callahan*	*Williams Creek Pump Station*
C-4	*Water Rights-Chilcott Canal; Return Flows-Alluvial Well Field*	*Callahan*	*Williams Creek Pump Station*

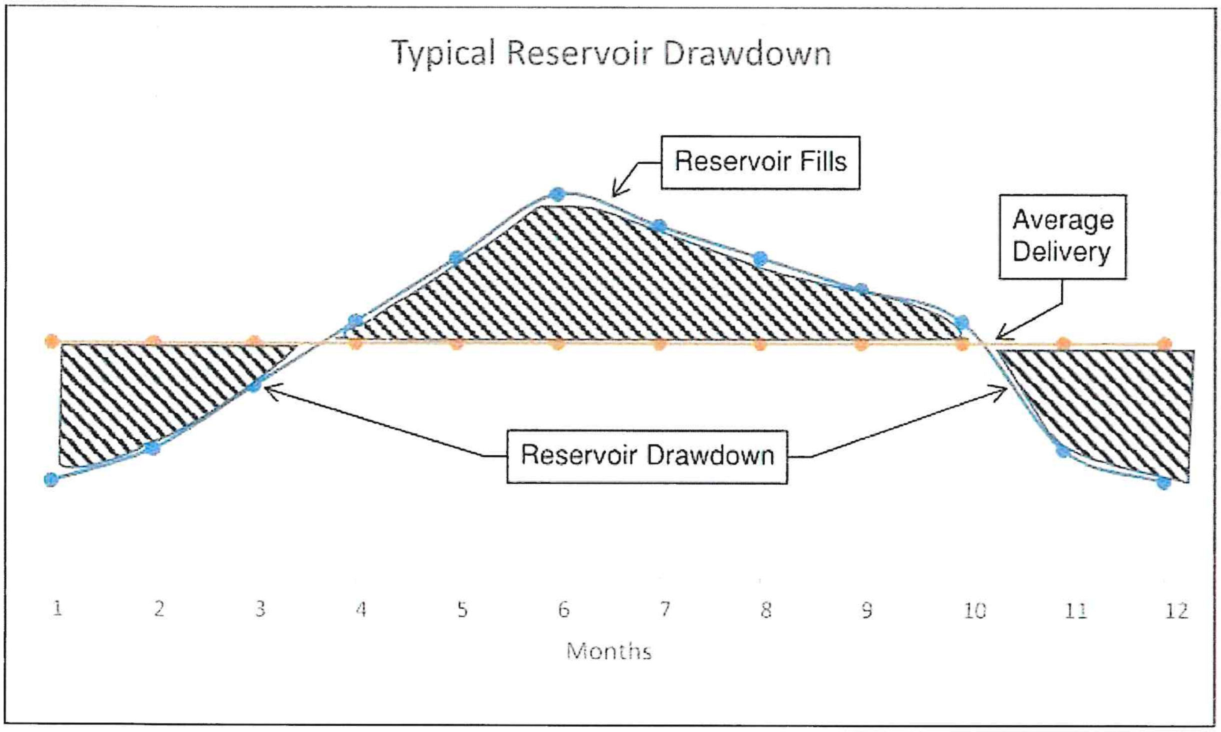
The components of each alternative are described further for comparison and contrast. First, we explain how return flows and water rights flows affect system planning differently. That leads to discussion of the diversion options, storage, treatment, and conveyance for connection to the SDS.

6.1 RETURN FLOWS VS. WATER RIGHTS FLOWS

As described in detail in Chapter 3, reuse return flows are relatively constant year-round. The return flows recaptured from Fountain Creek can then be available for use at approximately those same rates (less system losses) in respective participant water systems. Water rights diversions, however, occur primarily during the irrigation season.

An underlying condition of this study is that deliveries to suburban water providers must be at relatively constant rates year-round so as not to require Springs Utilities to reserve system capacity to deliver peak demands to those providers. Water storage is needed to dampen the water rights flows such that they fill the reservoirs during the irrigation season (when diversions exceed deliveries) and draw down the rest of the year (when deliveries exceed diversions). The reservoir would operate to discharge those flows at a fairly constant rate year-round as illustrated by Figure 6-1.

Figure 6-1: Typical Reservoir Drawdown



6.2 DIVERSION OPTIONS

All of the remaining alternatives use existing diversions and conveyances for at least a portion of their flows. Alts. A-2 and A-3 use the FMIC canal, and the others use the Chilcott canal.

6.2.1 FMIC CANAL

The FMIC canal would be used for Alts. A-2 and A-3. Interestingly, three participants in this study are members of FMIC and comprise a majority interest; TMD, Springs Utilities and SWSD. The FMIC canal is approximately 9.5 miles long from the headgate to Big Johnson Reservoir. Flow is currently restricted to 15-20 cfs in the upper portion of the canal, from the headgate to the Spring Creek augmentation station/turnout (approximately 3300 feet). Below that point, the canal has capacity to deliver at least 20 cfs to the reservoir and its capacity could be increased through ditch lining. Ditch losses from the headgate to the reservoir are estimated at 10 percent.

6.2.2 CHILCOTT CANAL

The Chilcott canal would be used for Alts. B-2, C-3.1, C-3.2 and C-4. WWSD has an ownership interest in this canal. It is slightly longer than the FMIC canal at 9.6 miles. The Chilcott canal is expected to have ample capacity available for purposes of this study, and it could also be improved in areas. Although actual losses are comparable to those of the FMIC canal, Chilcott requires that conveyance agreements account for a 15 percent loss in their accounting for delivery to Callahan Reservoir.

6.2.3 NEW/MODIFIED DIVERSIONS

Three alternatives would add a second means of diverting/conveying to (or bypassing) Callahan Reservoir for only the return flows, in addition to conveying the water rights flows in the Chilcott canal. All three would have minimal losses due to piping conveyance vs. ditches.

Alt. C-3.1 would require modifications to the existing Owen & Hall diversion structure with pumping and piping to the reservoir. Alt. C-3.2 would require acquisition of the detention pond property, along with approval and construction of a new diversion structure with pumping and piping to the reservoir. Alt. C-4 would require property acquisition and construction of an alluvial well field to pump directly to the SDS Williams Creek pump station (assuming that riverbank filtration would counter the need for pretreatment).

6.3 WATER STORAGE OPTIONS

An analysis of water rights flows vs. storage capacity indicates that 1,500 to 1,600 AF of capacity would be needed in either Big Johnson Reservoir or Callahan Reservoir to optimize year-round use of 4,670 AFY in water rights (see Chapter 3) owned by the participants in this study. Differences in how the two reservoirs are operated point to very different expansion requirements to accommodate the water rights flows considered in this study.

Because reuse flows will be diverted and returned also at fairly constant rates year-round, no storage is theoretically needed to facilitate regional reuse. The return flows diverted from lower Fountain Creek can be delivered to the entities at those same constant rates (not accounting for system losses). Some storage may be needed only to maintain operations in the event of a water transmission line break, pump station failure or some other system upset. The storage to be provided to accommodate the water rights can also function as operational storage for this purpose.

6.3.1 BIG JOHNSON RESERVOIR

Big Johnson Reservoir fills for "winter storage" throughout the non-irrigation season, typically reaching its highest level in March each year. The reservoir is then drawn down to accommodate irrigation usage throughout the summer. Because those current uses are "out of phase" with storage needs for the participants' water rights, a large share of existing storage capacity could also accommodate those water rights. If so, a nominal expansion of 500 AF could be sufficient.

6.3.2 CALLAHAN RESERVOIR

Callahan Reservoir on the other hand, is operated for summer storage, filling seasonally at the same time as needed for diversion of the participants' water rights. Therefore, Callahan's existing capacity is not available to accommodate those water rights and an expansion of 1,500 to 1,600 AF would be required.

6.4 WATER TREATMENT

The extent and capacity of water treatment required for each of the alternatives are significant factors in comparing the capital, operation and maintenance costs. For all alternatives, the water would be conveyed to Springs Utilities' SDS-Bailey Water Treatment Plant (BWTP) prior to distribution to participant systems. It will likely be more cost effective for all participants to consolidate treatment for the Fountain Creek return flows/water rights at the BWTP, but more water quality information is needed to determine what additional treatment processes or plant modifications would be needed.

Otherwise, some level of pretreatment for the Fountain Creek water could be required to make it more compatible with SDS water quality originating in Pueblo Reservoir. Additionally, water from alluvial wells along Fountain Creek would benefit from riverbank filtration, resulting in better quality water compared to surface flows diverted from the creek. If pretreatment is required for Fountain Creek water, some or all pretreatment processes could be bypassed for the supply portion drawn from alluvial wells.

CHAPTER 7
COST COMPARISONS

This chapter provides further screening of the six remaining alternatives listed below for closer analysis and recommendations. The alternatives are compared on the bases of capital costs, operation and maintenance costs, total present worth and net production after water losses.

- Alt. A-2: FMIC Canal to Big Johnson Reservoir to SDS-Bradley Pump Station
- Alt. A-3: Similar to Alt. A-2 but includes alluvial wells pumping return flows to bypass Big Johnson Reservoir
- Alt. B-2: Chilcott Ditch to Callahan Reservoir to SDS-Williams Creek Pump Station
- Alt. C-3.1: Owen & Hall diversion to Callahan Reservoir to SDS-Williams Creek Pump Station
- Alt. C-3.2: Detention pond diversion to Callahan Reservoir to SDS-Williams Creek Pump Station
- Alt. C4: Similar to Alt. B-2 but includes alluvial wells pumping return flows to bypass Callahan Reservoir

Capital cost opinions, annual operations and maintenance costs, and total present worth in 2022 dollars to build, operate and maintain the alternative systems for 20 years are shown in the tables that follow. Table 7-1 shows the costs if no pretreatment is required and all treatment is provided at the BWTP. Table 7-2 that follows shows the costs if pretreatment is necessary prior to combining the Fountain Creek return/water rights flows with SDS sourced water.

Table 7-1: Alternative Costs Without Pretreatment

ALTERNATIVE	CAPITAL COST	ANNUAL O&M	TOTAL PRESENT WORTH
ALT A-2	$19.3-23.3M	$0.25M	$27.4-31.4M
ALT A-3	$26.0-30.0M	$0.44M	$37.6-41.6M
ALT B-2	$19.7-31.9M	$0.10M	$24.3-36.5M
ALT C-3.1	$27.2-39.3M	$0.16M	$33.5-45.6M
ALT C-3.2	$25.4-37.6M	$0.16M	$31.8-44.0M
ALT C-4	$29.5-41.6M	$0.25M	$37.4-49.5M

Table 7-2: Alternative Costs With Pretreatment

ALTERNATIVE	CAPITAL COST	ANNUAL O&M	TOTAL PRESENT WORTH
ALT A-2	$61.5-65.6M	$1.50M	$85.6-89.6M
ALT A-3	$46.0-50.1M	$1.44M	$69.7-73.6M
ALT B-2	$68.5-80.7M	$1.31M	$88.0-100.2M
ALT C-3.1	$77.5-89.7M	$1.38M	$98.4-110.2M
ALT C-3.2	$75.9-88.1M	$1.37M	$96.4-108.5M
ALT C-4	$56.1-68.3M	$1.25M	$74.7-86.8M

7.1 CAPITAL COSTS

Alts. A-2 and A-3 using the FMIC canal and Big Johnson Reservoir (with A-3 also including alluvial wells) mirror Alts. B-2 and C-4 using Chilcott canal and Callahan Reservoir (with C-4 including alluvial wells), but are expected to have lower capital costs. Because the return and water rights flows of this Study require storage off peak from current storage requirements in Big Johnson Reservoir, the reservoir need only be expanded by up to 500 AF. Current storage in Callahan Reservoir matches the seasonal needs of the flows of this study and would require expansion by more than 1,500 AF.

Alts. C-3.1 and C-3.2, the alternatives adding new or modified diversions for piping and pumping surface flows to Callahan Reservoir, would be more costly than Alt. B-2 because of the additional infrastructure needed vs. conveying flows to Callahan Reservoir via the existing Chilcott canal.

7.2 O&M COSTS

Intuitively, O&M costs for the Callahan Reservoir alternatives would be higher than for the Big Johnson Reservoir alternatives because Callahan is approximately 240 ft lower in elevation and 9 miles further downstream, requiring more pumping energy to convey the return/water rights flows to the BWTP. That pumping component is not included in this evaluation however, as it would be added to Springs Utilities operations and this Study only identifies the costs to convey the water to a point of connection to the SDS. The O&M costs shown in the tables are based on pumping flows 4.3 miles from Big Johnson Reservoir to the SDS-Bradley Pump Station vs. only 1.1 miles from Callahan Reservoir to the SDS-Williams Creek Pump Station.

7.3 TOTAL PRESENT WORTH COSTS

The total present worth costs, the funds needed in 2022 dollars to build, operate and maintain the system for 20 years, are generally lower for the FMIC canal-Big Johnson Reservoir alternatives (A-2 and A-3) than the Chilcott canal-Callahan Reservoir alternatives (B-2 and C-4). With no pretreatment required, Alt. A-2 using only FMIC canal to convey flow to Big Johnson Reservoir is more cost-effective than adding an alluvial well field for conveyance of return flows bypassing the reservoir. If pretreatment is required, the improved water quality from alluvial wells results in lower costs of treatment, offsetting the added costs of the alluvial well field and conveyance piping/pumping.

7.4 NET PRODUCTION

It is also helpful to consider the widely varying water losses of the six remaining alternatives in addition to the cost analyses. The alternatives generally have a mix of Fountain Creek transit losses, ditch losses, reservoir evaporative losses, and treatment losses. Overlaying the cost analyses with the net production after deducting the losses of each alternative, the median cost per AF delivered is determined as shown in Table 7-3 and 7-4.

Table 7-3: Alternative Costs without Pretreatment

ALTERNATIVE	AVERAGE YIELD (AFY)	TOTAL PRESENT WORTH	COST PER AFY DELIVERED
ALT A-2	**10,520**	**$27.4-31.4M**	**$2,790**
ALT A-3	**11,660**	**$37.6-41.6M**	**$3,400**
ALT B-2	**9,550**	**$24.3-36.5M**	**$3,180**
ALT C-3.1	**10,040**	**$33.5-45.6M**	**$3,940**
ALT C-3.2	**10,040**	**$31.8-44.0M**	**$3,770**
ALT C-4	**11,310**	**$37.4-49.5M**	**$3,840**

Table 7-4: Alternative Delivery Costs with Pretreatment

ALTERNATIVE	AVERAGE YIELD (AFY)	TOTAL PRESENT WORTH	COST PER AFY DELIVERED
ALT A-2	10,520	$85.6-89.6M	$8,330
ALT A-3	11,660	$69.7-73.6M	$6,140
ALT B-2	9,550	$88.0-100.2M	$9,850
ALT C-3.1	10,040	$98.4-110.2M	$10,390
ALT C-3.2	10,040	$96.4-108.5M	$10,200
ALT C-4	11,310	$74.7-86.8M	$7,140

7.5 RECOMMENDED ALTERNATIVES

When considering the yield and costs for each alternative, Alt A-2 is the lowest cost at $2,790 per AFY delivered if no pretreatment is required. Alt A-3 is the lowest cost at $6,140 per AFY delivered if pretreatment is required.

It is recommended that capacity in the FMIC Canal be used to convey flows for storage in an expanded Big Johnson Reservoir, then on to the SDS-Bradley Pump Station. If pretreatment is found to be necessary, an alluvial well field on Fountain Creek should be evaluated for conveying reuse return flows bypassing treatment of water rights flows from reservoir storage.

CHAPTER 8
IMPLEMENTING THE PLAN

A regional water reuse system as described in this study is feasible and could prove to be very cost effective to implement, once all costs are identified. Each participant can benefit from the "savings of scale" that a single regional system offers vs. having each entity independently develop their own system. The regional system could also provide the means for delivery of current and future water rights available from Fountain Creek.

Costs need to be confirmed (or identified) for three critical topics before the full financial picture can be known. Specifically, those areas are: (1) FMIC/Big Johnson Reservoir; (2) pretreatment vs. treatment consolidation at the Bailey WTP; and (3) Springs Utilities charges for treatment/delivery. Each is described further below.

8.1 FMIC/BIG JOHNSON RESERVOIR

As developed through this study, the alternatives making use of the FMIC canal and expanded storage in Big Johnson Reservoir are the more cost-effective options. The participants should open discussions with the rest of the FMIC ownership to explore the possibilities of how they can mutually benefit from shared use of the FMIC facilities as a key part of the regional reuse system. Sizing the possible reservoir expansion will need to be considered for joint operation of current needs with those of the study participants.

8.2 TREATMENT

It will likely be more cost effective to consolidate treatment of Fountain Creek water at the SDS-Bailey WTP rather than provide some level of pretreatment at a separate facility. To confirm, Springs Utilities will need to determine what (if any) treatment modifications would be needed at Bailey and what operational costs could be incurred.

That analysis will depend on a comparing water quality for the Fountain Creek return flows to that of the SDS raw water quality that Bailey currently treats, including seasonal variations. Additional sampling over some extended period of time may be required. Tables showing the water quality constituents currently sampled for both supplies are shown in Appendix V. If all treatment is to be provided at the Bailey WTP, Alt. A-2 would be the more cost-effective plan for the regional reuse system (vs. Alt. A-3 with an alluvial well field) as noted in Chapter 6.

8.3 SPRINGS UTILITIES

Moreover, Springs Utilities will need to charge each of the other participants for their respective share of finished water treatment and delivery costs to points of connection to those other water systems. Those cost shares will need to be factored into the overall cost determination for each participant.

8.4 OTHER CONSIDERATIONS

Two other considerations are noted as the participants move toward performing their "due diligence" with regard to a regional system: point of diversion and storage need. With regard to point of diversion, it is assumed for this study that the participants can legally obtain their return flows at the FMIC headgate (or from an alluvial well field in the area). It is assumed that the water rights flows can also be obtained at the headgate or could be transferred to that point of diversion. Each participant will need to review their water rights decrees and discuss with their water attorney to confirm.

Although allocation of costs is beyond the purposes of this study, it is helpful to again note that expanding reservoir storage would primarily accommodate the water rights flows. Some operational storage is helpful to manage return flows, but existing storage capacity in Big Johnson Reservoir could reasonably fulfill that need. Therefore, reservoir expansion costs would be funded primarily by those participants drawing water rights from Fountain Creek in excess of their return flows.

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APPENDIX II: INTERVIEW SUMMARIES

Below are the summaries of interviews conducted with each participating entity to this study.

Cherokee Metropolitan District

Cherokee Metropolitan District (Cherokee) is generally sufficient in its current supply portfolio and is working toward decreasing its reliance on Denver Basin groundwater through ongoing development of its reuse system in the Upper Black Squirrel Creek Designated Groundwater Basin (UBSCDGB). The sustainability of its water rights and well systems will be greatly enhanced with the approval of a Replacement Plan to the UBSCDGB. At the same time, Cherokee is interested in acquiring renewable surface water supplies that might further enhance its supply portfolio and could also be used for replacement to the UBSCDGB. Cherokee has an extensive water infrastructure system for both raw and treated water that may useful in a regional context.

Colorado Springs Utilities

Colorado Springs Utilities (CSU) is the County's largest water and wastewater service provider and serves as a central hub for the region. It is participating in this study because it may be able to optimize use of its infrastructure and improve efficiencies through regional cooperation. In recent years, CSU has considered related policy direction in the following areas:

- Regional collaboration without impairing the ability to serve existing customers;
- Leadership in regional water reuse of existing supplies;
- Ways to identify economies of scale and potential for efficiencies including use of the JD Philips Wastewater Recovery Facility (JDP), and development of the North Monument Creek interceptor (NMCI) in connection with the USAFA visitor center.

From the Water Services perspective, CSU is looking for the ability to craft contracts and water services without compromising collaborative storage and use by multiple entities. It is interested in pursuing a greater regional leadership role, and collaboratively using existing systems. CSU prefers to work with regional entities and get away from 'one off' or custom arrangements with multiple partners.

Additionally, CSU is developing a new Nonpotable Water Resource Plan with a goal of increasing nonpotable water use by 1,250 – 1,500 AF/yr., and perhaps as much as 2,500 AF/yr. They have an approved regional services plan, and will close the coal-fired Drake Power Plant in 2023 and the Nixon Power Plant in 2030. Both plants use wet cooling technologies they are currently the largest nonpotable water customers. CSU is also pursuing an Indirect Potable Reuse (IPR) demonstration project that dovetails with the NMCI and regionalization, and mitigates against limited exchange potential. Related to the IPR demonstration project, CSU is building a mobile direct potable reuse (DPR) unit with Colorado School of Mines using donated equipment and in-kind services. The unit will connect at JDP for direct reuse as a demonstration and proof of concept to gauge public support.

Utilities did not participate in the *PPRWA Regional Infrastructure Study*, but did participate in the *EPC Water Master Plan* and has completed numerous other studies including the IWRP. Their regional technical study is the most significant recent development Going forward in CSU's master planning, there will be a greater focus on anticipated growth in and out of the current service area where there may be opportunities to annex and coordinate with existing infrastructure. Their new Nonpotable Water Resource Plan can dovetail with the PPRWA Regional Reuse Study as both are on the same timeline for completion in 2021.

CSU's most significant challenges with respect to indirect or direct reuse of return flows are:

- Public acceptance;
- Recapture, storage and delivery mechanisms;
- Difficulty coordinating with a large group with different goals and objectives while trying to move in the same direction; and
- Administration and accounting of return flows is not merely a mathematical or engineering challenge, but also has political and socioeconomic implications.

With respect to demand growth, CSU's trajectory is tracking with the medium path identified in the IWRP with more indoor than outdoor use, resulting in a higher percentage of sewered return flows from the same demand level; a ratio of approximately 60/40 indoor/outdoor. Consumptive use is 43% over a 10-year average with 57% return flow system-wide.

CSU has numerous legal challenges associated with regionalization and reuse including the Pueblo County 1041 permit for SDS, not violating existing agreements, and non-injury to existing water rights. For example, CSU cannot deliver water outside of the Arkansas River basin. They need a lot of storage for different purposes including Restoration of Yield (ROY) storage pertaining to the Pueblo Management Program. High-level internal studies on sizes completed or underway, but not reviewed or published.

CSU recognizes that there may be better site options for the Williams Creek Reservoir as conceived in the 1990s during SDS permitting, but will maintain its interest in the selected site until a better alternative is proven. It may be best implemented in combination with storage elsewhere.

Donala Water and Sanitation District

Donala Water and Sanitation District (Donala) is a member of, and operates the Upper Monument Creek Regional Wastewater Treatment Facility. Its blended Denver Basin groundwater and transferred agricultural water supplies generate reusable return flows that accrue to Monument Creek and are either leased to downstream users or combine with native Fountain Creek and Arkansas River water uncredited to reuse by Donala. First use of its transferred surface water rights derived from lands in Lake County accrue to Pueblo Reservoir stored under a long-term Excess Capacity contract, and the water is subsequently conveyed, treated, and delivered through an arrangement with CSU using the SDS and an interconnect with CSU's treated water distribution system. Donala also owns Laughlin Ditch water that is currently unchanged for use in its service territory, but will also generate reusable return flows available for recovery. Donala continues to look for opportunities to acquire more renewable surface water supplies to decrease its reliance on nonrenewable groundwater adding redundancy and resilience to its supply portfolio.

In the context of this study, Donala is interested in identifying regional collaborative opportunities to recapture its reusable return flows for the sources described above.

Forest Lakes Metropolitan District

Forest Lakes is participating in this study due to noticeable changes in its lake volume. In 2020, the District's lake dropped about eight feet and if this continued, it could become a serious problem. The District has adequate water supplies; however, some of the water is tied up by developers. Reuse had not previously been considered as an option or pursued by the District. This year, 2021, the lake water level has been rising.

Currently, all water the District uses is reusable to extinction. The water rights were bought from CSU, and the only restriction is that the water must be used in Forest Lakes.

The District has not participated in a reuse study before, although some prior studies pointed to possible use of their reservoir as part of a reuse system. They also did not participate in the *PPRWA Regional Infrastructure Study*, but did participate in the *El Paso County Water Master Plan*. With respect to regional partnerships, the Northern Delivery System makes a lot of sense for the District.

Significant challenges for Forest Lakes are directly related to the water source and water quality. Forest Lakes must receive treated water as part of the reuse system. They are unable to receive raw water since this could create additional treatment and storage expenses.

Forest Lakes' build-out was expected to occur in 2024-2025 for residential sites; however, they now anticipate a slower trajectory. Currently, there are 262 taps connected, and the District expects to have 505 taps connected at buildout. Commercial sites are expected to be built out before the residential sites. There is currently one commercial tract that is 250 acres. Another commercial tract south of Baptist is accelerating and some services have already been extended. Sixty lots south of Bristlecone may go into a conservation easement.

Surface and groundwater rights are all held by a combination of developers and the District, however, the District has the power to move and/or change all water rights. With respect to water rights changes, Forest Lakes deeded all of the groundwater, but retained approximately 300 AF. They have also executed a warrant deed for 137 AF each in the Denver and Laramie Fox Hills aquifers.

Forest Lakes has a 1.5 MG storage tank for treated water in Bristlecone, of which 0.5 MG is licensed to Monument. There is another smaller tank on the west end. The district also has 1520 AF of raw water storage.

Town of Monument

Monument depends heavily on Denver Basin and wants to reduce the draw on its wells by making use of its reusable return flows. Participating in this study will help them figure out the most viable way to get return flows back, whether it is through a regional system or a more localized return as studied with Woodmoor WSD a few years back. If a regional system is favorable, they must consider whether it is connected to the CSU system or is an alternative possibly using Cherokee's Sundance pipeline. Capital, operational, maintenance, and carrying costs may be acceptable with enough regional partners, but that needs to be evaluated. A flow-based allocation is preferred for infrastructure costs because the Town's demands are relatively small vs. those of some neighboring districts.

Demand is growing at 5% per year, but return flows are growing at 3% per year. Monument's demand growth is most likely to accelerate over past forecasts, and it may build out to 910 AF in as little as 10 years based on recent projections. In addition, much has changed since the Town's 2014 Water Master Plan—some projects have been completed and some developments delayed. The Town has no plans to buy additional water rights at this point, but regularly looks at such opportunities.

With respect to water quality, the long-distance delivery for a regional system may dissipate chlorine and introduce disinfection byproduct concerns. Raw water could be a bigger challenge—would either need to be treated at a new Monument water plant or regional Monument-area plant. If participating in a regional system, Monument may need terminal storage to help with meeting seasonal demands. It may also be worth reconsidering ASR.

Security Water and Sanitation District

Security Water and Sanitation District (SWSD) is a participant of the FVA and SDS systems, which puts SWSD in a good position with respect to water resources. They have some return flows accessible on Fountain Creek based on treated effluent credits and fully consumable water rights. SWSD is interested in being a part of this study to help the region succeed and seek out opportunities to work with the northern entities. SWSD is also interested in this study as a potential backup plan for water resources.

New water right acquisitions have occurred since the *PPRWA Regional Infrastructure Study* and the *El Paso County Water Master Plan*. SWSD recently completed an update to their Water Resource Report. SWSD also bought a ranch in Coaldale, on the Arkansas River. The property is a total of 200 acres and the water right is 200 AFY, which will be delivered via the FVA system. SWSD is also a SuperDitch participant and continues to look for more water rights on the Arkansas to have more resilient supplies in case of a possible Fry-Ark Project call out in the Colorado River Basin. They hold many of the FMIC shares and can use return flows for well augmentation.

CWPDA leases SWSD's return flows to farmers that allows SWSD to have 75% of that volume in Pueblo Reservoir. The trade can be 1:1 during the summer; however, there have been some changing conditions with CWPDA and the farmers. This is one of the challenges that SWSD currently faces.

SWSD is 80% built out and expects to reach full buildout by 2035. Development has leveled off, however and there is little activity.

The District does not foresee drastic challenges with the water quality from the potential new sources; however, they are aware that some type of treatment will be required. SWSD is also interested in lead and copper thus, enhanced lead and copper sampling is necessary when switching between water supplies.

Triview Metropolitan District

Triview's status is well stated in the background section of its draft Environmental Assessment in pursuit of a long-term Excess Capacity contract in Pueblo Reservoir:

Triview owns and maintains facilities that provide water, wastewater, and stormwater services to a 2,590-acre service area within the Town of Monument. Currently, this includes more than 1,900 homes and 60 commercial customers. Triview's service area is located entirely within the Arkansas River Basin. Historically, Triview's water supply has been derived from nonrenewable deep aquifers in the Denver Basin, which are being depleted and are not a sustainable resource in the long-term. In recent years, Triview has been actively acquiring renewable sources to supplement its Denver Basin groundwater, and the resources to convey such renewable resources to Triview:

- Decreed Denver Basin groundwater, representing 3,722.4 acre-feet (AF) of deliverable yield;
- 1,057 shares of the FMIC, representing an average annual yield of approximately 739.9 AF;
    - Access to water storage in Big Johnson Reservoir through its ownership of 1,057 shares of the FMIC.
- Approximately 50% share of Excelsior, representing an average annual yield of approximately 720.8 AF;
- Ownership of 2,050 AF of conditional water storage rights in the Stonewall Springs Reservoir Complex (SSRC) as filled with the Excelsior Ditch, and 19,538 shares in the Stonewall Springs Reservoir Company (SSRCo), representing approximately 19,538 AF of conditional storage capacity;
- Ownership of the AVIC representing an average annual yield of approximately 439.8 AF;
- Ownership of the Bale Ditch No.1 and 50% of the Bale Ditch No. 2 representing approximately 82.0 AF.

All of the average annual yields of historical consumptive use water from the above sources can be used and reused to extinction in accordance with their existing or anticipated decrees under Colorado water law. These water rights vary seasonally and inter-annually and the return flows resulting from Denver Basin groundwater use accrue to the Fountain Creek watershed on a continuous basis. Additional storage is needed to manage that variability and to recapture the reusable return flows resulting from their first use. Triview is requesting a contract to store up to 999 AF in Pueblo Reservoir if and when space is available for municipal purposes within Triview's service area. This contract will not be used to expand the district's service area, but instead will be used to support Triview's efforts to replace its non-renewable Denver Basin groundwater supplies with renewable surface water supplies.

In the context of this study, Triview is interested in identifying regional collaborative opportunities to recapture its reusable return flows for the sources described above that are potentially more efficient, less risky, and more cost-effective than exchanging its return flows into Pueblo Reservoir or capturing them at the Excelsior Ditch on the Arkansas River.

Woodmoor Water and Sanitation District (WWSD)

Woodmoor would like to explore the costs and alternatives associated with regional storage of recaptured reusable return flows, and the potential to capture additional water rights in the future. Knowing the Northern Monument Creek Interceptor (NMCI) Project will move return flows to the J.D. Phillips Water Resource Recovery Facility outfall, it may be cost-effective to return these flows to WWSD facilities to meet current and future potable demands. If not, WWSD may opt for a localized reuse system previously studied with the Town of Monument.

CSU's and other entities' willingness to explore regional water use and recapture of reusable return flows has been a significant change since previous studies were performed. The costs that CSU will charge to convey, treat, and deliver water are a significant factor in whether the larger regional system can be cost effective.

WWSD must also consider how best to deliver the water rights they own at JV Ranch, south of Colorado Springs. The estimated annual consumptive use volume assumption of JV Ranch in normal years is approximately 3,500 AFY; 4,500 AFY in wet years and 2,500 AFY in dry years.

Public perception is one of the largest challenges WWSD faces in the use of direct and indirect return flows, with indirect being the less challenging of the two. In addition, under the NMCI plan, moving WWSD's return flow from the Tri-Lakes WWTF discharge site to the J.D. Phillips site could result in injury to intervening water rights holders.

Current information indicates that the District is growing at a higher than median growth rate. Tracking also indicates that this growth rate will continue for the next five to seven years. Buildout to 6557 SFEs within current boundaries is expected to occur by 2035. However, the boundaries could be expanded, increasing buildout to 7801 SFEs.

Concerns with respect to water quality have to do with blending different waters; this goes for both potable and raw water sources. Water quality has been a topic of discussion and concern that needs further evaluation once sources are known. The possible options include blending potable water from CSU's system into Woodmoor's system and blending raw water returns from Fountain Creek into CSU's SDS system. Woodmoor expects this study to identify whether any pre-treatment will be necessary for blending reuse water with CSU's raw water supplies prior to potable treatment.

Woodmoor has surface water storage of approximately 600 AF in Lake Woodmoor. However, to store all of Woodmoor's water rights so that conveyance capacities remain manageable, Woodmoor would need approximately 2,000 AF of storage.

Woodmoor has the Monument Creek Exchange System, a reuse system. The system works by exchanging reusable wastewater return flows upstream for diversions and storage in Lake Woodmoor. Woodmoor knows that this system is not 100% efficient partly due to stream flow limitations throughout the year. Historical exchange and diversion rates have indicated that Woodmoor's exchange is approximately 42% efficient, meaning that Woodmoor captures and reuses 42% of its treated wastewater flow on average. Woodmoor has also explored constructing an advanced water treatment plant at the wastewater facility, referred to as their localized IPR option. This WTP would increase Woodmoor's reuse system efficiency to near 95%. This option is feasible and would yield the largest quantity of reusable water on a net basis, meaning there would be little to no transit losses associated with conveyance down Monument and Fountain Creeks prior to recapture.

Woodmoor has considered different alternatives with respect to reuse and storage. Aside from constructing its own infrastructure, two other alternatives could be cost-effective for reuse and to facilitate use of the District's JV Ranch surface water. One would be to contract with CSU to convey, treat, and deliver the District's surface water. The other would be to collaborate with a larger group to construct the infrastructure that was outlined in the *PPRWA Regional Infrastructure Study* that would exclude CSU. Woodmoor expects a thorough economic analysis comparing capital and O&M costs for both options to identify which is better. Both options require constructing storage infrastructure and conveyance systems that will require long-term O&M and/or service costs.

Woodmoor anticipates that the Northern Delivery System will provide average annual flow and Woodmoor will use the water directly to meet high demands from June through September, but October to May deliveries could be dechlorinated and stored in Woodmoor Lake. That water could then be re-treated and used seasonally to help meet high demands.

APPENDIX III: CHAPTER 5 TABLES

Table 5-1: Selection Criteria

		Alternatives						
		AltA1	AltA2	AltB1	AltB2	AltB3	AltC1	AltC2
Criteria	Discussion	Points						
Category 2: Site Development Criteria								
Property Conflicts	This criterion considers number of parcels within each site. A higher number of parcels within a given site increases the likelihood of potential property acquisition issues.	0	0	1	1	0	0	0
Road Relocation	This criterion considers the length of county roads that would need to be relocated. Relocating county roads is not desirable because of costs, public involvement, and permitting.	1	1	1	1	1	1	1
SUBTOTAL	**Max Possible Value = 2**	**1.0**	**1.0**	**2.0**	**2.0**	**1.0**	**1.0**	**1.0**

Table 5-2: Site Development Criteria

		Alternatives						
		AltA1	AltA2	AltB1	AltB2	AltB3	AltC1	AltC2
Criteria	Discussion	Points						
Category 1: Selection Criteria								
Connection	Connections to existing or reasonably foreseeable conveyance, storage, and treatment facilities must be conceptually feasible and integrate with the known or planned operations of the participants.	1	1	1	1	0	0	0
Capacity Available	Min. Storage available?	1	1	1	1	1	1	1
SUBTOTAL	**Max Possible Value = 2**	**2.0**	**2.0**	**2.0**	**2.0**	**1.0**	**1.0**	**1.0**

Table 5-3: Technical Criteria – Reservoir Storage

		Alternatives						
		AltA1	AltA2	AltB1	AltB2	AltB3	AltC1	AltC2
Criteria	Discussion	Points						
Category 3: Technical Criteria - Reservoir Storage								
Return Flow Capture	This criterion considers how much of the participant return flows can be captured directly from diversion.	0.5	0.5	0.5	0.5	0.5	0.5	1
Existing or New Storage	This criterion considers whether new storage is necessary and whether rehabilitation or enlargement is necessary for existing storage.	1	1	0.5	0.5	0.5	0	0
Avg. Depth	This criterion considers avg. depth and its effect on potential for evaporative losses.	0	0	1	1	1	0	0
Dam Height	This criterion considers the maximum dam height. Taller dams are undesirable because of cost and permitting requirements.	1	1	1	1	1	1	1
Dam Length	This criterion considers the maximum dam length. Longer dams are undesirable because of cost and permitting requirements.	1	1	0	0	0	0.5	0.5
Site Geometry	This criterion considers the site geometry efficiency. A square site is desirable because it would be more efficient (i.e., less perimeter length - embankment, barrier wall, etc..) than a long, narrow site of the same size.	0	0	1	1	1	0.5	0.5
Drainage Basin Size	This criterion considers the drainage basin size that discharges to the reservoir. A larger drainage basin is undesirable because it may require a spillway and increase the likelihood of overtopping.	1	1	0	0	0	0	0.5
SUBTOTAL	**Max Possible Value = 7**	**4.5**	**4.5**	**4.0**	**4.0**	**4.0**	**2.5**	**3.5**

Table 5-4: Technical Criteria - Conveyance

Category 4: Technical Criteria - Conveyance									
Existing or New Diversion	This criterion considers whether a new diversion is necessary.	1	1	1	1	0	0.5	1	1
Existing or New Conveyance	This criterion considers whether new conveyance is necessary.	1	1	1	1	0	0	0	0
Pumping to Storage	This criterion considers if pumping will be required or if gravity conveyance can be utilized to fill the reservoir	1	1	1	1	0	0	1	0
Pumping Return	This criterion considers the level of pumping required to convey water from the intake point into the reservoir.	1	1	1	1	0	0	1	0
Distance from Headgate	This criterion considers the distance of the reservoir from the headgate. A longer distance from the headgate is undesirable because Increased losses and capacity issues.	0.5	0.5	0.5	0.5	1	1	0	1
SUBTOTAL	**Max Possible Value = 5**	**4.5**	**4.5**	**4.5**	**4.5**	**1.0**	**1.5**	**3.0**	**2.0**

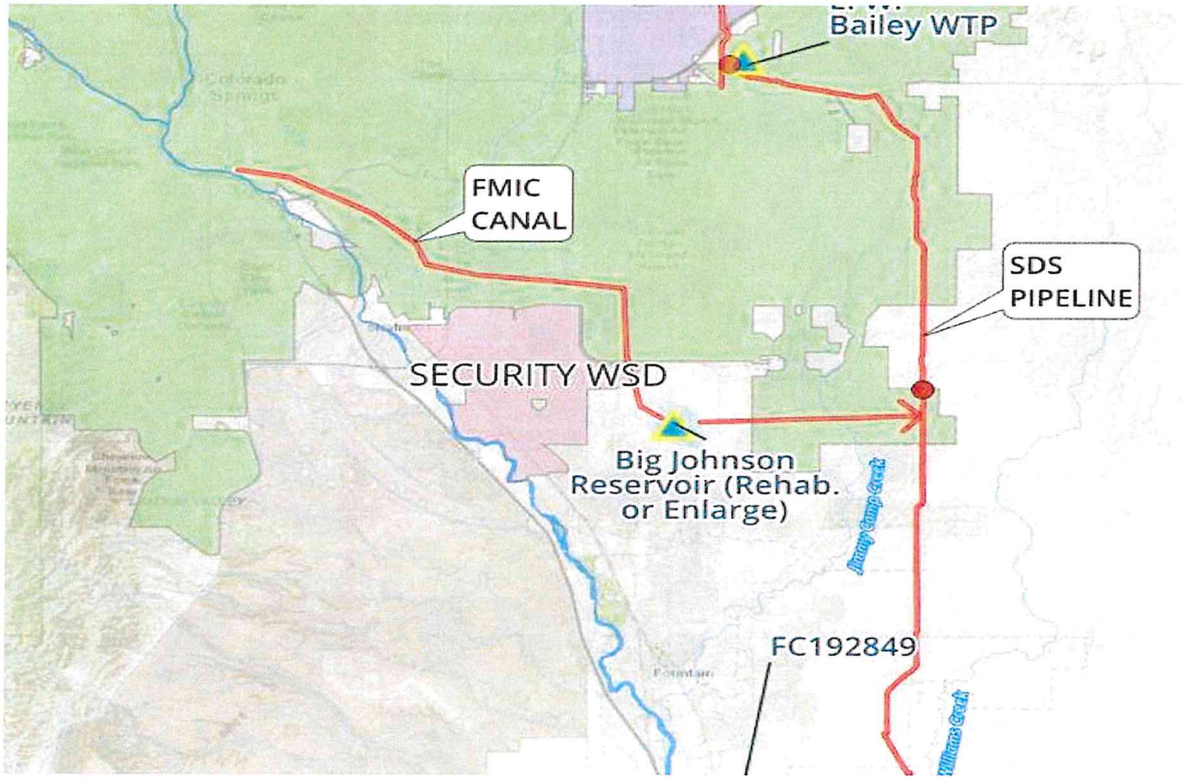
Table 5-5: Environmental/Permitting Criteria

Alternatives								
		AltA1	AltA2	AltB1	AltB2	AltB3	AltC1	AltC2
Criteria	Discussion	Points						
Category 5: Environmental/Permitting Criteria								
Environmental Permitting	This criterion considers possible environmental permitting impacts. A significant component in environmental permitting would be wetlands issues. Wetlands at a site would increase permitting complexity, time, and costs.	1	1	0	0	0	0	1
Water Rights Issues	This criterion considers potential water rights issues. Purchasing existing property with senior water rights and/or existing irrigated areas would be more difficult to obtain.	1	1	1	1	0	0.5	0.5
1041 Permitting Impacts	This criterion considers 1041 permitting issues. Some sites are located in areas that may have more 1041 permitting requirements.	1	1	0.5	0.5	0	0	0
SUBTOTAL	**Max Possible Value = 3**	**3.0**	**3.0**	**1.5**	**1.5**	**0.0**	**0.5**	**1.5**

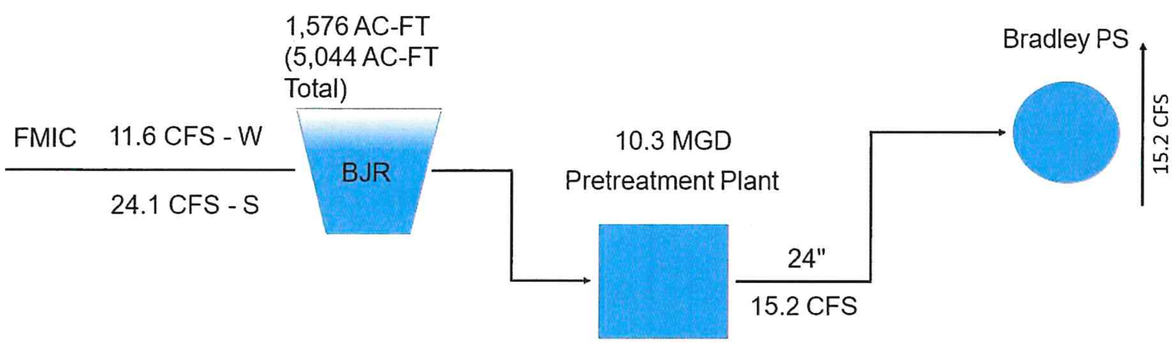
Alternatives								
		AltA1	AltA2	AltB1	AltB2	AltB3	AltC1	AltC2
		Points						
Total	Max Possible Value = 19	15.0	15.0	14.0	14.0	7.0	8.0	9.0

APPENDIX IV: CHAPTER 6 MAPS & DIAGRAMS

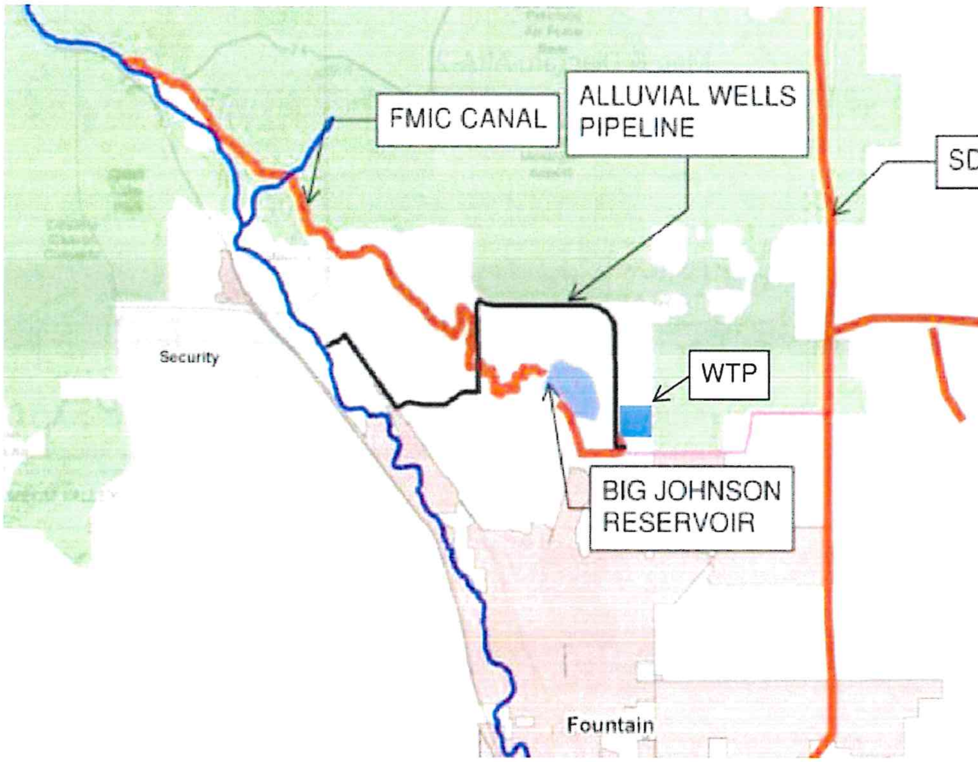
Map & Diagram AltA-2

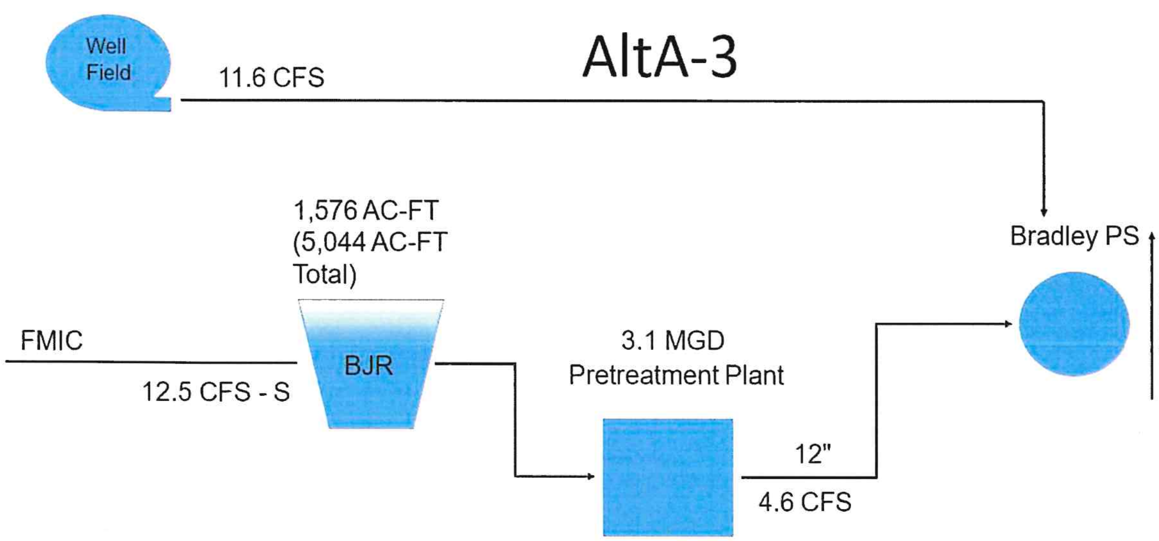


AltA-2



Map & Diagram AltA-3





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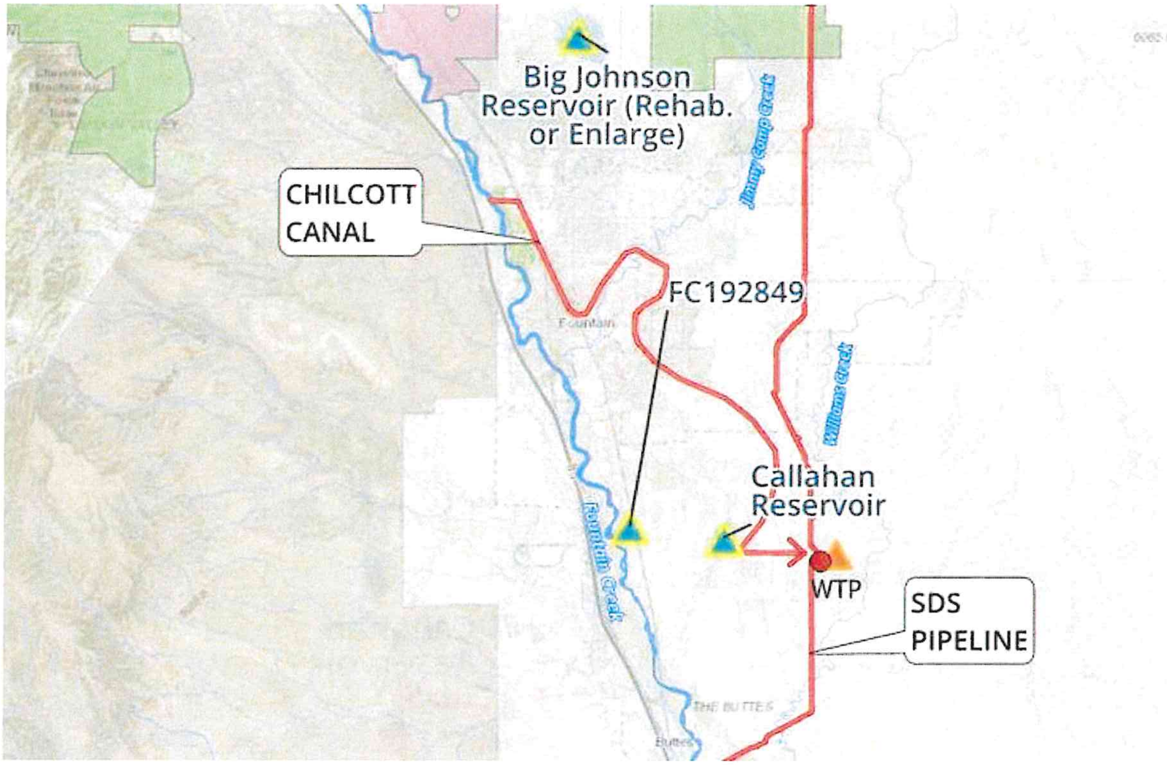

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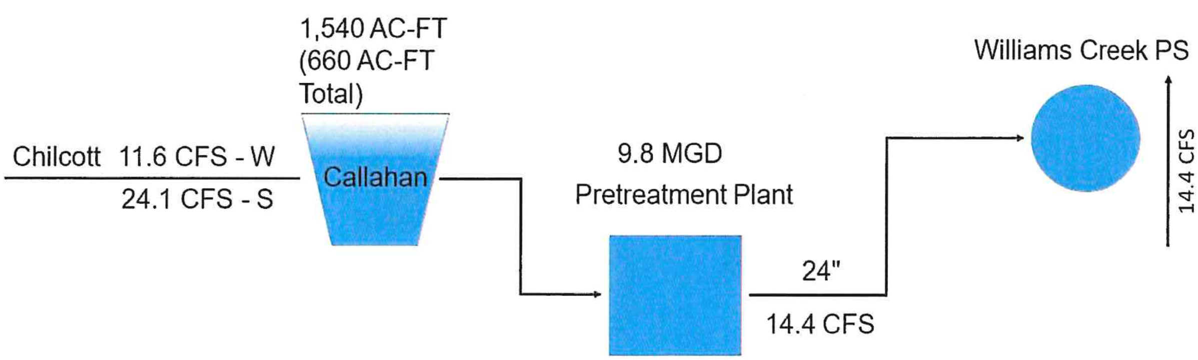
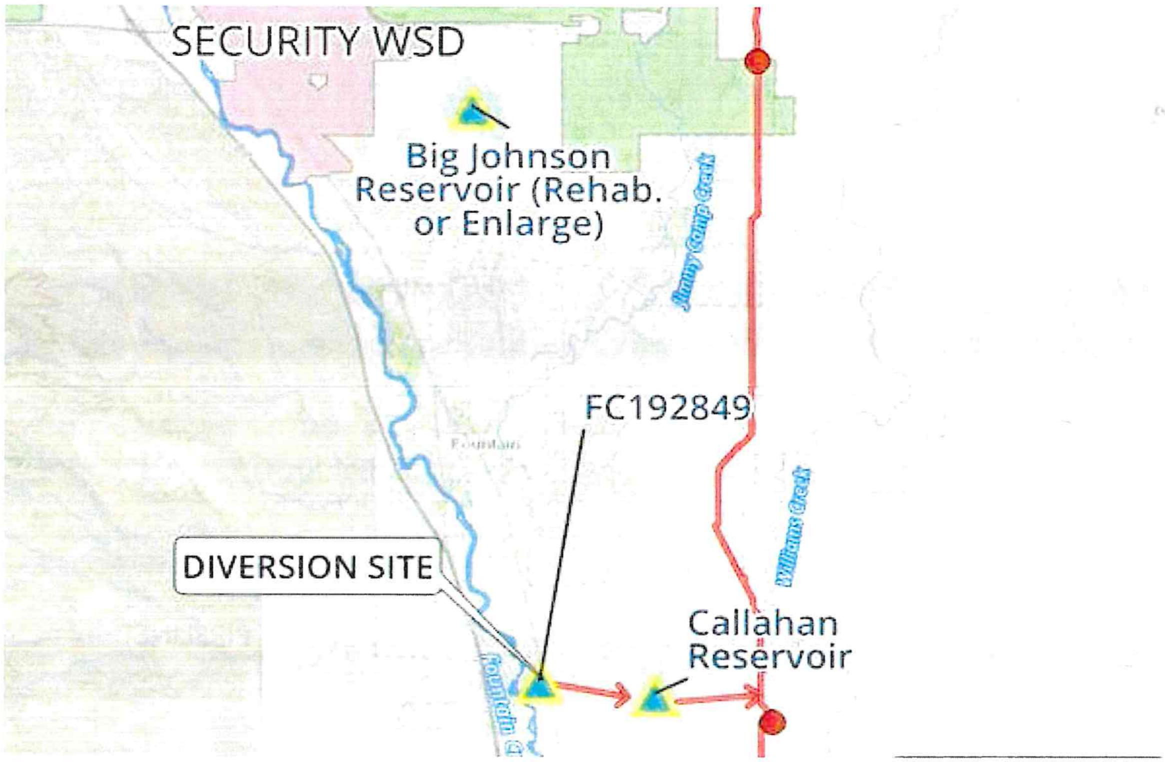
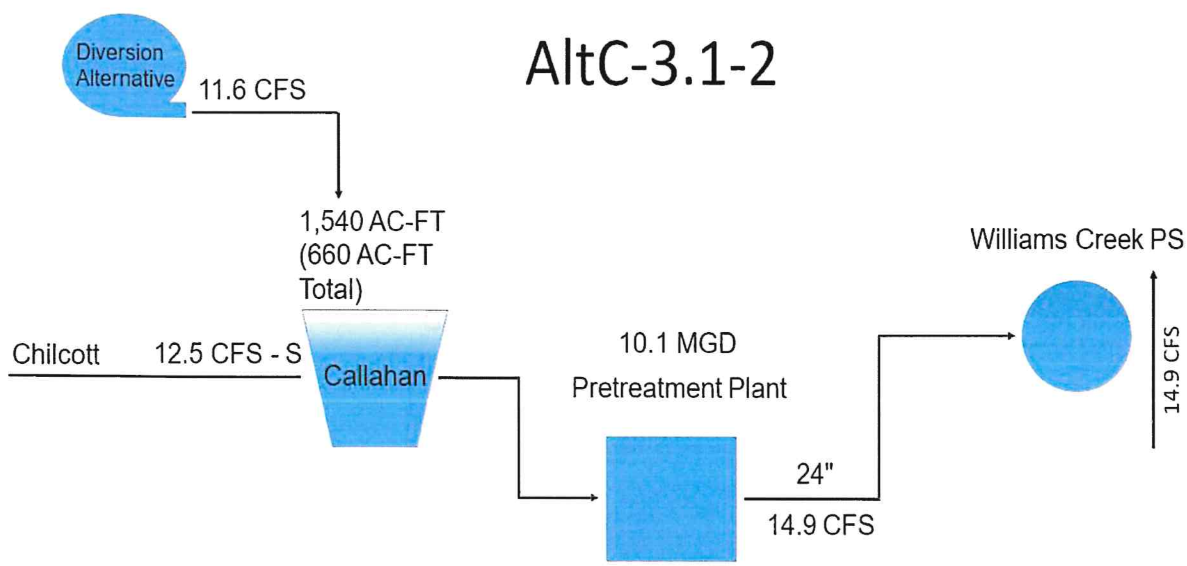
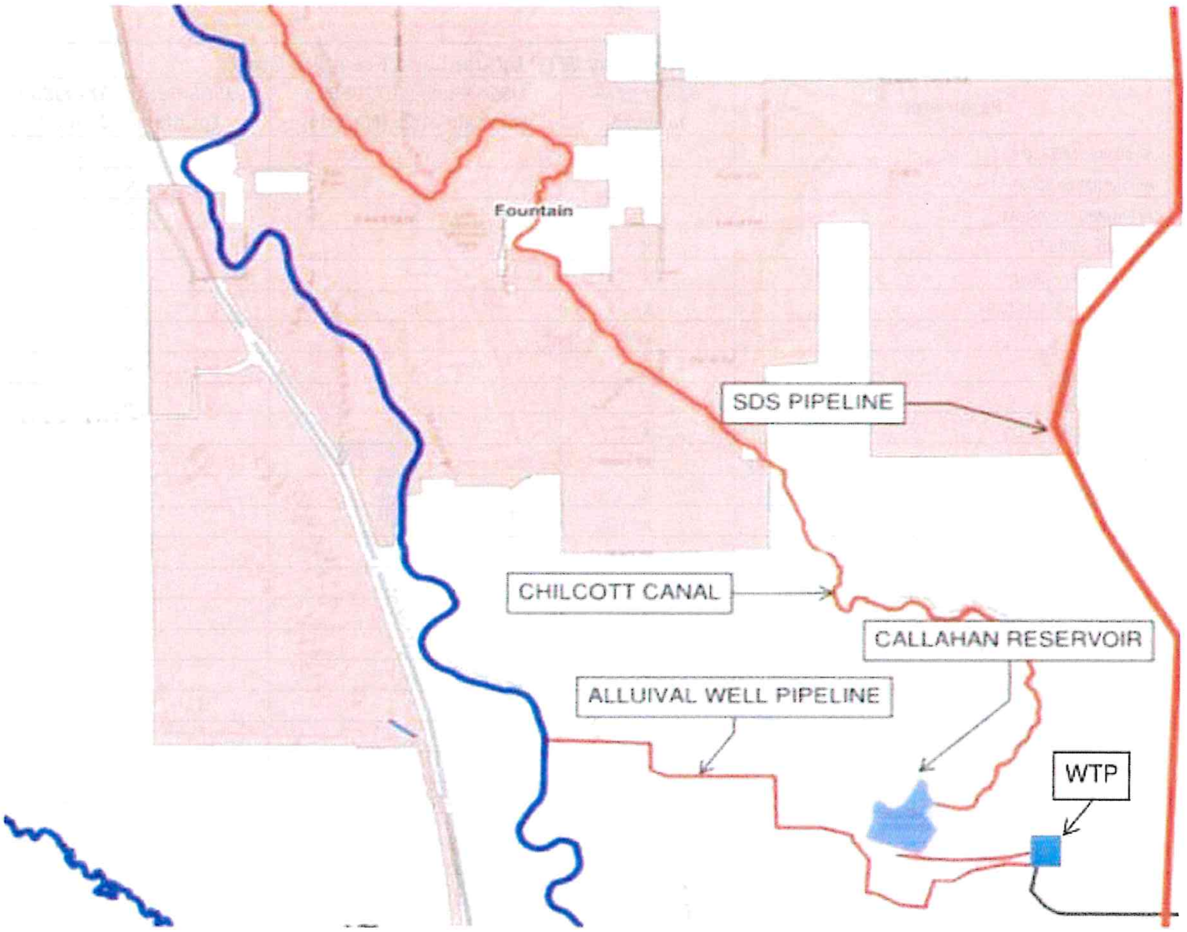


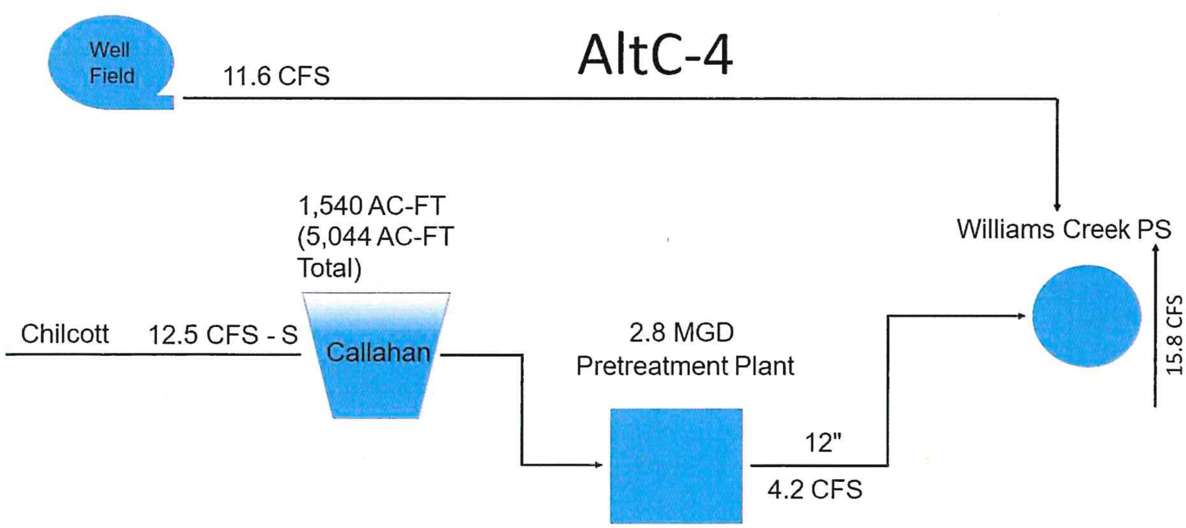
Map & Diagram AltC-3.1-2





Map & Diagram AltC-4





APPENDIX V: WATER QUALITY PARAMETERS

Water Quality Parameters-Bailey WTP Influent and Fountain Creek			
Parameter	Bailey WTP Influent	USGS Gauge: 07105500 Fountain at CS (Nevada)	USGS Gauge: 07105530 Fountain at Janitell
Alkalinity SM 2320 B	X		
Anions (Cl) by 300.0	X		X
Anions (SO4) by 300.0	X	X	X
Bromate, EPA 557	X		
Bromide, EPA 300.0	X		
Conductivity SM 2510 B	X	X	X
D Al EPA 200.7	X		
D Ca EPA 200.7	X	X	X
D Fe EPA 200.7	X		X
D Mg EPA 200.7	X	X	X
D Mn EPA 200.7	X	X	X
Fluoride SM 4500 FC	X		X
Hardness & Ca Hardness by 2340 B	X	X	X
Mercury EPA 1631	X		X
NO2, NO3 by EPA 353.2	X	X	X
Particles SM 10200 J	X		
Phytoplankton SM 10200 F	X		
Temperature deg C SM 2550 B	X	X	X
TOC SM 5310 B	X		
Total Coliform and E.coli SM 9223 B	X	X	X
TR Ag EPA 200.8	X		
TR Al EPA 200.7	X		
TR As EPA 200.8	X	X	X
TR Ba EPA 200.8	X		
TR Be EPA 200.8	X		
TR Ca EPA 200.7	X		
TR Cd EPA 200.8	X	X	X
TR Cr EPA 200.8	X		X
TR Cu EPA 200.8	X	X	X
TR Fe EPA 200.7	X	X	X
TR Mg EPA 200.7	X	X	X
TR Mn EPA 200.7	X	X	X
TR Na EPA 200.7	X		
TR Ni EPA 200.8	X	X	X
TR P EPA 200.7	X	X	X
TR Pb EPA 200.8	X	X	X
TR Sb EPA 200.8	X		
TR Se EPA 200.8	X	X	X
TR Tl EPA 200.8	X		
TR Zn EPA 200.8	X	X	X
Turbidity Hach 10258	X	X	X

D = Dissolved
TR = Total Recoverable
Methods listed for Minimum Detection Levels (MDL)

Donala Water Well Noise Modeling Report

March 11, 2022

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1. Introduction

The purpose of this report is to provide a noise assessment of the operations associated with the proposed Donala Water Well (39.044787, -104.828197) located approximately 100 feet southwest of the intersection of Palm Springs Drive and Pauma Valley Drive in Colorado Springs, Colorado. The noise assessment includes a modeling analysis of a typical water well drilling rig. This report provides the predicted operational noise levels and an assessment of the noise impact in dBA. The location of the Donala Water Well Pad and surrounding area is shown in Figure 1-1.

To assess the operational noise levels of the proposed Donala Water Well Pad, file noise level data of a typical water well drilling rig was utilized in the noise modeling. The noise model was developed using SoundPLAN 8.2 software.

The following is provided in this report:

- A brief introduction of the fundamentals of noise
- A discussion of noise modeling methodology
- An assessment of the predicted operational noise levels

Figure 1-1 Donala Water Well Pad Location

2. Noise Fundamentals

Sound is most commonly experienced by people as pressure waves passing through air. These rapid fluctuations in air pressure are processed by the human auditory system to produce the sensation of sound. The rate at which sound pressure changes occur is called the frequency. Frequency is usually measured as the number of oscillations per second or Hertz (Hz). Frequencies that can be heard by a healthy human ear range from approximately 20 Hz to 20,000 Hz. Toward the lower end of this range are low-pitched sounds, including those that might be described as a "rumble" or "boom". At the higher end of the range are high-pitched sounds that might be described as a "screech" or "hiss".

2.1 Environmental Noise

Environmental noise generally derives, in part, from a combination of distant noise sources. Such sources may include common experiences such as distant traffic, wind in trees, and distant industrial or farming activities. These distant sources create a low-level "background noise" in which no particular individual source is identifiable. Background noise is often relatively constant from moment to moment but varies slowly from hour to hour as natural forces change or as human activity follows its daily cycle.

Superimposed on this low-level, slowly varying background noise is a succession of identifiable noisy events of relatively brief duration. These events may include the passing of single-vehicles, aircraft flyovers, screeching of brakes, and other short-term events. The presence of these short-term events causes the noise level to fluctuate. Typical indoor and outdoor A-weighted sound levels are shown in Figure 2-1.

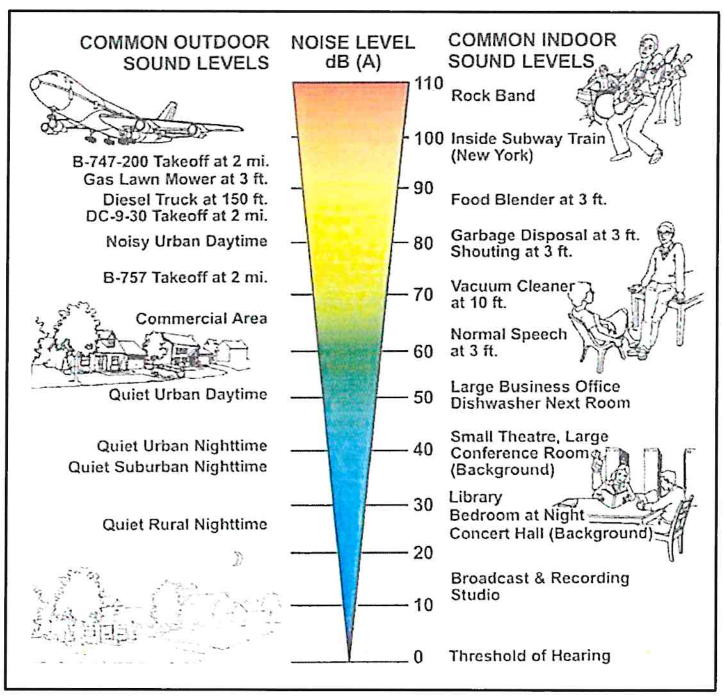


Figure 2-1 Typical Indoor and Outdoor A-Weighted Sound Levels

2.2 Relative Loudness of Environmental Noise

Published data exists describing how humans generally respond to changes in relative loudness. Table 2-1, adapted from the Highway Traffic Noise: Analysis and Abatement Guidance (revised December 2011) published by the Federal Highway Administration, shows typical responses to changes in relative loudness.

Table 2-1 Decibel Changes, Loudness, and Relative Loudness[1]

Sound Level Change	Relative Loudness
0 dB(A)	Reference
-3 dB(A)	Barely Perceptible Change
-5 dB(A)	Readily Perceptible Change
-10 dB(A)	Half as Loud
-20 dB(A)	1/4 as Loud
-30 dB(A)	1/8 as Loud

The table describes reductions in noise levels, but the opposite holds true for increases in noise level.

[1] Table adapted from FHWA Highway Traffic Noise: Analysis and Abatement Guidance, revised December 2011

3. Donala Water Well Pad Noise Modeling

3.1 Noise Modeling Methodology

The noise modeling was completed with use of three-dimensional computer noise modeling software. All models in this report were developed with SoundPLAN 8.2 software using the ISO 9613-2 standard. Noise levels are predicted based on the locations, noise levels and frequency spectra of the noise sources, and the geometry and reflective properties of the local terrain, buildings and barriers. To ensure a conservative assessment and compliance with ISO 9613-2 standards, light to moderate winds are assumed to be blowing from the source to receptor. The predicted noise levels represent only the contribution of the drilling operations and do not include ambient noise or noise from other facilities. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other facilities, other human activity, or environmental factors.

Sound level data utilized in the compressor model was based on file data of a typical water well drilling rig. Drilling rig placement and orientation was coordinated with Leonard Rice Engineers, Inc and oriented to minimize noise impact when possible. The predicted modeling results are dependent on equipment and mitigation orientation as indicated. The water well drilling rig sound power level can be seen in Table 3-1.

Table 3-1 Equipment Sound Power Level (dBA)

Equipment	Quantity	Individual Component Sound Power Level (dBA)
Compressor	2	105
Drilling Rig Engine	1	116
Drilling Rig Exhaust	1	111
Generator	2	98
Shaker	1	98

3.2 Noise Sensitive Receptors

The noise sensitive receptors have been modeled 25 feet from the exterior wall of the nearest occupied structures in the direction of the Donala Water Well Pad. The locations of the noise sensitive receptors and surrounding environment can be seen in Figure 3-1.

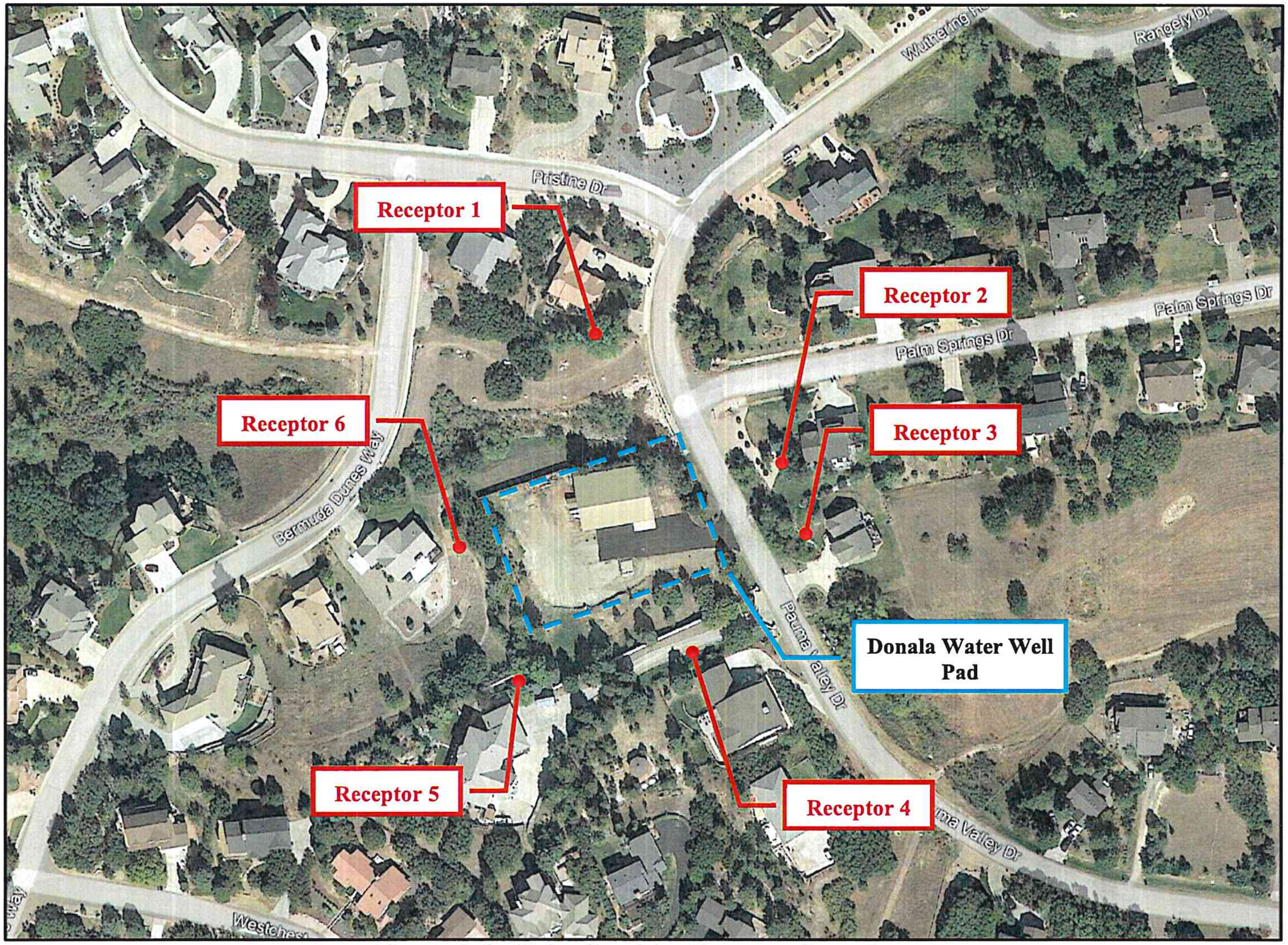


Figure 3-1 Noise Sensitive Receptor Locations

3.3 Unmitigated Noise Modeling Results

The results of the unmitigated noise modeling are presented in Table 3-2. The locations in the table correspond to the locations identified in Figure 3-1. The predicted noise levels represent only the contribution of the project operations and do not include ambient noise or noise from other facilities. Figure 3-2 shows the Unmitigated Drilling Noise Contour Map in dBA. The noise contours are provided in 5 dB increments with the color scale indicating the sound level of each contour.

Table 3-2 Unmitigated Noise Modeling Results (dBA)

Receptor	Location Description	Unmitigated
Location 1	10 Wuthering Heights Drive	63
Location 2	15 Palm Springs Drive	67
Location 3	40 Pauma Valley Drive	66
Location 4	55 Pauma Valley Drive	71
Location 5	45 Pauma Valley Drive	74
Location 6	14645 Bermuda Dunes Way	75

The results of the unmitigated noise modeling indicate that the operational sound pressure levels at the nearest residences adjacent to the site range between 63 dBA and 75 dBA for drilling operations. Two mitigation scenarios have been included for drilling operations to show the noise reduction in the surrounding area.

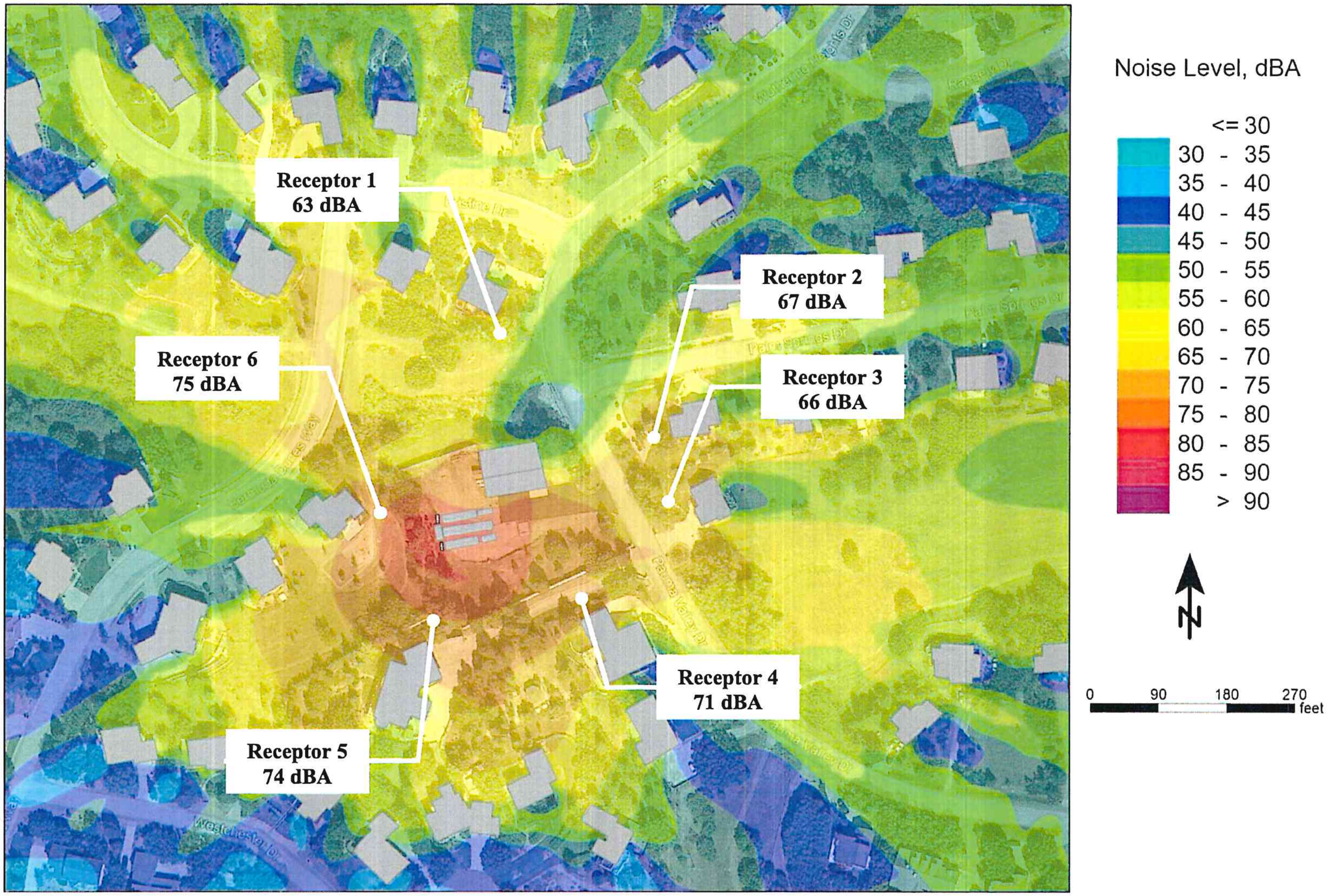


Figure 3-2 Unmitigated Drilling Noise Contour Map (dBA)

3.4 Scenario 1 Mitigated Modeling Results

Noise mitigation for drilling operations has been included in the modeling to reduce noise levels in the surrounding environment. The noise mitigation included in the modeling is described below:

- Approximately 400 total linear feet of 16-foot-high, Sound Transmission Class (STC) 32 acoustical wall installed on the north, west, and south perimeter of the site.
- Approximately 80 total linear feet of 16-foot-high, Sound Transmission Class (STC) 25 acoustical panels installed on the east perimeter of the site.

The layout for the modeled mitigation scenario is shown in Figure 3-3.

Figure 3-3 Recommended Scenario 1 Mitigation Layout

The mitigated modeling includes the acoustical mitigation recommendations shown in Figure 3-3. The results of the mitigated noise modeling are presented in Table 3-3. The locations in the tables correspond to the locations identified in Figure 3-1. The predicted noise levels represent only the contribution of the drilling operations and do not include ambient noise or noise from other facilities. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other facilities, other human activity, or environmental factors.

Table 3-3 Scenario 1 Mitigated Noise Modeling Results (dBA)

Receptor	Location Description	Unmitigated	Mitigated	Difference
Location 1	10 Wuthering Heights Drive	63	59	4
Location 2	15 Palm Springs Drive	67	65	2
Location 3	40 Pauma Valley Drive	66	64	2
Location 4	55 Pauma Valley Drive	71	70	1
Location 5	45 Pauma Valley Drive	74	74	0
Location 6	14645 Bermuda Dunes Way	75	65	10

The results of the mitigated noise modeling indicate that the operational sound pressure levels at the nearest residences adjacent to the site range between 59 dBA and 74 dBA for drilling operations. The results of the mitigated noise modeling indicate that with the implementation of the recommended mitigation the proposed drilling operations are predicted to reduce noise levels in the surrounding environment up to 10 dBA. The results of the mitigated noise modeling are also shown as noise contour maps. Figure 3-4 shows the Scenario 1 Mitigated Drilling Noise Contour Map in the A-weighted scale and

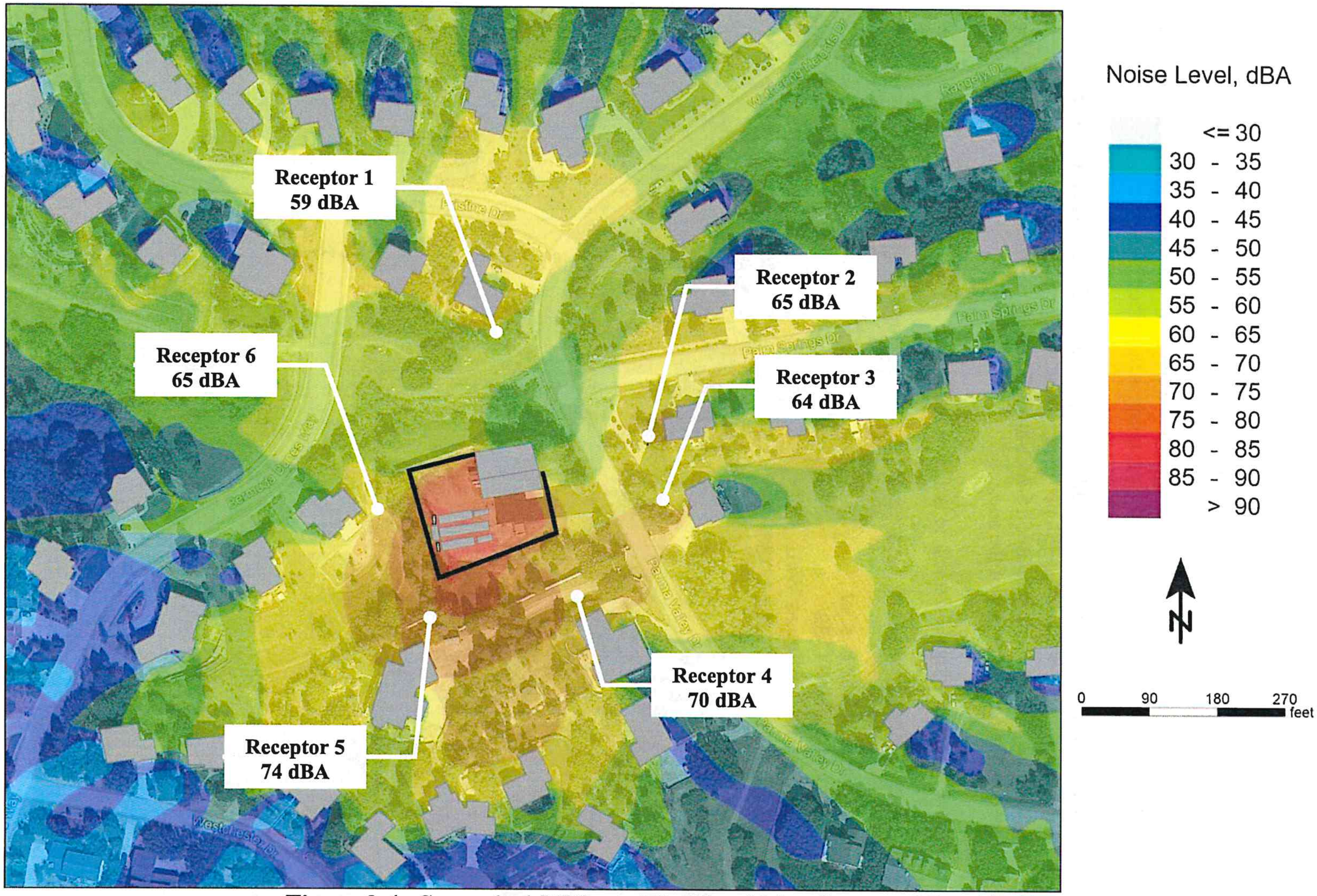


Figure 3-4 Scenario 1 Mitigated Drilling Noise Contour Map (dBA)

3.5 Scenario 2 Mitigated Modeling Results

Noise mitigation for drilling operations has been included in the modeling to reduce noise levels in the surrounding environment. The noise mitigation included in the modeling is described below:

- Approximately 400 total linear feet of 32-foot-high, Sound Transmission Class (STC) 32 acoustical wall installed on the north, west, and south perimeter of the site.
- Approximately 80 total linear feet of 16-foot-high, Sound Transmission Class (STC) 25 acoustical panels installed on the east perimeter of the site.

The layout for the modeled mitigation scenario is shown in Figure 3-5.

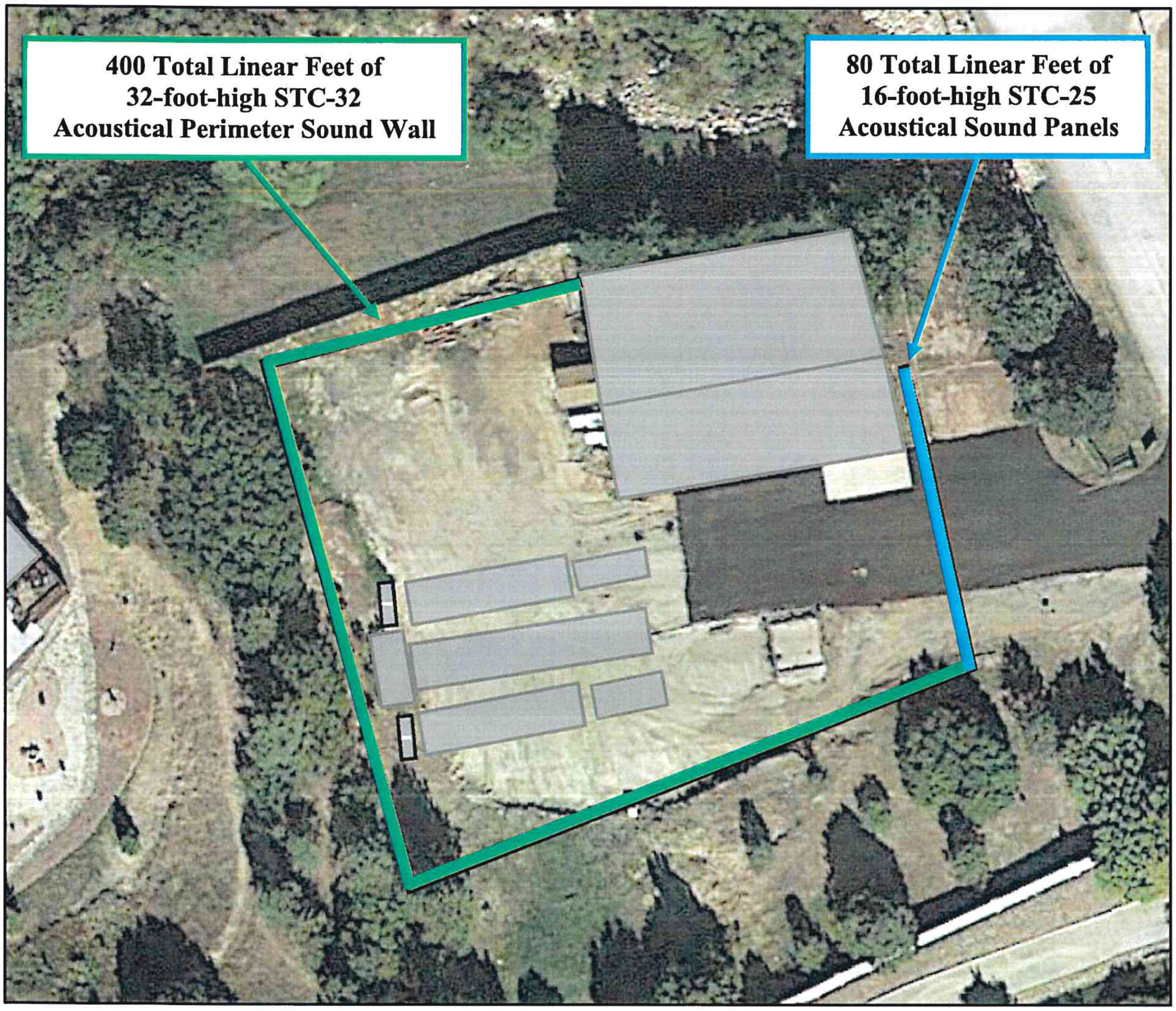


Figure 3-5 Recommended Scenario 2 Mitigation Layout

The mitigated modeling includes the acoustical mitigation recommendations shown in Figure 3-5. The results of the mitigated noise modeling are presented in Table 3-3. The locations in the tables correspond to the locations identified in Figure 3-1. The predicted noise levels represent only the contribution of the drilling operations and do not include ambient noise or noise from other facilities. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other facilities, other human activity, or environmental factors.

Table 3-4 Scenario 2 Mitigated Noise Modeling Results (dBA)

Receptor	Location Description	Unmitigated	Mitigated	Difference
Location 1	10 Wuthering Heights Drive	63	54	9
Location 2	15 Palm Springs Drive	67	65	2
Location 3	40 Pauma Valley Drive	66	64	2
Location 4	55 Pauma Valley Drive	71	60	11
Location 5	45 Pauma Valley Drive	74	58	16
Location 6	14645 Bermuda Dunes Way	75	58	17

The results of the mitigated noise modeling indicate that the operational sound pressure levels at the nearest residences adjacent to the site range between 54 dBA and 65 dBA for drilling operations. The results of the mitigated noise modeling indicate that with the implementation of the recommended mitigation the proposed drilling operations are predicted to reduce noise levels in the surrounding environment up to 17 dBA. The results of the mitigated noise modeling are also shown as noise contour maps. Figure 3-6 shows the Scenario 2 Mitigated Drilling Noise Contour Map in the A-weighted scale and

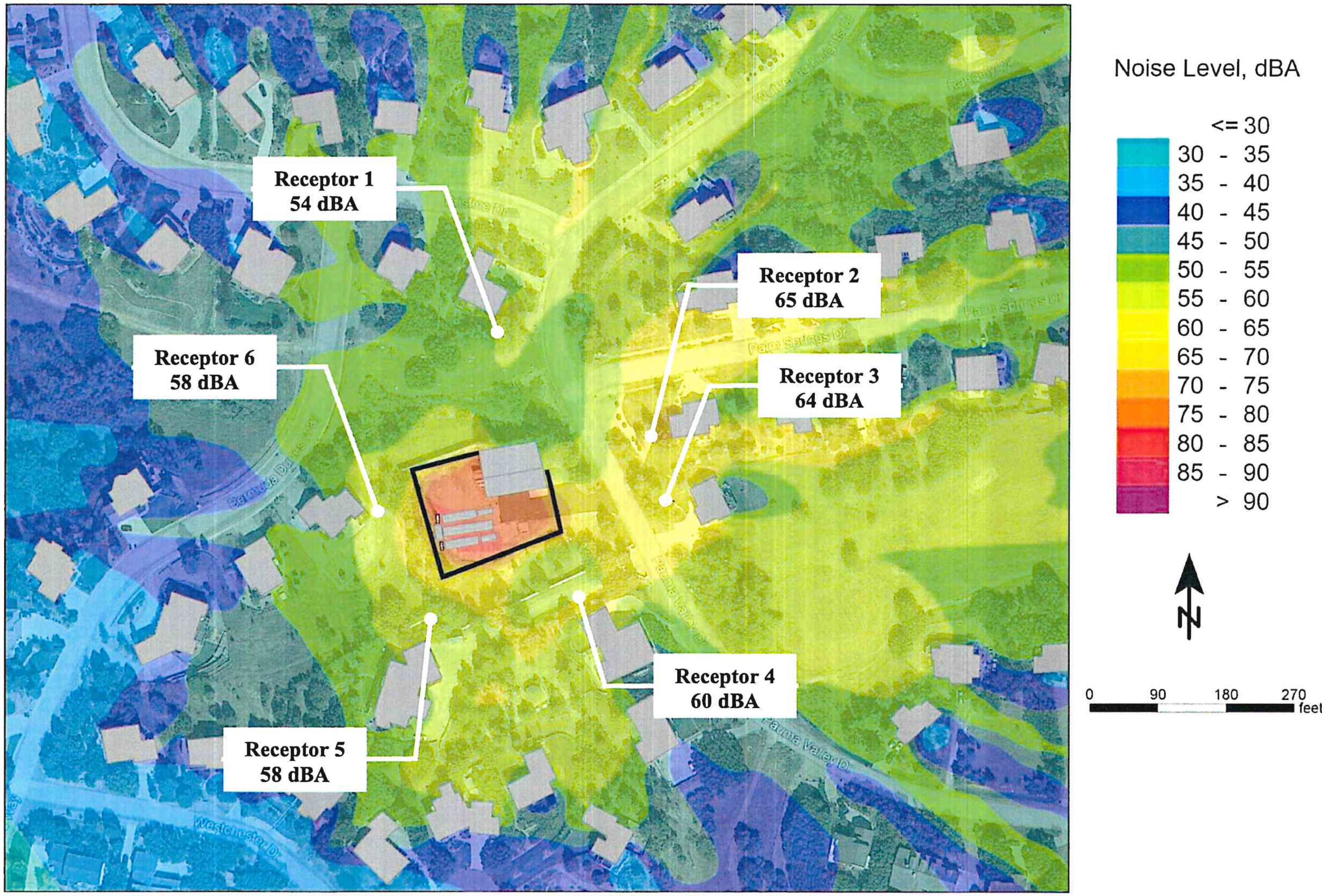


Figure 3-6 Scenario 2 Mitigated Drilling Noise Contour Map (dBA)

4. Conclusion

A noise model representing the proposed operations at the Donala Water Well Pad was created to assess the predicted operational noise levels associated with the water well drilling operations. The results of the unmitigated noise modeling indicate that the operational sound pressure levels at the nearest residences adjacent to the site range between 63 dBA and 75 dBA for drilling operations. Two mitigation scenarios were included for drilling operations to show the noise reduction in the surrounding area.

The results of the mitigated noise modeling indicate that the operational sound pressure levels at the nearest residences adjacent to the site range between 59 dBA and 74 dBA for drilling operations. The results of the mitigated noise modeling indicate that with the implementation of the recommended mitigation the proposed drilling operations are predicted to reduce noise levels in the surrounding environment up to 10 dBA.

The results of the mitigated noise modeling indicate that the operational sound pressure levels at the nearest residences adjacent to the site range between 54 dBA and 65 dBA for drilling operations. The results of the mitigated noise modeling indicate that with the implementation of the recommended mitigation the proposed drilling operations are predicted to reduce noise levels in the surrounding environment up to 17 dBA.

Appendix A - Glossary of Acoustical Terms

Ambient Noise
The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources both near and far.

Average Sound Level
See Equivalent-Continuous Sound Level

A-Weighted Sound Level, dB(A)
The sound level obtained by use of A-weighting. Weighting systems were developed to measure sound ina way that more closely mimics the ear's natural sensitivity relative to frequency so that the instrument is less sensitive to noise at frequencies where the human ear is less sensitive and more sensitive at frequencies where the human ear is more sensitive.

C-Weighted Sound Level, dBC
The sound level obtained by use of C-weighting. Follows the frequency sensitivity of the human ear at very high noise levels. The C-weighting scale is quite flat and therefore includes much more of the low-frequency range of sounds than the A and B scales. In some jurisdictions, C-weighted sound limits are used to limit the low-frequency content of noise sources.

Community Noise Equivalent Level (CNEL)
A 24-hour A-weighted average sound level which takes into account the fact that a given level of noise may be more or less tolerable depending on when it occurs. The CNEL measure of noise exposure weights average hourly noise levels by 5 dB for the evening hours (between 7:00 pm and 10:00 pm), and 10 dB between 10:00 pm and 7:00 am, then combines the results with the daytime levels to produce the final CNEL value. It is measured in decibels, dB.

Day-Night Average Sound Level (Ldn)
A measure of noise exposure level that is similar to CNEL except that there is no weighting applied to the evening hours of 7:00 pm to 10:00 pm. It is measured in decibels, dB.

Daytime Average Sound Level
The time-averaged A-weighted sound level measured between the hours of 7:00 am to 7:00 pm. It is measured in decibels, dB.

Decibel (dB)
The basic unit of measurement for sound level.

Direct Sound
Sound that reaches a given location in a direct line from the source without any reflections.

Divergence
The spreading of sound waves from a source in a free field, resulting in a reduction in sound pressure level with increasing distance from the source.

Energy Basis
This refers to the procedure of summing or averaging sound pressure levels on the basis of their squared pressures. This method involves the conversion of decibels to pressures, then performing the necessary arithmetic calculations, and finally changing the pressure back to decibels.

Equivalent-Continuous Sound Level (Leq)
The average sound level measured over a specified time period. It is a single-number measure of time-varying noise over a specified time period. It is the level of a steady sound that, in a stated time period and at a stated location, has the same A-Weighted sound energy as the time-varying sound. For example, a person who experiences an Leq of 60 dB(A) for a period of 10 minutes standing next to a busy street is exposed to the same amount of sound energy as if he had experienced a constant noise level of 60 dB(A) for 10 minutes rather than the time-varying traffic noise level.

Fast Response
A setting on the sound level meter that determines how sound levels are averaged over time. A fast sound level is always more strongly influenced by recent sounds, and less influenced by sounds occurring in the distant past, than the corresponding slow sound level. For the same non-steady sound, the maximum fast sound level is generally greater than the corresponding maximum slow sound level. Fast response is typically used to measure impact sound levels.

Field Impact Insulation Class (FIIC)
A single number rating similar to the impact insulation class except that the impact sound pressure levels are measured in the field.

Field Sound Transmission Class (FSTC)
A single number rating similar to sound transmission class except that the transmission loss values used to derive this class are measured in the field.

Flanking Sound Transmission
The transmission of sound from a room in which a source is located to an adjacent receiving room by paths other than through the common partition. Also, the diffraction of noise around the ends of a barrier.

Frequency
The number of oscillations per second of a sound wave

Hourly Average Sound Level (HNL)
The equivalent-continuous sound level, Leq, over a 1-hour time period.

Impact Insulation Class (IIC)
A single number rating used to compare the effectiveness of floor/ceiling assemblies in providing reduction of impact-generated sound such as the sound of a person's walking across the upstairs floor.

Impact Noise
The noise that results when two objects collide.

Impulse Noise
Noise of a transient nature due to the sudden impulse of pressure like that created by a gunshot or balloon bursting.

Insertion Loss
The decrease in sound power level measured at the location of the receiver when an element (e.g., a noise barrier) is inserted in the transmission path between the sound source and the receiver.

Inverse Square Law
A rule by which the sound intensity varies inversely with the square of the distance from the source. This results in a 6dB decrease in sound pressure level for each doubling of distance from the source.

L_n Sound Level
Time-varying noise environments may be expressed in terms of the noise level that is exceeded for a certain percentage of the total measurement time. These statistical noise levels are denoted L_n, where n is the percent of time. For example, the L_{50} is the noise level exceeded for 50% of the time. For a 1-hour measurement period, the L_{50} would be the noise level exceeded for a cumulative period of 30 minutes in that hour.

Masking
The process by which the threshold of hearing for one sound is raised by the presence of another sound.

Maximum Sound Level (Lmax)
The greatest sound level measured on a sound level meter during a designated time interval or event.

NC Curves (Noise Criterion Curves)
A system for rating the noisiness of an occupied indoor space. An actual octave-band spectrum is compared with a set of standard NC curves to determine the NC level of the space.

Noise Reduction
The difference in sound pressure level between any two points.

Noise Reduction Coefficient (NRC)
A single number rating of the sound absorption properties of a material. It is the average of the sound absorption coefficients at 250, 500, 1000, and 2000 Hz, rounded to the nearest multiple of 0.05.

Octave
The frequency interval between two sounds whose frequency ratio is 2. For example, the frequency interval between 500 Hz and 1,000 Hz is one octave.

Octave-Band Sound Level
For an octave frequency band, the sound pressure level of the sound contained within that band.

One-Third Octave
The frequency interval between two sounds whose frequency ratio is 2^(1/3). For example, the frequency interval between 200 Hz and 250 Hz is one-third octave.

One-Third-Octave-Band Sound Level
For a one-third-octave frequency band, the sound pressure level of the sound contained within that band.

Outdoor-Indoor Transmission Class (OITC)
A single number rating used to compare the sound insulation properties of building façade elements. This rating is designed to correlate with subjective impressions of the ability of façade elements to reduce the overall loudness of ground and air transportation noise.

Peak Sound Level (Lpk)
The maximum instantaneous sound level during a stated time period or event.

Pink Noise
Noise that has approximately equal intensities at each octave or one-third-octave band.

Point Source
A source that radiates sound as if from a single point.

RC Curves (Room Criterion Curves)
A system for rating the noisiness of an occupied indoor space. An actual octave-band spectrum is compared with a set of standard RC curves to determine the RC level of the space.

Real-Time Analyzer (RTA)
An instrument for the determination of a sound spectrum.

Receiver
A person (or persons) or equipment which is affected by noise.

Reflected Sound
Sound that persists in an enclosed space as a result of repeated reflections or scattering. It does not include sound that travels directly from the source without reflections.

Reverberation
The persistence of a sound in an enclosed or partially enclosed space after the source of the sound has stopped, due to the repeated reflection of the sound waves.

Room Absorption
The total absorption within a room due to all objects, surfaces and air absorption within the room. It is measured in Sabins or metric Sabins.

Slow Response
A setting on the sound level meter that determines how measured sound levels are averaged over time. A slow sound level is more influenced by sounds occurring in the distant past that the corresponding fast sound level.

Sound
A physical disturbance in a medium (e.g., air) that is capable of being detected by the human ear.

Sound Absorption Coefficient
A measure of the sound-absorptive property of a material.

Sound Insulation
The capacity of a structure or element to prevent sound from reaching a receiver room either by absorption or reflection.

Sound Level Meter (SLM)
An instrument used for the measurement of sound level, with a standard frequency-weighting and standard exponentially weighted time averaging.

Sound Power Level
A physical measure of the amount of power a sound source radiates into the surrounding air. It is measured in decibels.

Sound Pressure Level
A physical measure of the magnitude of a sound. It is related to the sound's energy. The terms sound pressure level and sound level are often used interchangeably.

Sound Transmission Class (STC)
A single number rating used to compare the sound insulation properties of walls, floors, ceilings, windows, or doors. This rating is designed to correlate with subjective impressions of the ability of building elements to reduce the overall loudness of speech, radio, television, and similar noise sources in offices and buildings.

Source Room
A room that contains a noise source or sources

Spectrum
The spectrum of a sound wave is a description of its resolution into components, each of different frequency and usually different amplitude.

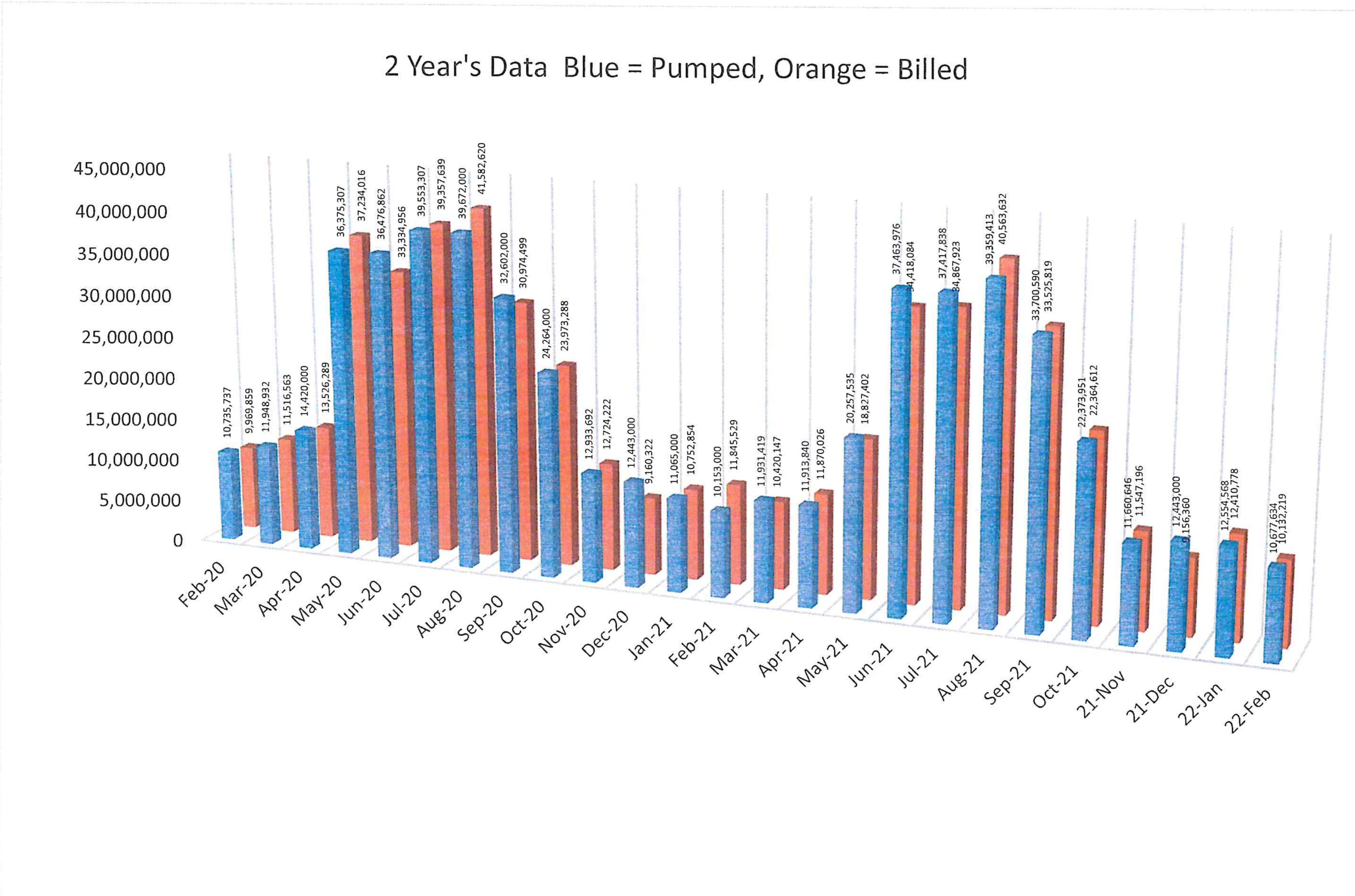
Tapping Machine
A device used in rating different floor constructions against impacts. It produces a series of impacts on the floor under test, 10 times per second.

Tone
A sound with a distinct pitch

Transmission Loss (TL)
A property of a material or structure describing its ability to reduce the transmission of sound at a particular frequency from one space to another. The higher the TL value the more effective the material or structure is in reducing sound between two spaces. It is measured in decibels.

White Noise
Noise that has approximately equal intensities at all frequencies.

Windscreen
A porous covering for a microphone, designed to reduce the noise generated by the passage of wind over the microphone.


2 Year's Data Blue = Pumped, Orange = Billed
45,000,000
40,000,000
35,000,000
30,000,000
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
10,735,737
9,969,859
11,948,932
11,516,563
14,420,000
13,526,289
36,375,307
37,234,016
36,476,862
33,334,956
39,553,307
39,357,639
39,672,000
41,582,620
32,602,000
30,974,499
24,264,000
23,973,288
12,933,692
12,724,222
12,443,000
9,160,322
11,065,000
10,752,854
10,153,000
11,845,529
11,931,419
10,420,147
11,913,840
11,870,026
20,257,535
18,827,402
37,463,976
34,418,084
37,417,838
34,867,923
39,359,413
40,563,632
33,700,590
33,525,819
22,373,951
22,364,612
11,660,646
11,547,196
12,443,000
9,156,360
12,554,568
12,410,778
10,677,634
10,132,219
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
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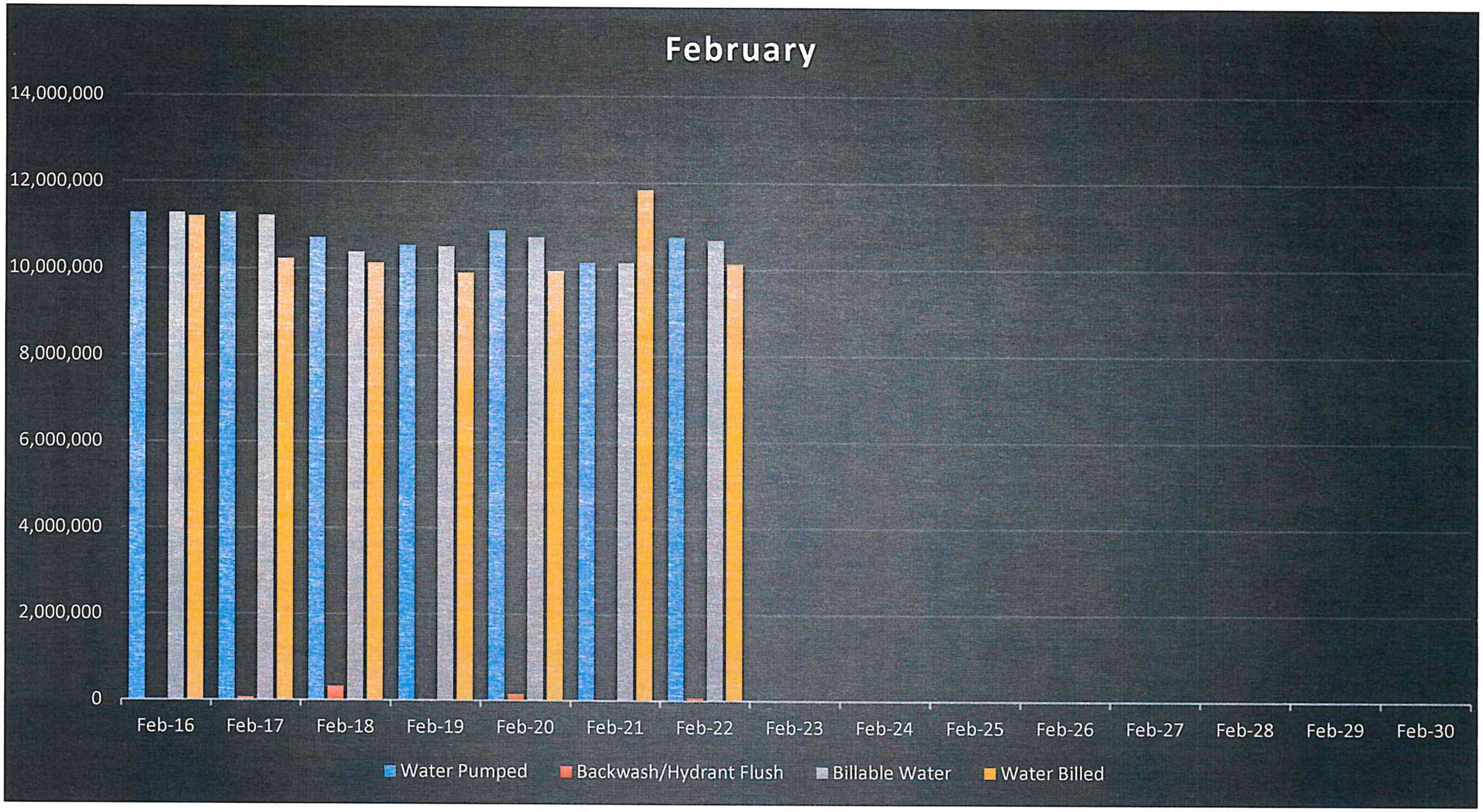
22-Jan
22-Feb



	Feb-16	Feb-17	Feb-18	Feb-19	Feb-20	Feb-21	Feb-22	Feb-23	Feb-24	Feb-25	Feb-26	Feb-27	Feb-28	Feb-29	Feb-30
Water Pumped	11,287,964	11,300,000	10,717,807	10,544,275	10,889,737	10,158,000	10,747,634								
Backwash/Hydrant Flush	0	70,000	329,000	25,000	154,000	5,000	70,000								
Billable Water	11,287,964	11,230,000	10,388,807	10,519,275	10,735,737	10,153,000	10,677,634	0	0	0	0	0	0	0	0
Water Billed	11,211,403	10,234,339	10,140,836	9,917,836	9,969,859	11,845,529	10,132,219								

DONALA WATER & SANITATION DISTRICT BOARD STATISTICS -- MONTHLY VOLUME

FEBRUARY 2022

1. Water Pumped	10,747,634	Gallons
Well 9A (no read)		
Willow Creek Water	0	Gallons
Total Water Produced	**10,747,634**	**Gallons**
2. Backwash Robert Hull Plant	0	Gallons
Backwash Holbein Plant	0	Gallons
Hydrant Flush and Misc	70,000	Gallons
Non-Revenue Water	**70,000**	**Gallons**
3. **Billable Water Produced** (Includes #1 Minus #2)	**10,677,634**	**Gallons**
4. Water Billed All Routes	10,120,198	Gallons
Bulk Water Sales	12,021	Gallons
Total Water Actually Billed This Month	**10,132,219**	**Gallons**
Factoring in the difference in read dates using the daily average.		Gallons
Water Billed Plus Average Use in Read Date Difference	**10,132,219**	**Gallons**
5. %Billed vs. Distributed	94.89%	545,415 Gallons
6. Donala Waste Influent	10,403,000	47.88%
7. Triview Waste Influent	10,186,000	46.88%
8. Forest Lakes Influent	1,140,000	5.25%

		SF	MF	MF (SFE)	COMM	COM M(sfe)	IRR OTHER	Irr Other (SFE)	TOTAL	TOTAL (SFE)	Growth
2021	DEC	2179	398	398	49	287	35	35	2661	2899	#REF!
2022	JAN	2187	398	398	49	287	35	35	2669	2907	0.28%
	FEB	2187	398	398	49	287	35	35	2669	2907	0.00%
	MAR										
	APR										
	MAY										
	JUN										
	JUL										
	AUG										
	SEP										
	OCT										
	NOV										
	DEC										
2023	JAN										
	FEB										
	MAR										
	APR										
	MAY										
	JUN										
	JUL										
	AUG										
	SEP										
	OCT										

Board Report

March 2022

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 a high-quality effluent. Our biosolids continue to be above the TENORM exempt level of 5 pCi/gm.

- Our November biosolids radium test results from Energy Laboratories were:
  1. Radium 226 – 14.1 pCi/g-dry
  2. Radium 228 -- 8.9 pCi/g-dry

We collected and sent another round of samples to Energy Laboratory in Wyoming on February 14th. We hope our TENORM levels in the aerobic digester will begin to trend downward with Hobein offline and the work by Triview to address radium in their water production. We will continue to test for TENORM in preparation for Rule 20 of the Hazardous Materials and Waste Management Division that goes into effect on July 14, 2022. We are working with Mike Scharp, Rocky Mt Region VP of Sales and Environmental Services of Denali Water to remain in compliance with Rule 20.

- Plant performance for BOD and suspended solids for the past month continues to be outstanding:
  1. BOD5 results – 99% removal
  2. Total Suspended Solids results – 98% removal

Recent plant operation and management activities:

- We will be collecting and sending out biosolids samples on the 21st of this month. Process control has been very good this winter with Aaron Tolman and I monitoring and adjusting air and wasting as needed. Foam has remained under control, and we have not needed to use PAXX for foam management.
- We purchased new UV bulbs in February as the ones in use have reached the end of their life cycle. The South Digester RAS pump failed on March 7, 2022. It was replaced it this week.
- We have been experiencing a loss of flow data for Forrest Lakes that began on February 10. The flow report I generate each month has been and will continue to be impacted until Timberline can fix this problem.