8. For possible action: Matters pertaining to Boulder City’s treated effluent water:

A. Presentation offered by the Southern Nevada Water Authority (SNWA) on Boulder City's options for recycling treated effluent water

B. Discussion and staff direction regarding the options provided by the Southern Nevada Water Authority (SNWA) for Boulder City to recycle its treated effluent water

BOULDER CITY
CITY COUNCIL

MAYOR
JOE HARDY

COUNCIL MEMBERS:
COKIE BOOTH
MATT FOX
SHERRI JORGENSEN
STEVE WALTON

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MEETING LOCATION:
CITY COUNCIL CHAMBER
401 CALIFORNIA AVENUE
BOULDER CITY, NV 89005

MAILING ADDRESS:
401 CALIFORNIA AVENUE
BOULDER CITY, NV 89005

WEBPAGE:
WWW.BCNV.ORG

◄ ● ►

CITY MANAGER:
TAYLOUR TEDDER, CECD

CITY ATTORNEY:
BRITTANY LEE WALKER, ESQ

CITY CLERK:
TAMI MCKAY, MMC, CPO

ADMINISTRATIVE SERVICES DIRECTOR:
BRYCE BOLDT

COMMUNITY DEVELOPMENT DIRECTOR:
MICHAEL MAYS, AICP

PUBLIC WORKS DIRECTOR:
JAMIE CURRERI

UTILITIES DIRECTOR:
JOSEPH STUBITZ, P.E.

POLICE CHIEF:
TIM SHEA

FIRE CHIEF:
WILLIAM GRAY, CFO

ACTING FINANCE DIRECTOR:
ANGELA MANNINEN, CFE

PARKS & RECREATION DIRECTOR:
ROGER HALL

City Council Meeting
March 14, 2023
Item No. 8
Staff Report

TO: Taylour Tedder, City Manager

FROM: Joseph Stubitz, Utilities Director

DATE: March 14, 2023

SUBJECT:
Matters pertaining to Boulder City's treated effluent water:

A. Presentation offered by the Southern Nevada Water Authority (SNWA) on Boulder City's options for recycling treated effluent water

B. For possible action: Discussion and staff direction regarding the options provided by the Southern Nevada Water Authority (SNWA) for Boulder City to recycle its treated effluent water

Business Impact Statement:
This action will not have a significant economic impact on business and will not directly restrict the formation, operation, or expansion of a business.

Action Requested:
That City Council receive a presentation from the Southern Nevada Water Authority and discuss the options presented for recycling treated effluent water.

Overview:
•The City of Boulder City and The Southern Nevada Water Authority (SNWA) are discussing an Interlocal Infrastructure Agreement for a project on the Boulder City Wastewater System.
•SNWA provided the city 4 options for the city's effluent water.
•These options include SNWA potentially funding and constructing modifications to Boulder City's existing wastewater treatment facility and water distribution system to enable the delivery and use of reclaimed water. Sending treated wastewater to Henderson's collection system for treatment, sending treated wastewater to Black Mountain Reservoir, or sending treated wastewater to Hoover Dam.

•The Utility Advisory Committee discussed these options during their February 1, 2023, regular meeting and unanimously voted that options 2 and 3 would have the greatest benefit to the city and should be further investigated.

Background Information:
The City of Boulder City and The Southern Nevada Water Authority (SNWA) have discussed an Interlocal Infrastructure Agreement regarding a project for the Boulder City Wastewater System. A draft of the agreement outlines that SNWA could possibly fund and construct modifications to the City of Boulder City's existing wastewater treatment facility and water distribution system to enable the delivery and use of reclaimed water from that facility at the golf courses under Boulder City's management, as well as the City-owned Veterans Memorial Park. Another option exists in which Boulder City would send its treated effluent to Henderson's collection system for treatment and return through the Las Vegas Wash for return flow credits. Other options include sending the city's treated wastewater to Black Mountain Reservoir or sending treated wastewater to Hoover Dam.

During the regular Utility Advisory Committee (UAC) meeting on January 11, 2023, SNWA presented these 4 options for recycling the city's effluent water to the committee. The UAC further discussed these options during their February 1, 2023 regular meeting and voted unanimously that options 2 and 3 would have the greatest benefit to the city and should be further investigated. The committee was also in agreement that options 1 and 4 are not in the city's best interest and should be avoided.

Financial:

Boulder City Strategic Plan Goal:
Goal B: Invest in Infrastructure

Department Recommendation: The Utilities Department recommends that the City Council receive a presentation by the Southern Nevada Water Authority on the options presented for recycling treated effluent water, and hold discussions to guide staff on subsequent action. Subsequent action by SNWA based on City Council direction would be to hire a consultant to do a complete feasibility study for the option or options.

Attachment:
PowerPoint

SOUTHERN NEVADA WATER AUTHORITY®

WASTEWATER ALTERNATIVES

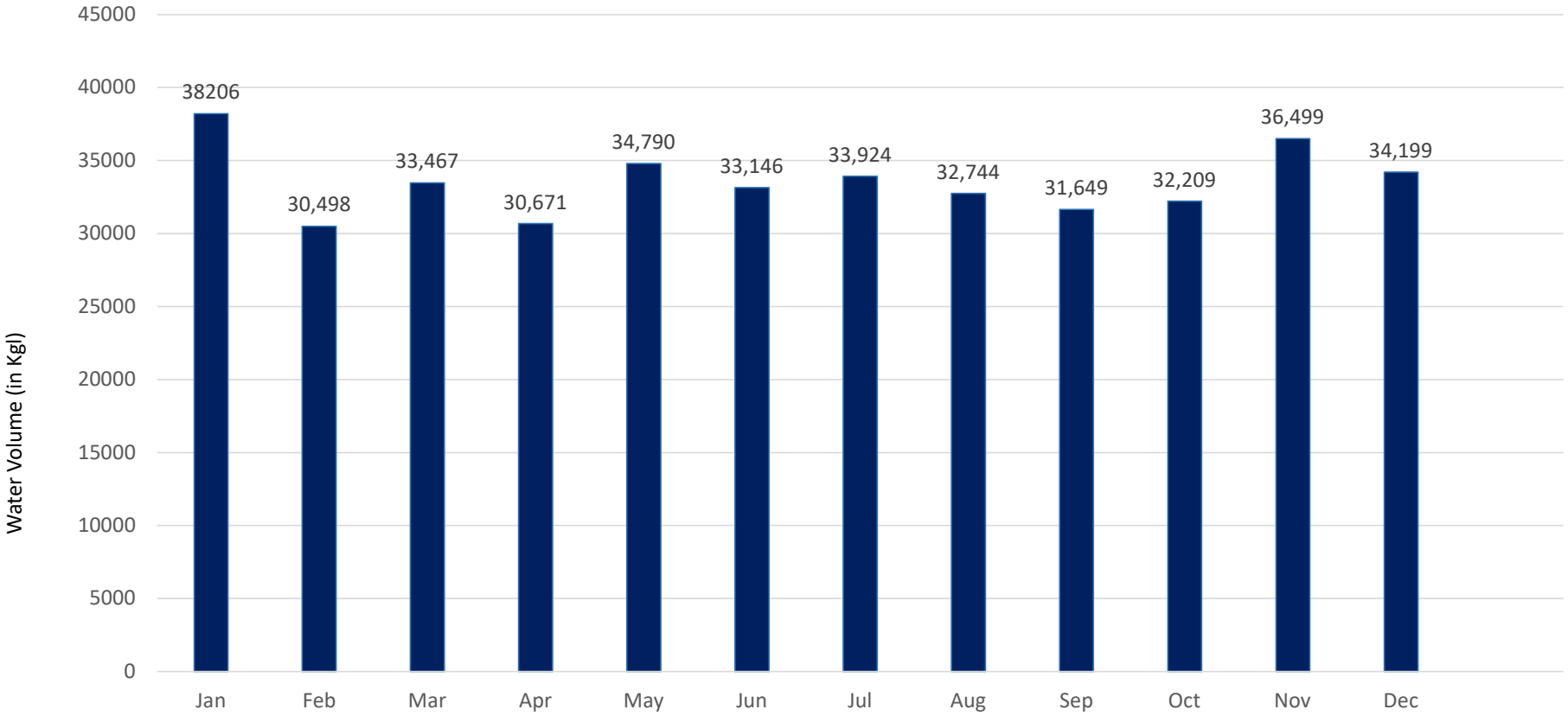
Doa Ross

Deputy General Manager, Engineering

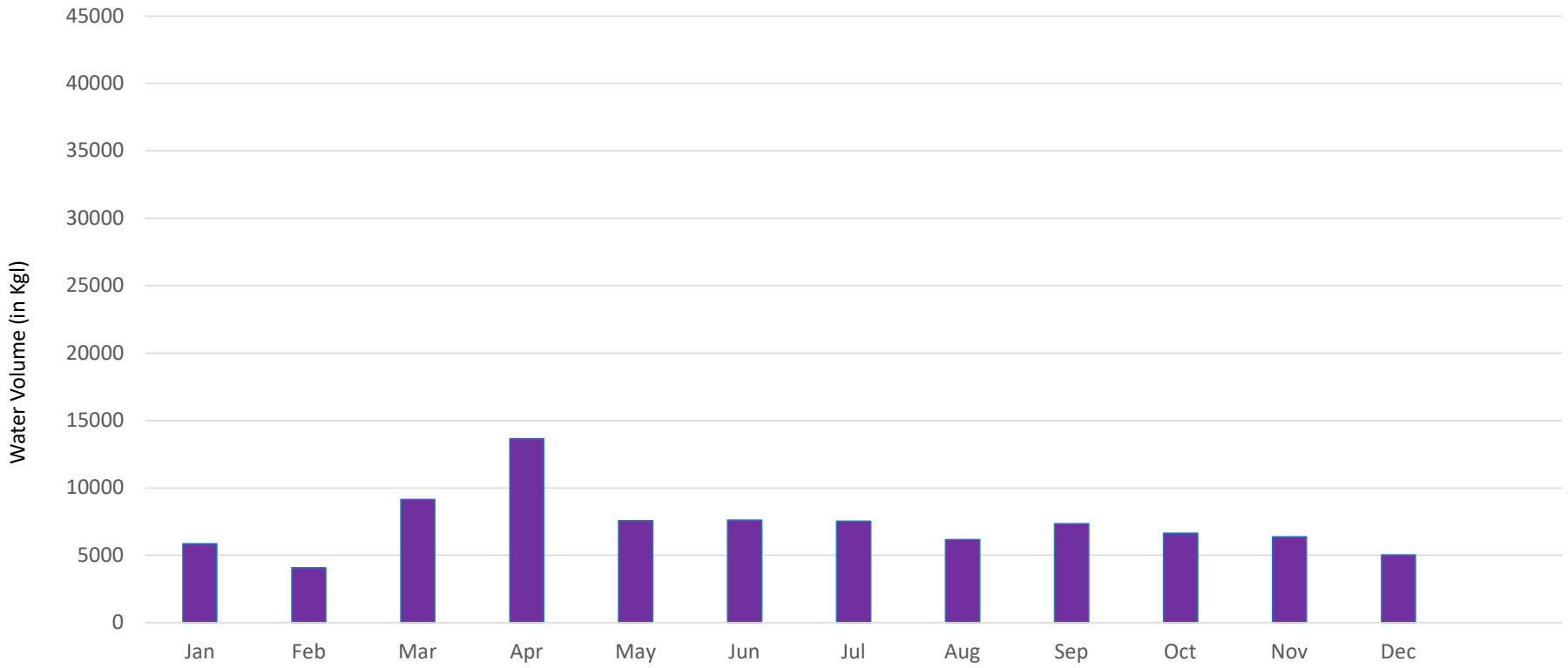
OVERVIEW

- The City of Boulder City currently operates a wastewater treatment facility with an average effluent rate of 33.5 million gallons per month (~1,234 AFY) with low seasonal variability
- The City has a contract with a local quarry operation for an average volume of 7.25 million gallons per month (~267 AFY), which has significant and unpredictable variability
- The remaining volume (~967 AFY) is discharged to evaporation ponds; Boulder City is the only SNWA partner agency whose recovered indoor water does not produce return-flow credits
- The City operates two golf courses irrigated using a combination of raw/potable water; in 2021, Boulder City Golf Course used 313.8 million gallons for irrigation, while Boulder Creek used 419.8 million gallons
- The City also maintains numerous irrigated parks and common spaces, including Veterans Memorial Park, Veterans Cemetary, Bicentennial Park, Hemenway Park and numerous other facilities. All of these properties' irrigation needs are currently met through a raw water distribution system.

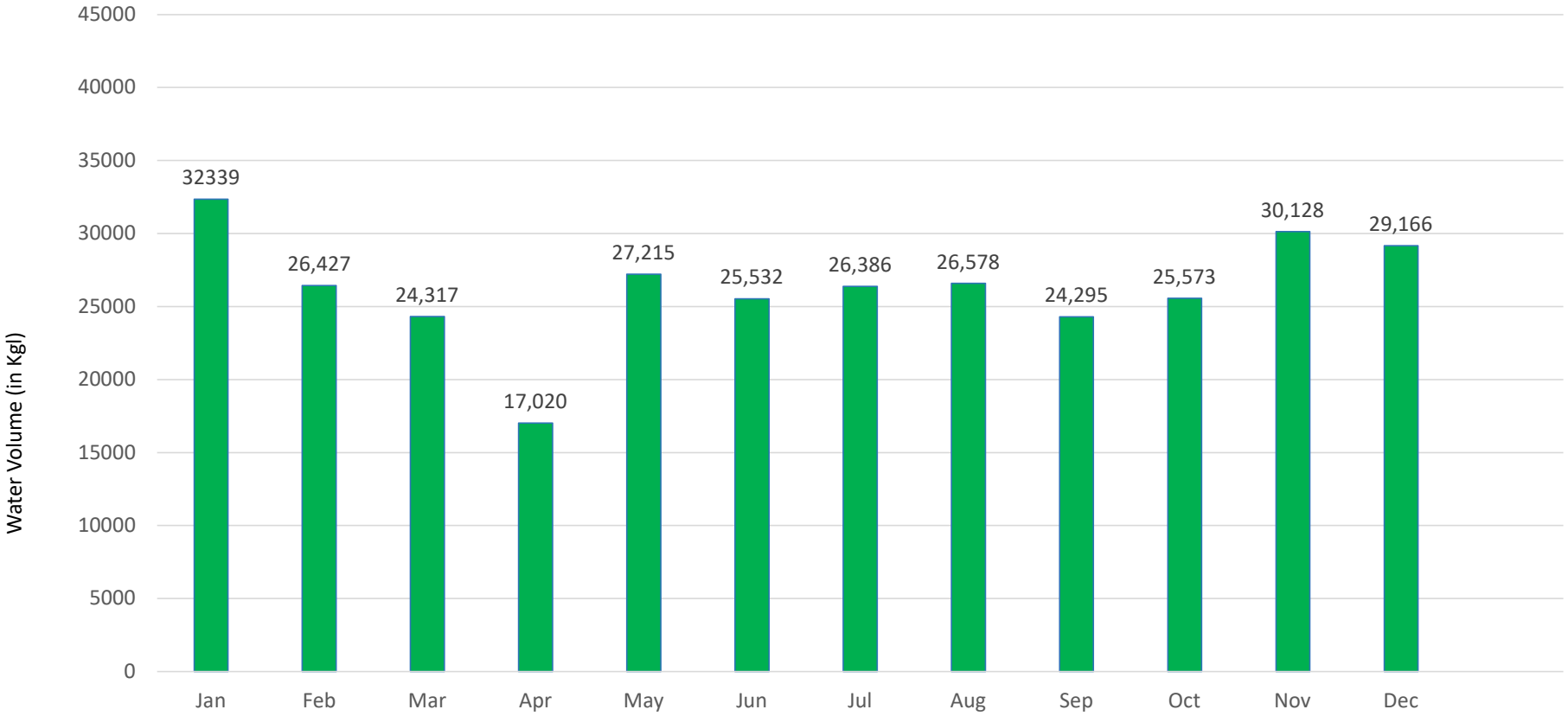
2021 WASTEWATER EFFLUENT (BY MONTH)



2021 TREATED EFFLUENT SALES (BY MONTH)



2021 EFFLUENT BEING EVAPORATED (BY MONTH)



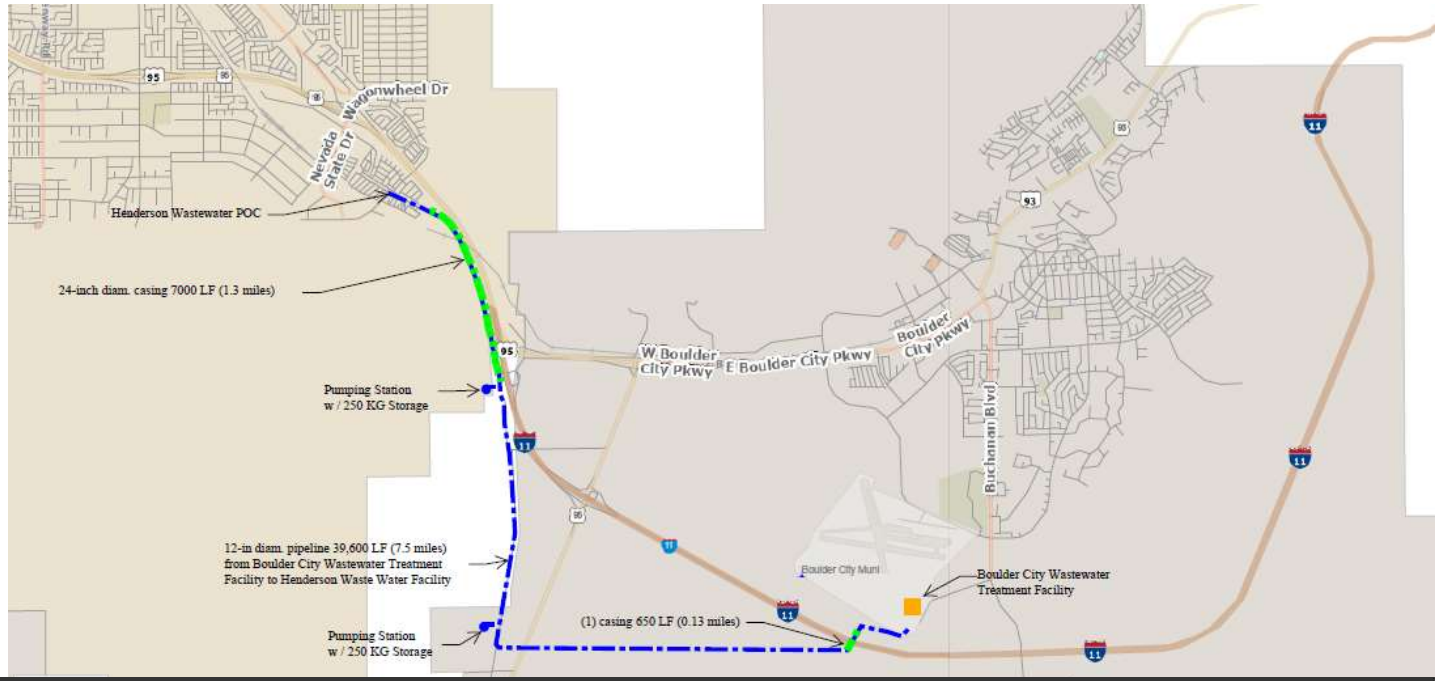
WASTEWATER OPTIONS FOR CONSIDERATION

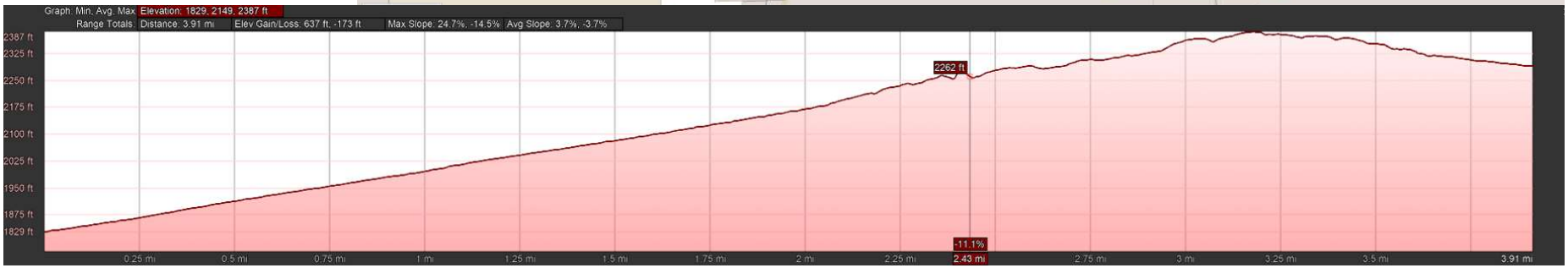
1. Conveyance to Henderson Wastewater Treatment Facility for return-flow credits
2. Direct Reuse for Boulder City Irrigation
3. Return to Lake Mead via recharge well for return flow credits
4. Return-flow credits options with Eldorado Valley opportunity

1 CONVEYANCE TO HENDERSON – DESCRIPTION OF ALTERNATIVE

Key System Components:

- Two Pumping Stations (with 250 Kgl storage each)
- 12” pipeline (estimated ~40,000 LF)
- 24” casing (estimated ~7,000 LF)





1 CONVEYANCE TO HENDERSON – Considerations

- Provides 100 percent utilization of treated effluent
- Requires operating agreement with City of Henderson to treat returned wastewater
- Minimizes operational responsibilities and costs
- Allows potential repurposing of existing raw water distribution network as potable system back-up
- Does not require wastewater treatment plant upgrade/replacement

1 CONVEYANCE TO HENDERSON – Estimated Costs

Cost Summary
Option 1: Convey BC Wastewater to Henderson Wastewater Facility

Proposed Facilities - BC to COH	Size	Cost w/ 50% Contigency
(2) Pumping Stations + (2) 250 KG Storage	1.0 MGD + 250 KG Storage /PS	$ 20,252,000
12-inch diam pipeline 39,600 LF (7.5 miles)	39,600 LF / 12 diam	$ 18,573,000
24-inch diam casing 7,650 LF (1.4 miles)	7,650 LF / 24 in diam.	$ 4,126,000
	Total	**$ 42,951,000**

* Estimate does not include ROW acquisition costs private or public lands

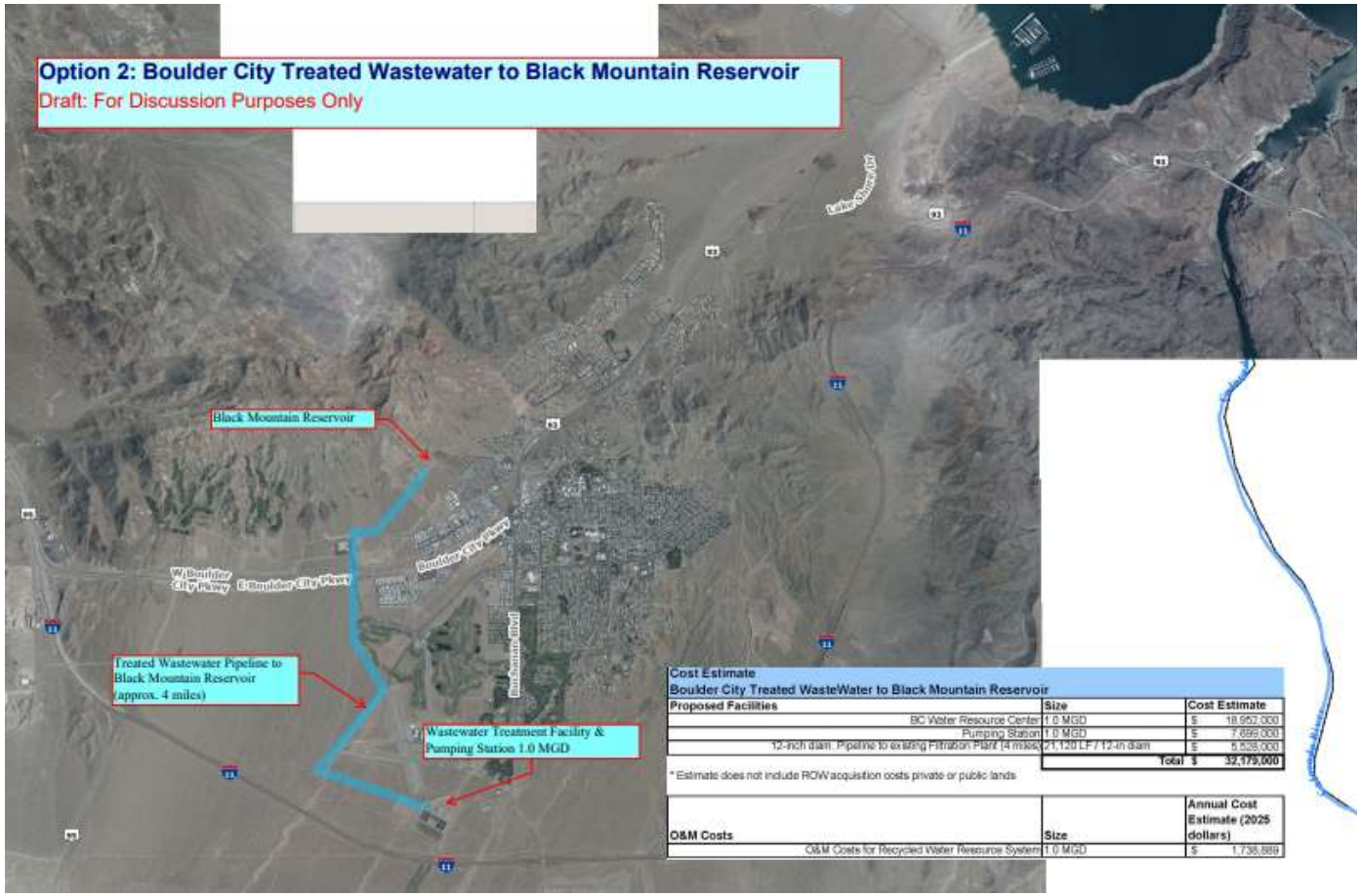
Annual Costs	Size	Annual Cost Estimate
Annual Henderson Processing Fee	1.0 MGD	$ 500,000

Connection charges and an investment in COH capital improvements is estimated to be $20,000,000 more

2 DIRECT REUSE – DESCRIPTION OF ALTERNATIVE

Key System Components:

- Wastewater Treatment Facility and Pumping Station (1 MGD capacity)
- Treated Wastewater Pipeline (~ 21,000 linear feet)



2 DIRECT REUSE FOR IRRIGATION – KEY CONSIDERATIONS

- Provides 100 percent utilization of treated effluent
- Does not require operating agreements with other local municipalities
- Requires wastewater treatment plant upgrade/replacement (improved water quality effluent needed for irrigation)
- Involves repurposing existing raw water line, blending potable and treated wastewater for irrigation
- Allows potential repurposing of existing raw water transmission system as potable system back-up
- Water quality implications of using high TDS treated wastewater during winter require monitoring and management at the end user level

2 DIRECT REUSE – Assumptions

- **Boulder City Golf Course will reduce irrigation usage to 4 af/ac**
  (Combination of warm-season turf utilization and improved irrigation practices; water demand by month will reflect practices for non-overseeded warm-season grasses)

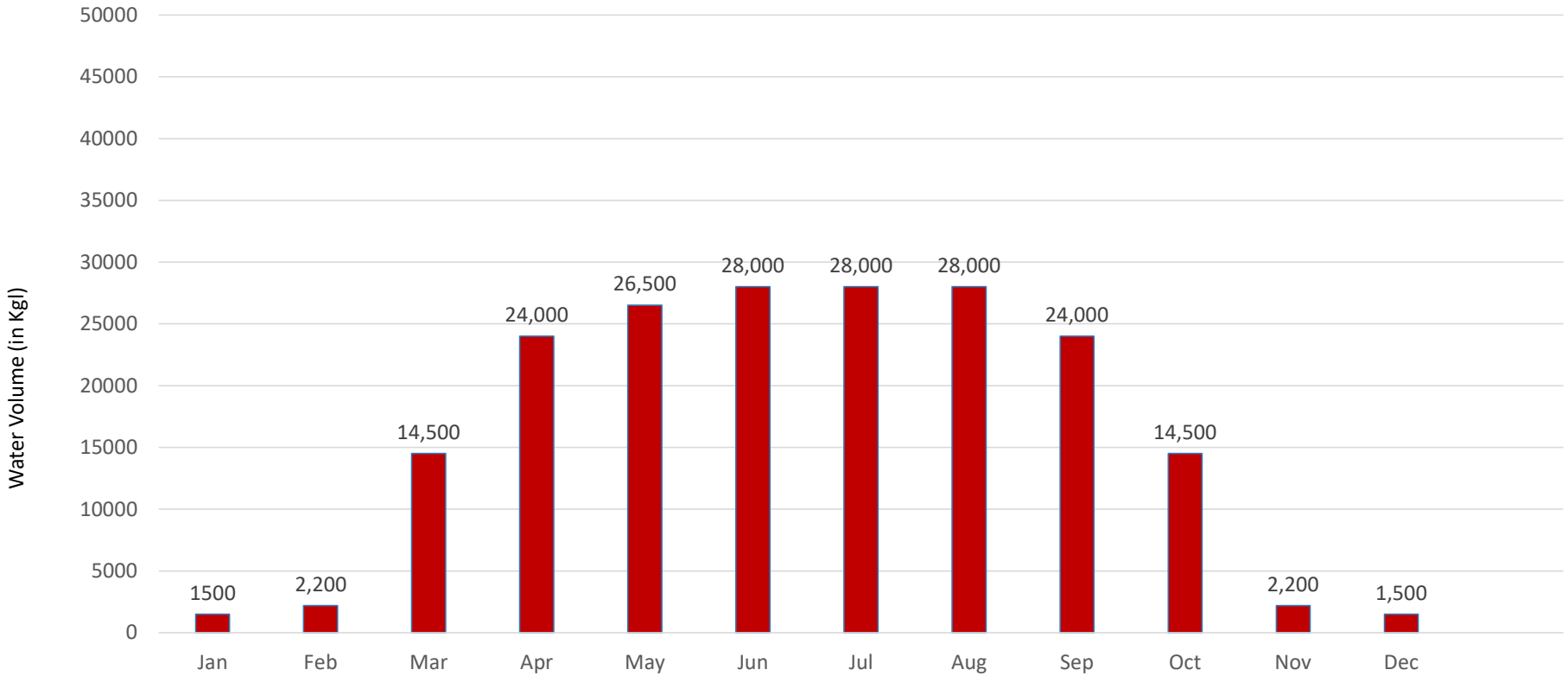
- **Boulder Creek Golf Course will reduce irrigation usage to 4 af/ac**
  (Combination of turf/pond reduction and improved irrigation practices - already warm season with no overseeding)

- **Veteran's Memorial Park and Veteran's Cemetery will reduce water by 20% by the time project is operational**
  (Convert non-functional and marginal grass areas to drip-irrigated landscaping, improve irrigation efficiency, and/or potentially convert turf areas to warm-season varieties)

- **100% of effluent will be used in low-irrigation months**
  The direct reuse option utilizes the entirety of the raw water irrigation network. During shoulder and peak seasons, supplemental raw water will be needed, mitigating water quality issues.

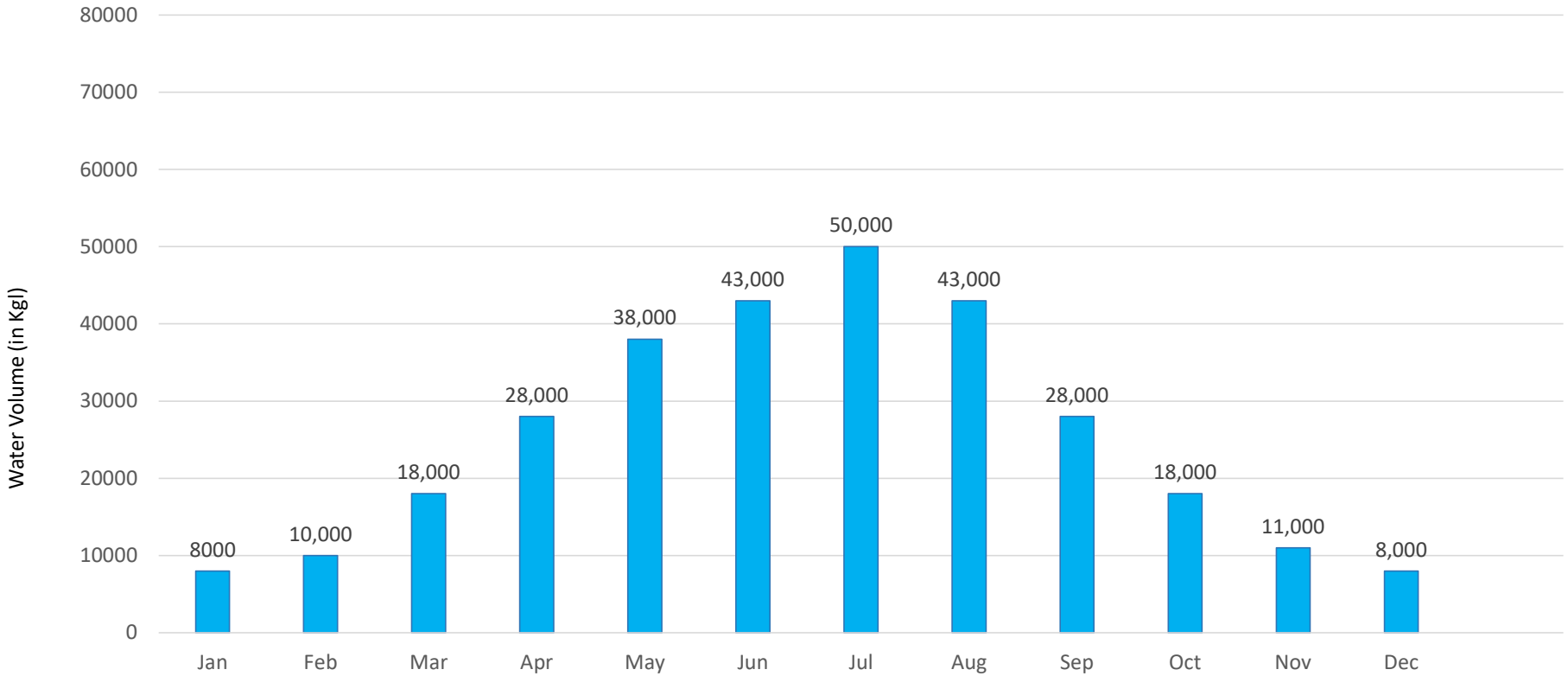
2 BOULDER CITY GOLF COURSE IRRIGATION USAGE (Projected)

Projected at 4 acre feet per acre



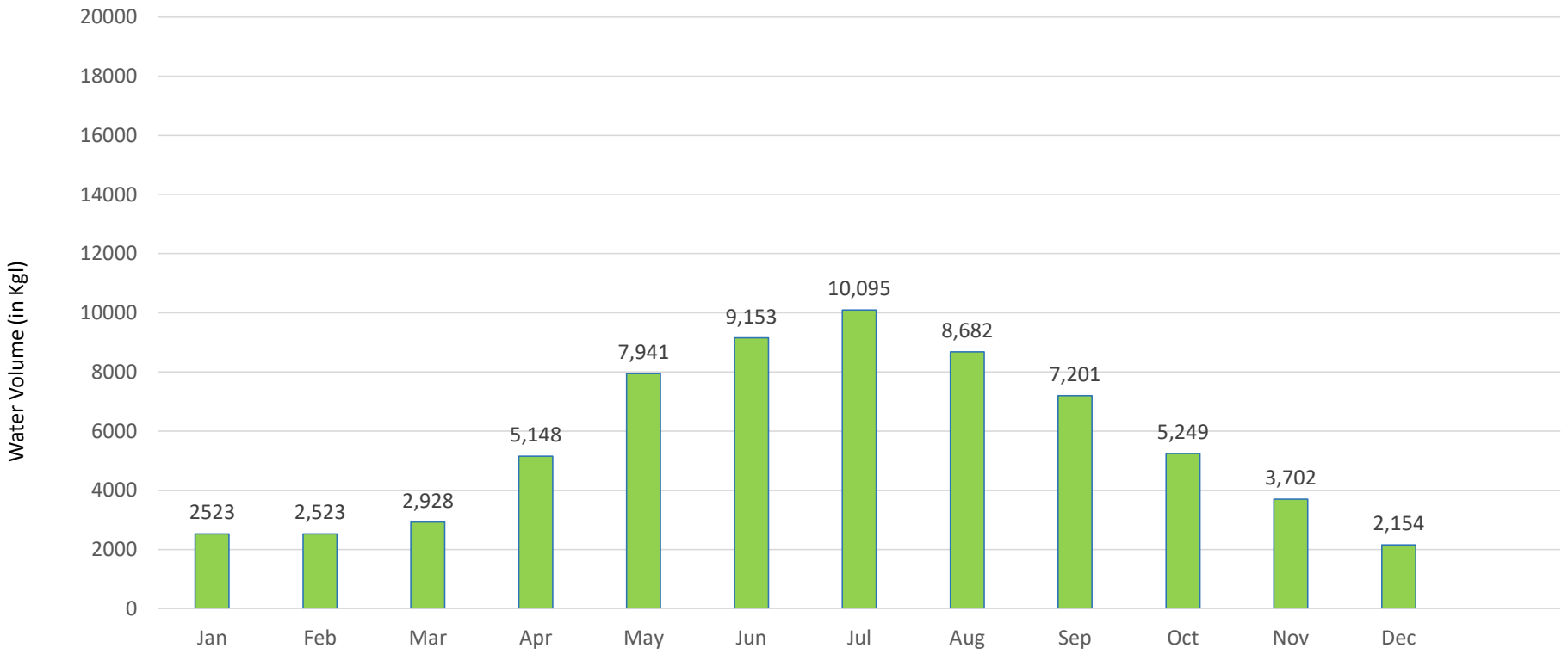
2 BOULDER CREEK GOLF COURSE IRRIGATION USAGE (Projected)

Projected at 4 acre feet per acre



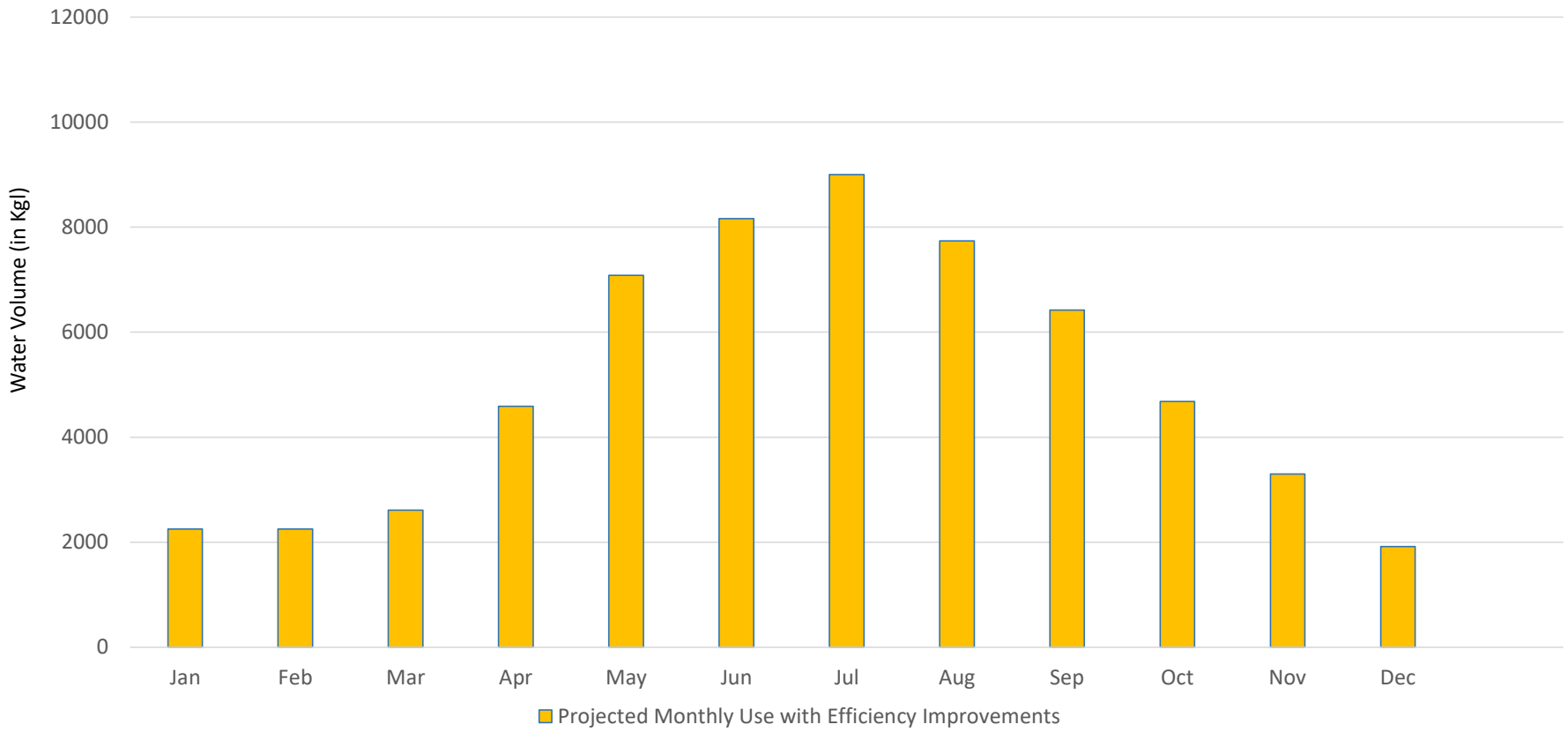
2 VETERAN'S MEMORIAL PARK IRRIGATION USAGE (Projected)

Efficiency improvements assumed

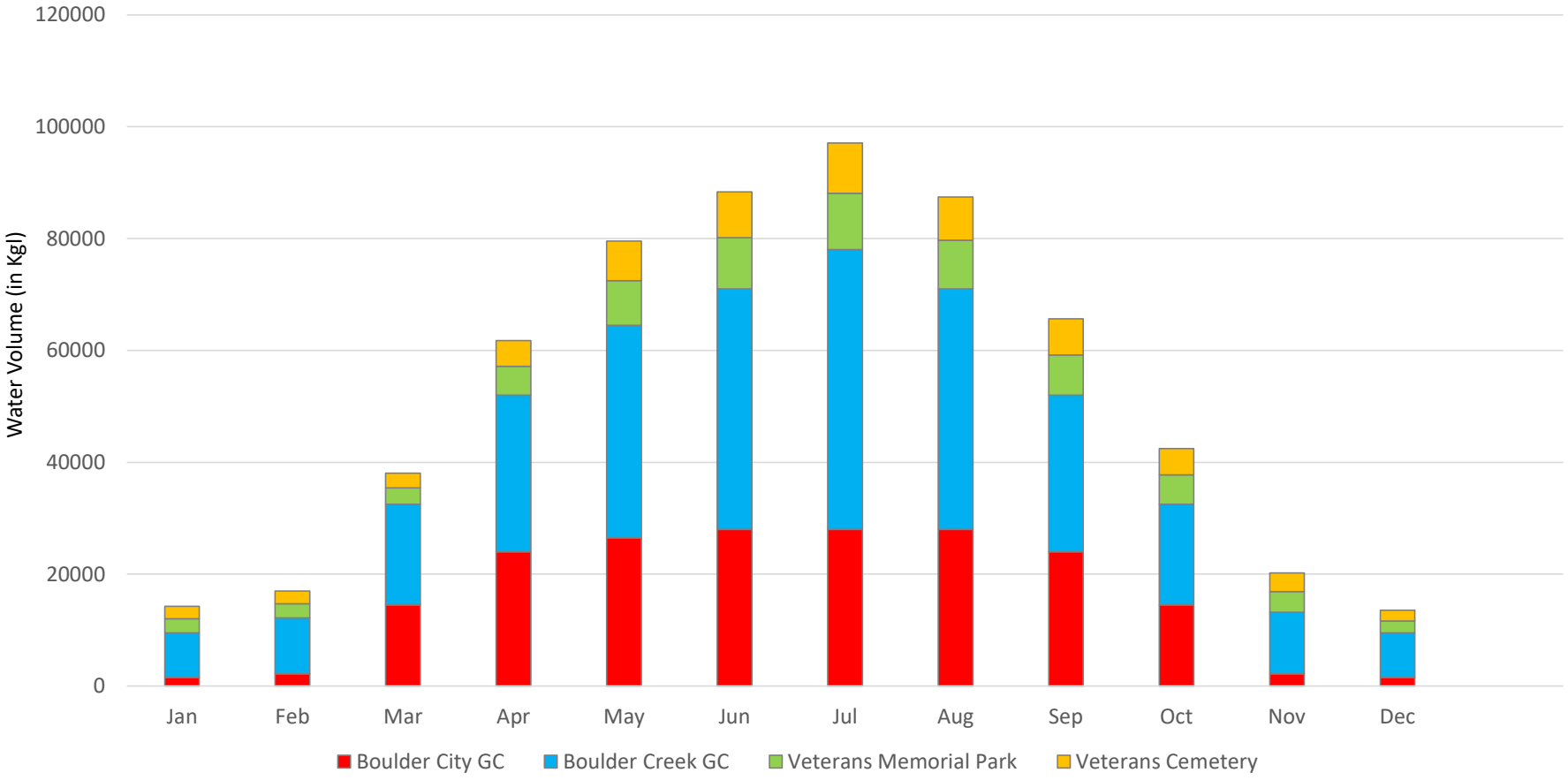


2 VETERAN'S CEMETERY IRRIGATION USAGE (Projected)

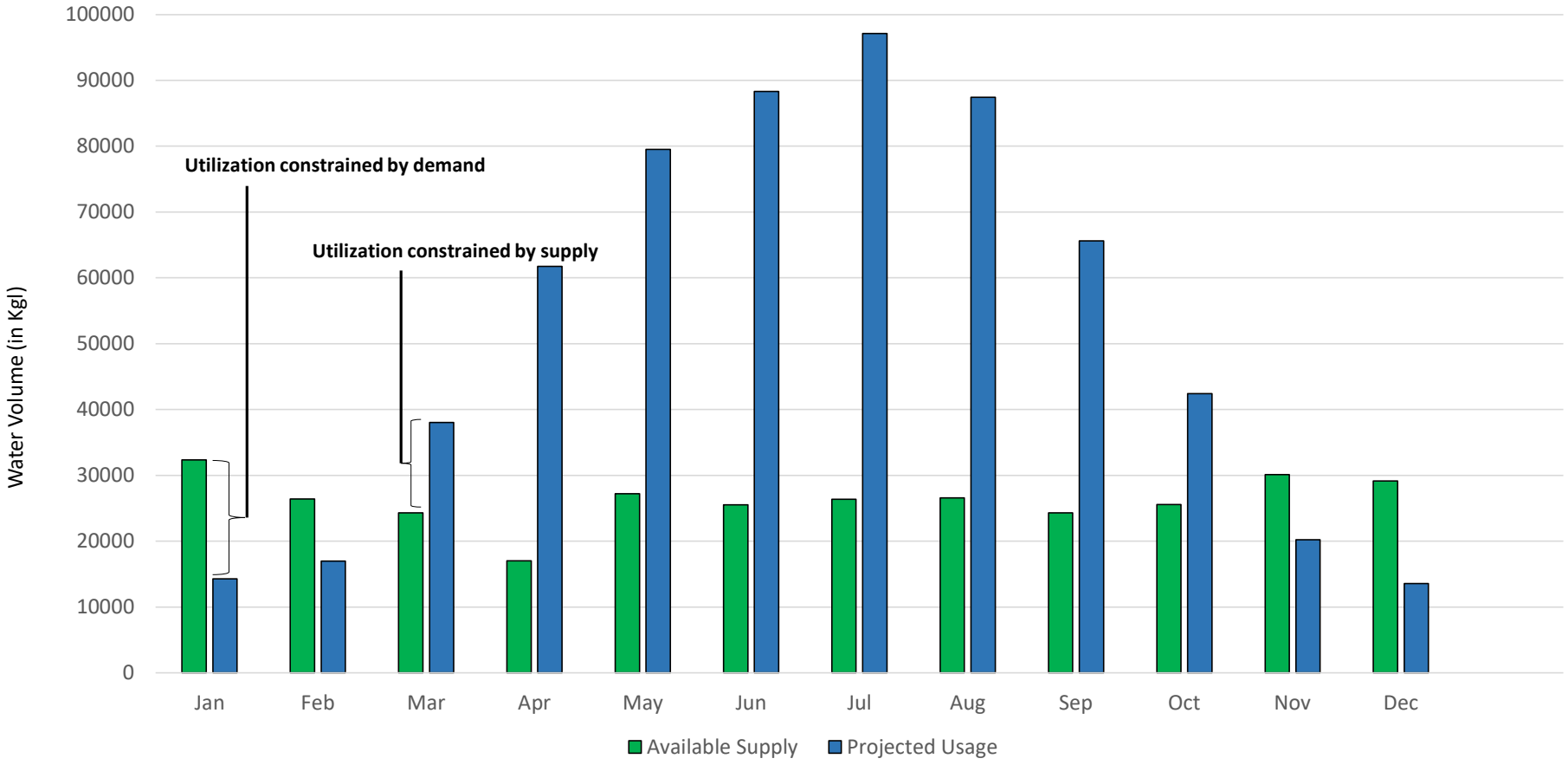
Efficiency improvements assumed



2 COMBINED IRRIGATION USAGE (Projected)



2 COMBINED IRRIGATION DEMAND VS. AVAILABLE EFFLUENT



2 DIRECT REUSE – Estimated Costs

Cost Estimate Boulder City Treated WasteWater to Black Mountain Reservoir		
Proposed Facilities	**Size**	**Cost Estimate**
BC Water Resource Center	1.0 MGD	$ 18,952,000
Pumping Station	1.0 MGD	$ 7,699,000
12-inch diam. Pipeline to existing Filtration Plant (4 miles)	21,120 LF / 12-in diam	$ 5,528,000
	Total	**$ 32,179,000**

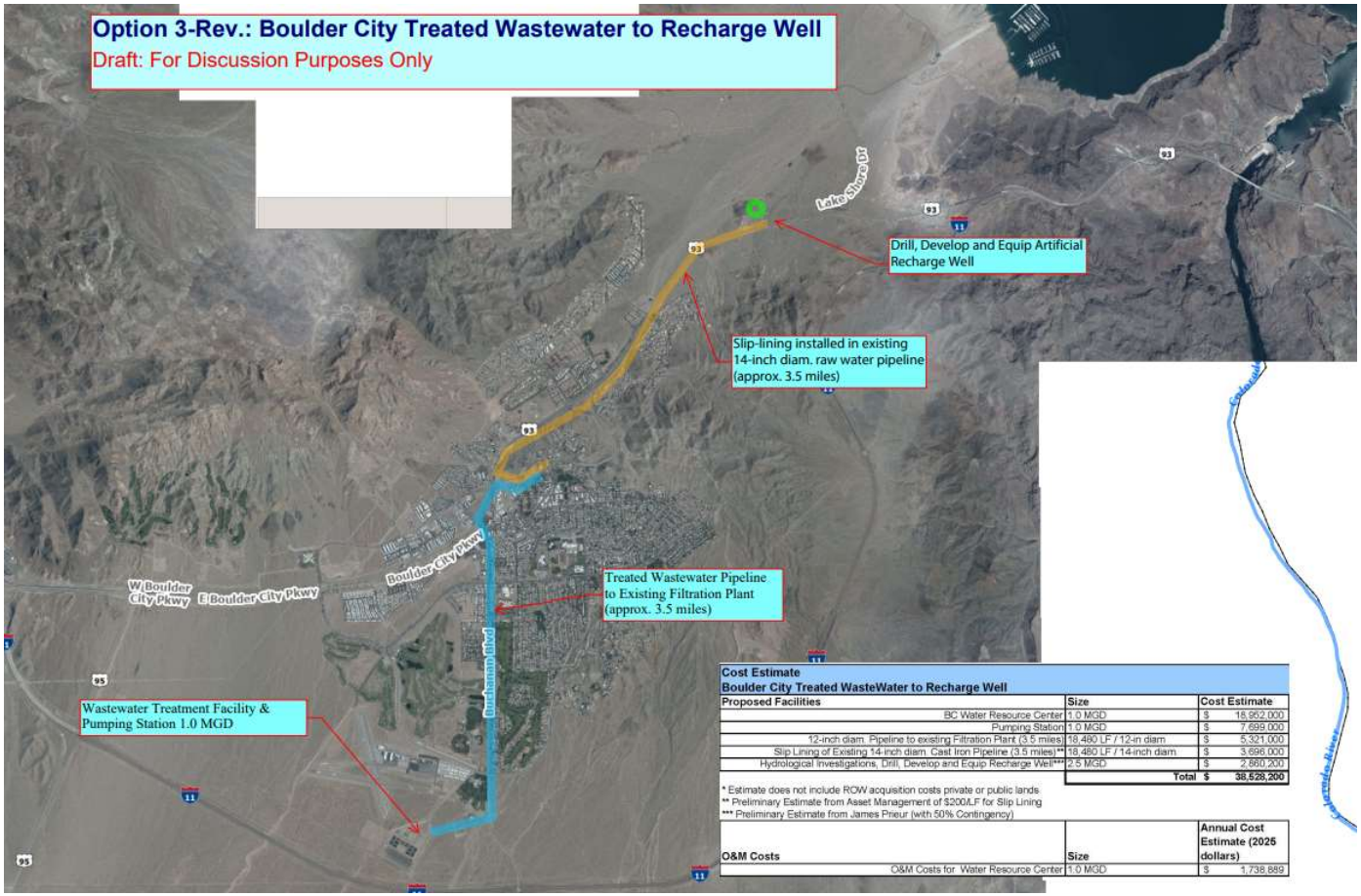
* Estimate does not include ROW acquisition costs private or public lands

O&M Costs	**Size**	**Annual Cost Estimate (2025 dollars)**
O&M Costs for Recycled Water Resource System	1.0 MGD	$ 1,738,889

3 RETURN TO LAKE MEAD VIA RECHARGE WELL

Key System Components:

- Wastewater Treatment Facility and Pumping Station (1 MGD capacity)
- Treated Wastewater Pipeline to existing filtration plant (~18,000 linear feet)
- Installation of lining to existing 14” raw water pipeline (~3.5 miles)
- Artificial Recharge Well



Cost Estimate
Boulder City Treated WasteWater to Recharge Well

Proposed Facilities	Size	Cost Estimate
BC Water Resource Center	1.0 MGD	$ 18,952,000
Pumping Station	1.0 MGD	$ 7,699,000
12-inch diam. Pipeline to existing Filtration Plant (3.5 miles)	18,480 LF / 12-in diam	$ 5,321,000
Slip Lining of Existing 14-inch diam. Cast Iron Pipeline (3.5 miles)**	18,480 LF / 14-inch diam	$ 3,696,000
Hydrological Investigations, Drill, Develop and Equip Recharge Well***	2.5 MGD	$ 2,860,200
	Total	$ 38,528,200

* Estimate does not include ROW acquisition costs private or public lands.
** Preliminary Estimate from Asset Management of $200/LF for Slip Lining
*** Preliminary Estimate from James Prieur (with 50% Contingency)

O&M Costs	Size	Annual Cost Estimate (2025 dollars)
O&M Costs for Water Resource Center	1.0 MGD	$ 1,738,889

3

RETURN TO LAKE MEAD VIA RECHARGE WELL

KEY CONSIDERATIONS

- Provides 100 percent utilization of treated effluent
- Requires wastewater treatment plant upgrade/replacement (improved effluent quality for release)
- Will require special dispensation from Bureau of Reclamation to receive return flow credits
- Allows potential repurposing of existing raw water distribution network as potable system back-up
- Does not require operating agreements with other local municipalities

3

RETURN TO LAKE MEAD VIA RECHARGE WELL

COSTS

Cost Estimate Boulder City Treated WasteWater to Hoover Dam			
Proposed Facilities	**Size**	**Cost Estimate**	
BC Water Resource Center	1.0 MGD	$	18,952,000
Pumping Station	1.0 MGD	$	7,699,000
12-inch diam. Pipeline to existing Filtration Plant (3.5 miles)	18,480 LF / 12-in diam	$	5,321,000
Slip Lining of Existing 14-inch diam. Cast Iron Pipeline (7.0 miles)**	36,960 LF / 14-inch diam.	$	7,392,000
	Total	**$**	**39,364,000**

* Estimate does not include ROW acquisition costs private or public lands
** Preliminary Estimate from Asset Management of $200/LF for Slip Lining

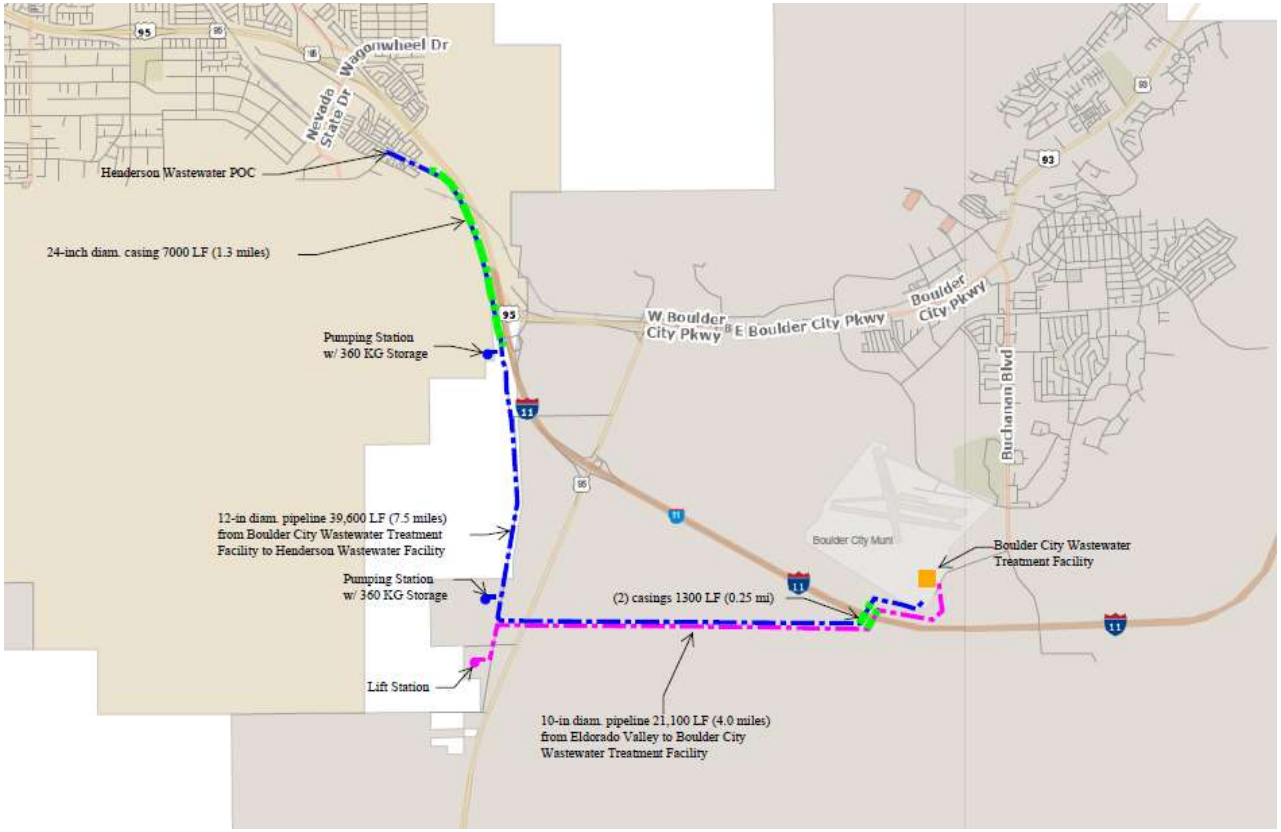
O&M Costs	**Size**	**Annual Cost Estimate (2025 dollars)**	
O&M Costs for Water Resource Center	1.0 MGD	$	1,738,889

4A RETURN TO LAKE MEAD VIA HENDERSON

Eldorado Valley Variation

Key System Components:

- Two Pumping Stations (with 360 Kgl storage each)
- 12” pipeline (estimated ~40,000 linear feet)
- 24” casing (estimated ~7,000 linear feet)
- 10” pipeline (estimated ~21,000 linear feet)
- Lift station conveying wastewater with solids to BC Wastewater Treatment Facility



4A RETURN TO LAKE MEAD VIA HENDERSON - CONSIDERATIONS

Eldorado Valley Variation

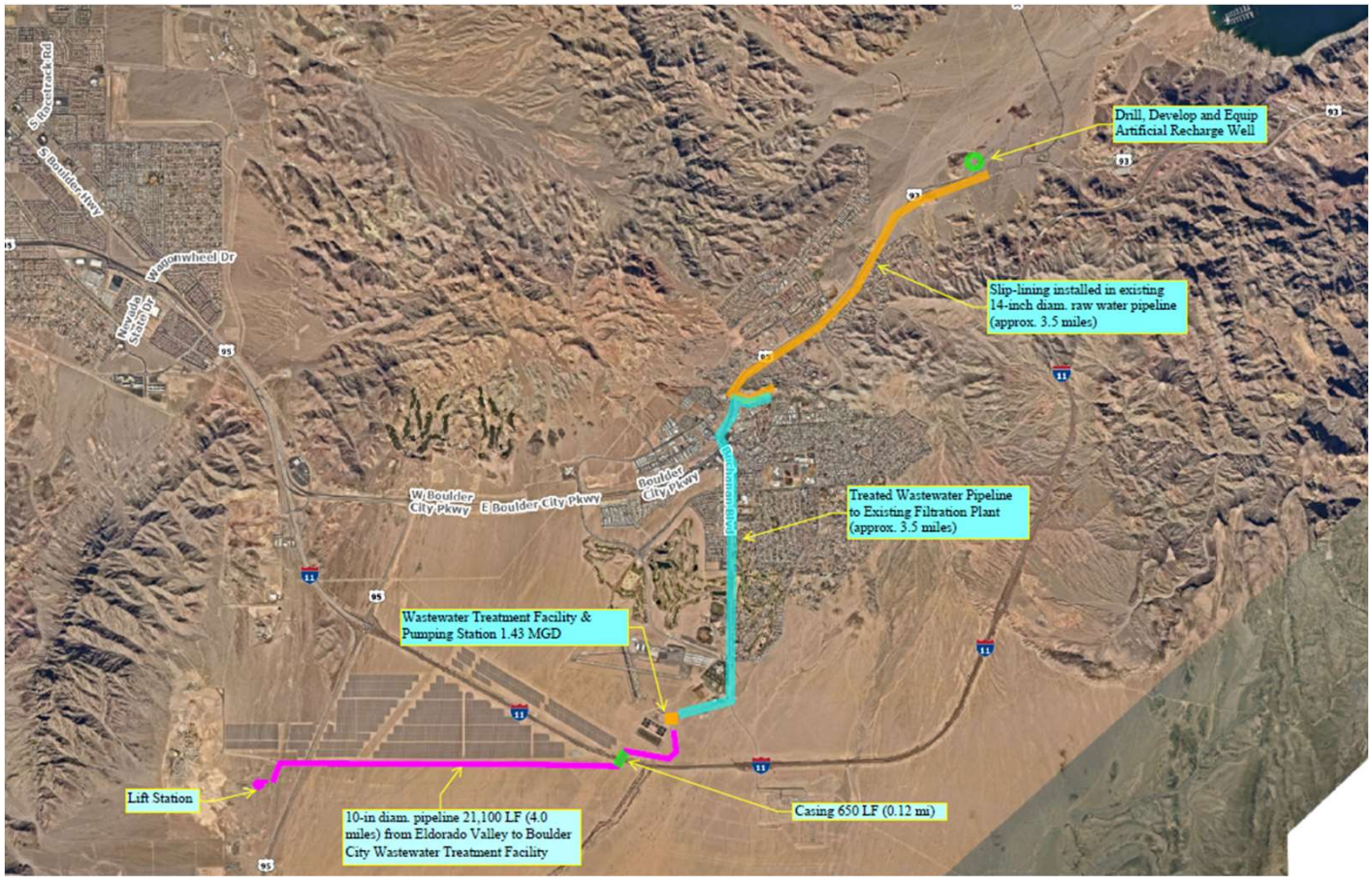
- Provides 100 percent utilization of treated effluent
- Requires operating agreement with City of Henderson to treat returned wastewater
- *By Others: El Dorado Valley would become a customer of Boulder City*
- *By Others: Offset operating costs for treatment due to cost-sharing opportunity*

4B RETURN TO LAKE MEAD VIA RECHARGE WELL - CONSIDERATIONS

Eldorado Valley Variation

Key System Components:

- Wastewater Treatment Facility and Pumping Station (1.4 MGD capacity)
- Treated Wastewater Pipeline to existing filtration plant (~18,000 linear feet)
- Installation of lining to existing 14” raw water pipeline (~3.5 miles)
- Artificial Recharge Well



4B

RETURN TO LAKE MEAD VIA RECHARGE WELL – ELDORADO VALLEY OPTION

KEY CONSIDERATIONS

- Provides 100 percent utilization of treated effluent
- Requires wastewater treatment plant upgrade/replacement (improved effluent quality for release)
- Will require special dispensation from Bureau of Reclamation to receive return flow credits
- Allows potential repurposing of existing raw water distribution network as potable system back-up
- *By Others: El Dorado Valley would become a customer of Boulder City*

NEXT STEPS

- Boulder City Council selects preferred alternative
- SNWA hires a consultant to perform a feasibility study of the Council's preferred alternative
- October: BOR funding announcement (applied for $1 million to support evaluation and feasibility study)
- Upon completion, feasibility study shared with Boulder City Council

QUESTIONS