State of Utah

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF WATER QUALITY
Erica Brown Gaddis, PhD
Director

Utah Water Quality Board Meeting
195 North 1950 West
Via Zoom

Anchor Location: Red Rocks Room 3132
Salt Lake City, UT 84116

January 26, 2022
Board Meeting Begins at 8:30 am

AGENDA

Water Quality Board Meeting – Roll Call

A. Minutes:
Approval of Minutes for December 15, 2021 Water Quality Board Meeting ..... Steven Earley

B. Executive Secretary's Report ..... Erica Gaddis

C. Funding:
1. Financial Report ..... Krystol Carfaro
2. Provo Supplemental Funding Authorization ..... George Meados
3. South Salt Lake City Supplemental Funding Authorization ..... Skyler Davies
4. Millville Refinance & Supplemental Funding Authorization ..... Ken Hoffman/Beth Wondimu
5. Payson City Reauthorization ..... Andrew Pompeo

D. Other
1. Approval Request for Aquifer Classification Petition for Bryce Canyon Area, Garfield County, UT .....Sarah Ward

E. Public Comment Period

F. Meeting Adjournment

Next Meeting February 23, 2022 at 8:30 am
DEQ Board Room 1015
195 North 1950 West
Salt Lake City, UT 84116
Via Zoom

In compliance with the American Disabilities Act, individuals with special needs (including auxiliary communicative aids and services) should contact Larene Wyss, Office of Human resources, at (801) 536-4281, TDD (801) 536-4284, or by email at lwyss@utah.gov at least five working days prior to the scheduled meeting.
Revised 1/21/2022
DWQ-2022-000205

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MINUTES

UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
UTAH WATER QUALITY BOARD

MASOB
and
Via Zoom

December 15, 2021
8:30 am Work Meeting
9:30 am Board Meeting

UTAH WATER QUALITY BOARD MEMBERS PRESENT

Steven Earley	Mike Luers
Brandon Gordon	Kim Shelley
Michela Harris	James Webb
Trevor Heaton	

Excused Emily Niehaus
Joe Havasi

DIVISION OF WATER QUALITY STAFF MEMBERS PRESENT

Emily Cantón	John Mackey
Krystol Carfaro	George Meados
Eric Castrejon	Christine Osborne
Skyler Davies	Winnie Pan
Amy Dickey	Dave Pierson
Judy Etherington	Andrew Pompeo
Erica Gaddis	Jeanne Riley
Jodi Gardberg	Jen Robinson
Clanci Hawks	Jeff Studenka
Samantha Heusser	Sandy Wingert
Ken Hoffman	Beth Wondimu
Brenda Johnson	Yan Yan
Glen Lischeske	

OTHERS PRESENT

Chris Otto	DEQ
Jay Olsen	UDAF
Søren Simonson	Jordan River Commission
Daniel Hawley	Jones & DeMille
Derek Holmsted	Jones & DeMille
Joseph Ozimek	McWane Ductile
Sullivan Love	Vineyard City
Juan Garrido	Lindon City
Jeffren Pei	Hanksville City
Carley Castle	Upcoming WQB Member

Mr. Earley called the Work Meeting to order at 8:30 AM.

Introduction to the Watershed Protection Section: Ms. Gardberg introduced the Watershed Protection Section to the Board members.

Financial Burden Criteria: Mr. Hoffman presented the Board members with the Financial Burden Evaluation Policy for the Utah Wastewater Project Assistance Program.

ROLL CALL

Mr. Earley took roll call for the members of the Board and audience.

APPROVAL OF MINUTES OF OCTOBER 27, 2021 BOARD MEETING

Motion: Mr. Gordon moved to approve the minutes of the October 27, 2021 Board meeting.

Mr. Webb seconded the motion. The motion passed unanimously.

EXECUTIVE SECRETARY REPORT

Dr. Gaddis addressed the Board with the following updates.

National

- Infrastructure Bill
  - Estimated $66 million over next 5 years, with an additional State match of $10 million
    - $6.8 million for storm water
    - $4.7 million for emerging contaminants
    - 49% principal forgiveness
    - 12% for disadvantaged communities
  - Additional funds possible

  - New buy American requirements
  - Coordination with DNR for competitive grants
  - Schedule Finance Committee Meeting for January
- American Rescue Plan Act (ARPA) Funds
  - $3 million – Mountain Green wastewater project
  - $3 million – Heber City water and sewer project
  - $2 million – Salt Lake City stormwater project
  - $4 million – West Jordan water and sewer project
  - $26,000 – Hanksville sewer lagoon repair
  - $1 million – Weber River watershed restoration
  - $175,000 – San Rafael Energy Research Center new sewer line
- ARPA Funds - Governor's Budget
  - $25 million – Utah Lake preservation
  - $45 million – Great Salt Lake through DNR
  - $100 million – local matching grant program to Governor's Office of Planning & Budget (GOPB)
  - $50 million – Ag Water optimization
- Waters Of The US (WOTUS)
  - Remanded and vacated in August 2021. Two anticipated rulemakings; a foundational rule to restore longstanding protections and an anticipated second rule that builds on that regulatory foundation.

State

- Utah Lake Authority bill

Water Quality Core Program Updates

- Total Maximum Daily Loads (TMDL)
  - Spring Creek TMDL public notice
- Integrated Report out for public comment
- Individual Permitting
  - Lisbon Valley Mining Company Permit at public comment
    - Hearing Officer needed on January 19, 2022 from 6:00 – 8:30 pm
- General Permitting
  - Treated groundwater permit at public comment
  - Pesticide general permit at public comment
- Incident Response
  - Citation Oil spill near Escalante

Water Quality Board

- Carly Castle will be confirmed on December 16, 2021.

Division Management

- Staff Vacancies
  - Environmental Scientists

- Assistant Director

FUNDING REQUESTS

Financial Report: Ms. Carfaro updated the Water Quality Board on the Loan Funds and Hardship Grant Funds as indicated in the packet.

Hanksville Planning Advance : Mr. Meados presented the Water Quality Board with a hardship planning advance request from Hanksville Town.

Motion: Mr. Luers moved to approve the staff recommendations of a planning advance in the amount of $36,600 with the following special conditions.

1. **The Division of Water Quality must approve the engineering agreement and plan of study before the advance will be executed.**
2. **The Design Advance must be expeditiously repaid to the Board once long-term project financing has been secured.**
3. **The City must agree to participate annually in the Municipal Wastewater Planning Program (MWPP).**
4. **As part of the facility planning, the City must complete a Water Conservation and Management Plan.**

Mr. Gordon seconded the motion. The motion passed unanimously.

RULE MAKING

Request to Adopt R317-1-7 Spring Creek (Heber) *E. coli* Total Maximum Daily Load (TMDL) Study: Ms. Wingert requested that the Board adopt the Spring Creek (Heber) *E. coli* TMDL into R317-1-7.

Motion: Mr. Luers moved to approve the staff recommendations of adoption of the Spring Creek (Heber) *E. coli* Total Maximum Daily Load (TMDL) into R317-1-7.

Ms. Harris seconded the motion. The motion passed unanimously.

OTHER

Sinclair Trucking Company Notice of Violation Settlement: Ms. Heusser presented the Board with a proposed Settlement Agreement in the amount of $29,455.00.

The terms of the financial settlement are as follows:

Total Civil Penalty	$25,667.00
Administrative Cost Reimbursement to DWQ	$3,788.00
Total Settlement	**$29,455.00**

Motion: Mr. Webb moved to approve the Sinclair Trucking Company Notice of Violation Total Settlement amount of $29,455.00

Mr. Heaton seconded the motion. The motion passed unanimously.

PUBLIC COMMENTS
No public comments.

MEETING ADJOURNMENT
Motion: **Ms. Harris moved to adjourn the meeting.**

Mr. Gordon seconded the motion. The motion passed unanimously.

To view the full recording of the Water Quality Board meeting.
https://deq.utah.gov/boards/utah-water-quality-board-meetings

Next Meeting – January 26, 2022
Meeting begins at 8:30 am

In-Person
MASOB
195 North 1950 West
Board Room 1015
Salt Lake City, UT 84116

Via Zoom
https://us02web.zoom.us/j/7074990271

Steven Earley, Chair
Utah Water Quality Board

DWQ-2021-0033722

LOAN FUNDS FINANCIAL STATUS REPORT JANUARY 2022

STATE REVOLVING FUND (SRF)	State Fiscal Year 2022	State Fiscal Year 2023	State Fiscal Year 2024	State Fiscal Year 2025	State Fiscal Year 2026	State Fiscal Year 2027
Funds Available						
Capitalization Grants Awards (FFY19 - 21)	$22,092,801	$0	$0	$0	$0	$0
State Match (FFY20 - 21)	$3,343,000	$0	$0	$0	$0	$0
Future Capitalization Grants (estimated)	$8,000,000	$8,000,000	$8,000,000	$8,000,000	$8,000,000	$8,000,000
Future State Match (estimated)	$1,600,000	$1,600,000	$1,600,000	$1,600,000	$1,600,000	$1,600,000
SRF - 2nd Round	$46,000,156	$12,447,822	-$625,117	-$3,424,369	$26,340,221	$56,167,622
Interest Earnings at 0.4252%	$97,796	$52,928	$0	$0	$111,999	$238,825
Loan Repayments (5255)	$7,450,069	$17,484,132	$20,400,749	$20,164,590	$20,115,402	$18,678,941
Total Funds Available	$88,583,822	$39,584,883	$29,375,631	$26,340,221	$56,167,622	$84,685,388
Project Obligations						
Central Valley Water Reclamation Facility	(15,300,000)	(6,800,000)	-	-	-	-
Duchesne City		-	-	-	-	-
Moab City	(80,000)	-	-	-	-	-
Provo City	(34,045,000)	(20,000,000)	(8,800,000)	-	-	-
South Salt Lake City (A)	(2,290,000)	(234,000)	-	-	-	-
Millville City	(1,150,000)	-	-	-	-	-
Loan Authorizations						
South Davis Sewer District (with NPS)	(7,000,000)	(7,176,000)			-	-
Mountain Green	(1,500,000)	(4,000,000)	(1,500,000)			
Payson City		(2,000,000)	(9,500,000)			
Millville	(3,000,000)					
Planned Projects						
*Millville	(5,011,000)					
*Provo Additional Funding	(5,000,000)		(10,000,000)			
*Payson City Reauthorization			(3,000,000)			
*South Salt Lake City Additional Funding	(1,760,000)					
Total Obligations	(76,136,000)	(40,210,000)	(32,800,000)	-	-	-
SRF Unobligated Funds	$ 12,447,822	$ (625,117)	$ (3,424,369)	$ 26,340,221	$ 56,167,622	$ 84,685,388

UTAH WASTEWATER LOAN FUND (UWLF)	State Fiscal Year 2022	State Fiscal Year 2023	State Fiscal Year 2024	State Fiscal Year 2025	State Fiscal Year 2026	State Fiscal Year 2027
Funds Available						
UWLF	23,905,044	14,917,689	11,457,576	14,254,267	17,385,402	20,363,655
Sales Tax Revenue	-	3,587,500	3,587,500	3,587,500	3,587,500	3,587,500
Loan Repayments (5260)	931,944	2,495,988	2,473,791	2,808,235	2,655,353	2,270,341
Total Funds Available	24,836,989	21,001,176	17,518,867	20,650,002	23,628,255	26,221,497
General Obligations						
State Match Transfers	(4,943,000)	(1,600,000)	(1,600,000)	(1,600,000)	(1,600,000)	(1,600,000)
DWQ Administrative Expenses	(832,300)	(1,664,600)	(1,664,600)	(1,664,600)	(1,664,600)	(1,664,600)
Project Obligations						
South Salt Lake City (B)	(3,112,000)	(1,779,000)	-	-	-	-

*WQB Agenda Items

LOAN FUNDS FINANCIAL STATUS REPORT JANUARY 2022

Loan Authorizations						
Spanish Fork	-	(4,500,000)	-	-	-	-
Planned Projects						
*South Salt Lake	(1,032,000)	-	-	-	-	-
Total Obligations	(9,919,300)	(9,543,600)	(3,264,600)	(3,264,600)	(3,264,600)	(3,264,600)
UWLF Unobligated Funds	$ 14,917,689	$ 11,457,576	$ 14,254,267	$ 17,385,402	$ 20,363,655	$ 22,956,897
Total Loan Fund Balance	27,365,511	10,832,459	10,829,899	43,725,623	76,531,278	107,642,285
Project Reserve		(5,000,000)	(10,000,000)	(15,000,000)	(20,000,000)	(25,000,000)
Total Available Loan Funds	**27,365,511**	**5,832,459**	**829,899**	**28,725,623**	**56,531,278**	**82,642,285**

*WQB Agenda Items

HARDSHIP GRANT FUNDS FINANCIAL STATUS REPORT JANUARY 2022

HARDSHIP GRANT FUNDS (HGF)	State Fiscal Year 2022	State Fiscal Year 2023	State Fiscal Year 2024	State Fiscal Year 2025	State Fiscal Year 2026	State Fiscal Year 2027
Funds Available						
Beginning Balance		1,837,144	2,083,977	2,469,117	2,769,484	2,885,204
Federal HGF Beginning Balance (5250)	4,019,994	-	-	-	-	-
State HGF Beginning Balance (5265)	2,508,761	-	-	-	-	-
Interest Earnings at 0.4252%	13,880	7,812	8,861	10,499	11,776	12,268
UWLF Interest Earnings at 0.4252%	50,822	72,206	57,494	69,385	82,699	95,362
Hardship Grant Assessments (5255)	424,820	1,097,077	1,021,544	945,012	767,302	690,077
Interest Payments - (5260)	93,310	319,738	297,241	275,471	253,943	232,597
Advance Repayments	-	-	-	-	-	-
Total Funds Available	7,111,587	3,333,977	3,469,117	3,769,484	3,885,204	3,915,508
Financial Assistance Project Obligations						
Eagle Mountain City - Construction Grant	(510,000)	-	-	-	-	-
Emigration Sewer Imp Dist - Planning Grant	(26,158)	-	-	-	-	-
Kane Co Water Conservancy Dist (Duck Creek) - Hardship Grant		-	-	-	-	-
Lewiston City - Design and Construction	(274,000)	-	-	-	-	-
Millville City - Design and Construction	(1,000,000)					
Mount Pleasant Planning Advance	(50,000)					
Spanish Fork - Hardship Grant	(250,000)	(250,000)	-	-	-	-
Salina Design Advance	(400,000)					
Hanksville Planning Advance	(36,600)					
Non-Point Source/Hardship Grant Obligations						
Fitzgerald ARDL interest-rate buy down	(51,056)	-	-	-	-	-
McKees ARDL interest-rate buy down	(55,261)	-	-	-	-	-
Munk Dairy ARDL interest-rate buy down	(16,017)	-	-	-	-	-
(FY12) Utah Department of Agriculture	(213,233)	-	-	-	-	-
(FY15) DEQ - Ammonia Criteria Study	(27,242)	-	-	-	-	-
(FY17) DEQ - Utah Lake Water Quality Study	(348,301)	-	-	-	-	-
(FY20) Wasatch Co Health Dept Ground WQ Study	(8,270)					
USU - Historic Trophic State/Nutrient Concentrations Paleo	(84,629)	-	-	-	-	-
FY 2018 - Remaining Payments	(7,100)	-	-	-	-	-
FY 2019 - Remaining Payments	(111,419)	-	-	-	-	-
FY 2020 - Remaining Payments	(394,138)	-	-	-	-	-
FY 2021 - Remaining Payments	(334,977)					
FY 2022 - Remaining Payments	(918,042)					
Future NPS Annual Allocations		(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)
Planned Projects						
*Milliville	(158,000)					
Total Obligations	(5,274,443)	(1,250,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)
HGF Unobligated Funds	$ 1,837,144	$ 2,083,977	$ 2,469,117	$ 2,769,484	$ 2,885,204	$ 2,915,508

*WQB Agenda Items

State of Utah
Wastewater Project Assistance Program
Project Priority List

As of January 20, 2022

Rank	Project Name	Funding Authorized	Total Points	Point Categories			
				Project Need	Potential Improvement	Population Affected	Special Consideration
1	Provo City	R	144	50	24	10	60
2	South Salt Lake City (CVWRF)	R	143	50	23	10	60
3	South Davis Sewer District	X	138	50	18	10	60
4	Payson	R	120	35	17	8	60
5	Spanish Fork Water Reclamation Facility	X	117	50	19	8	40
6	Millville City	R	114	45	46	3	20
7	Mountain Green	X	108	50	14	4	40
8	Lewiston City	X	67	10	16	1	40

X - funding authorized; R - Additional Funding Requested; 0 - Funding Not Yet Authorized

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TO: Water Quality Board

THROUGH: Erica Brown Gaddis, PhD

FROM: George Meados

DATE: January 26, 2022

SUBJECT: Provo Membrane Bioreactors Project

At the December 3, 2018 Utah Water Quality Board (Board) meeting, Provo City requested $120 million in funding assistance with a local contribution of $30 million to construct Phase 1 of 2 of a $240 million overall project. The staff feasibility report that was provided to the Board at that time with a request for loan authorization is included in Attachment 2 for reference. During the December 2018 meeting the Board authorized a $77.8 million loan, including $2 million in principal forgiveness, with an interest rate of 0.5% and a term of 20 years. The initial loan of $77.8 million covered the price of materials and labor when it was approved in 2018. Since that approval, prices have steadily increased and now the City is requesting additional financial assistance to complete the project as it was originally intended. The City also applied to the State's $50 million ARPA matching program, but was unsuccessful.

APPLICANT'S REQUEST

Provo City is requesting $20,000,000 in additional funding to construct new aeration basins for the membrane bioreactors to enable the facility to biological remove phosphorus and nitrogen. If additional funding is not received, Provo City will utilize the existing aeration basins and retrofit them to have anaerobic zones for phosphorus removal and aeration.

PROJECT NEED

Provo currently discharges to Mill Race which flows to Provo Bay in Utah Lake. Utah Lake is listed on the 2016 Integrated Report: Lakes and Reservoirs 305(b) and 303(d) for harmful algal blooms, total dissolved solids, total phosphorus, and PCB in fish tissue. Provo Bay is listed for pH, total phosphorus, total ammonia and PCB in fish tissue. The improvement in effluent water quality from this project will significantly improve the water quality discharged from the reclamation facility and in turn the water quality of Provo Bay and Utah Lake.

PROJECT DESCRIPTION

See Page 2 of the attached Authorization Report.

POSITION ON PROJECT PRIORITY LIST

Provo City is currently ranked No. **1** of 8 on the FY 2021 Wastewater Treatment Project Priority List (PPL).

APPLICANT'S CURRENT USER CHARGE

Currently, Provo City charges approximately $75.75 per month per ERU. Provo has increased user rates annually since 2015 and changed the rate structure to charge by volumetric unit. Provo is increasing rates not only for this current project but to reach a pay as you go model for future projects which are planned as part of Phase 2. The impact fee is $2,371.

COST ESTIMATE

The total cost of the project is estimated to be $139,533,000. A breakdown of these costs is as follows.

Legal/Bonding	$	50,000
DWQ Loan Origination Fee	$	883,000
Engineering - Design	$	4,900,000
Engineering - CMS	$	7,200,000
Construction	$	115,000,000
Contingency (10%)	$	11,500,000
Total Project Cost:	**$**	**139,533,000**

ESTIMATED ANNUAL COST FOR SEWER SERVICE

Different funding options result in different annual sewer costs. A cost model is shown in Attachment 1, which analyzes several possible funding options. With the new project cost, the previous Board authorized loan of $77,800,000, and the City funding the remaining needs on the private market or through a pay as you go model, it is estimate Provo's rate payers would pay at least $58.41 or 2.29% of the MAGI toward their sewer bills. The Utah Water Quality Board's State Affordability Criterion of 1.4% of MAGI ($30,600 for Provo City) or $36.87 per month for the City, will be exceeded by the project allowing for the consideration of grant funds as part of a funding package. Based on the Financial Burden Evaluation Policy for the Utah Wastewater Project Assistance Program, the community has a Financial Burden of: **High**.

STAFF COMMENTS

Staff strongly supports this an important project. This project will allow Provo City to maintain compliance with Division of Water Quality Discharge requirements and new requirements that

result from the Utah Lake Study. Specifically, it will make it possible for the plant to control the amount of nitrogen that is discharged from the treatment facility. Through discussions Provo has stressed that both the quantity and quality of funding assistance matters greatly to the City and in that respect near full assistance is critical to push the project to completion.

STAFF RECOMMENDATIONS:

Staff recommends **the Board authorize a funding package of a $10,000,000 in loan at an interest rate of 0.5% repayable over 20 years plus $5,000,000 of additional funding as principal forgiveness** with the following special conditions:

1. Provo must agree to participate annually in the Municipal Wastewater Planning Program (MWPP).
2. Provo must pursue and retain remaining funding necessary to fully implement the project.
3. Provo must develop and implement an asset management program that is consistent with EPA's Fiscal Sustainability Plan guidance.

Provo City – MBR Project
January 26, 2022
Attachment 1

Attachment 1- Cost Model

Provo City - Water Quality Board

Project Costs

Legal/Bonding	$	50,000
DWQ Loan Origination Fee	$	883,000
Engineering - Design	$	4,900,000
Engineering - CMS	$	7,200,000
Construction	$	115,000,000
Contingency (10%)	$	11,500,000
Total Project Cost:	**$**	**139,533,000**

Current Customer Base & User Charges

Initial Total Customer (ERU's)	33,424
MAGI for Provo City (2020):	$30,600
Affordable Monthly Rate at 1.4%	$35.70
Impact Fee (per ERU):	$2,371
Current Monthly Fee (per ERU)	$75.75
Existing Sewer Debt Service	$660,000
Annual O&M expense	$9,553,390
Local Contribution Generation	$14.69

Project Funding

Local Contribution	$	29,300,000
Amount That Needs to be Funded	**$**	**110,233,000**
Total Project Cost:	**$**	**139,533,000**

Funding Conditions

Loan Repayment Term:	20
Reserve Funding Period:	6
2018 WQB Interest Rate	0.50%
Private Loan Interest Rate*	3.75%

ESTIMATED COST OF SEWER SERVICE

2018 WQB		2022 WQB		WQB Loan Interest Rate	WQB Loan Debt Service and reserve	Private Loan Amount	Private Loan Debt Service	Total Annual Sewer Cost	Monthly Sewer Cost/ ERU	Sewer Cost as % of MAGI	Financial Burden
Principal Forgiveness	WQB Loan	Principal Forgiveness	WQB Loan								
Current Deal (no new basins)											
2,000,000	75,800,000				4,990,146	12,433,000	894,705	16,098,241	54.83	2.15%	HIGH
Additional Assistance											
2,000,000	75,800,000				4,737,500	32,433,000	2,333,947	17,284,837	57.78	2.27%	HIGH
2,000,000	75,800,000	1,000,000	11,500,000	0.50%	5,747,227	19,933,000	1,434,420	17,395,037	58.06	2.28%	HIGH
2,000,000	75,800,000	2,000,000	10,500,000	0.50%	5,681,394	19,933,000	1,434,420	17,329,204	57.90	2.27%	HIGH
2,000,000	75,800,000	3,000,000	9,500,000	0.50%	5,615,560	19,933,000	1,434,420	17,263,371	57.73	2.26%	HIGH
2,000,000	75,800,000	2,000,000	13,000,000	0.50%	5,845,976	17,433,000	1,254,515	17,313,881	57.86	2.27%	HIGH
2,000,000	75,800,000	3,000,000	12,000,000	0.50%	5,780,143	17,433,000	1,254,515	17,248,048	57.69	2.26%	HIGH
2,000,000	75,800,000	4,000,000	11,000,000	0.50%	5,714,310	17,433,000	1,254,515	17,182,215	57.53	2.26%	HIGH
2,000,000	**75,800,000**	**5,000,000**	**10,000,000**	**0.50%**	**5,648,477**	**17,433,000**	**1,254,515**	**17,116,382**	**57.36**	**2.25%**	**HIGH**
2,000,000	75,800,000	2,000,000	16,000,000	0.50%	6,043,475	14,433,000	1,038,629	17,295,494	57.81	2.27%	HIGH
2,000,000	75,800,000	3,000,000	15,000,000	0.50%	5,977,642	14,433,000	1,038,629	17,229,661	57.65	2.26%	HIGH
2,000,000	75,800,000	4,000,000	14,000,000	0.50%	5,911,809	14,433,000	1,038,629	17,163,828	57.48	2.25%	HIGH
2,000,000	75,800,000	5,000,000	13,000,000	0.50%	5,845,976	14,433,000	1,038,629	17,097,995	57.32	2.25%	HIGH

ATTACHMENT 2

Provo City Authorization Report

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF WATER QUALITY
Erica Brown Gaddis, PhD
Director

TO: Water Quality Board

THROUGH: Erica Brown Gaddis, PhD
John K Mackey, P.E.

FROM: Ken Hoffman, P.E.

DATE: April 22, 2020

SUBJECT: Provo MBR Project Update

At the December 3, 2018 Utah Water Quality Board (Board) meeting, Provo requested $120 million in funding assistance with a local contribution of $30 million to construct Phase 1 of 2 of a $240 million overall project. The staff feasibility report that was provided to the Board at that time with a request for loan authorization is included in Attachment 1 for reference. This memo provides an update on the Provo Membrane Bioreactor (MBR) Project for which the Board authorized a $77.8 million loan, including $2 million in principal forgiveness, with an interest rate of 0.5% and a term of 20 years.

Based on Provo's most current capital facilities plan, this project will require replacement of the liquid stream treatment process in two separate phases instead of one, as contemplated previously. Under the current plan, the existing facilities will be replaced in three construction phases: Phase 1 - Secondary Treatment Upgrades and Collections, Phase 2 - Primary Treatment Upgrades, and Phase 3 - Biosolids Upgrades. Additional construction for future capacity expansion is also contemplated in the plan. The first phase of construction, Secondary Treatment Upgrade Phase, will replace the secondary processes, but the existing headworks and primary treatment processes will remain in service for approximately 7 years until Provo can generate the necessary funds for this upgrade and for Phase 2, the Primary Treatment Upgrade Phase. It is anticipated that separating the Secondary and Primary Treatment Upgrades into separate phases (now Phase 1 and Phase 2) will result in an additional $5,000,000 cost due to the need for temporary facilities and cost escalation. Figure 1 is a map of the facility showing how the proposed upgrades will be phased.

The major component of the **Secondary Treatment Upgrade Phase** is the construction of three bioreactors for the MBR system. The bioreactors will consist of return activated sludge (RAS) fermentation, anaerobic, anoxic, and aerobic zones that will promote the microbial removal of solids, organics, nutrients and other wastewater constituents. A fine screen facility is required upstream of the membranes to protect them from damage caused by small debris accumulation. The fine screen facility will be placed downstream of the existing primary clarifiers. To promote the removal of phosphorus from the plant and to prevent struvite scaling, a struvite management system will be added to the existing solids stream process. In addition, the plant's four existing aeration basins will be repurposed for use as equalization/surge basins to support the stable operation of the system. Last, the plant's existing blower building will be decommissioned, and a new blower building will be constructed to provide air for the biological process and membrane scouring. Permeate from the membrane system will be conveyed to the existing UV disinfection facility for disinfection, as was previously planned. The existing coarse screening, grit removal, and primary clarification facilities will continue to be used. The solids processing

facilities will be refurbished as necessary for continued use, including the primary sludge pump station, primary and secondary digesters, dissolved air floatation thickening (DAFT), and dewatering facility.

The **Primary Treatment Upgrades Phase (Phase 2)** will decommission the existing influent junction structure, headworks, primary clarifiers, and primary sludge pumping station. A new operations building will be constructed and the old one abandoned. A new influent junction structure will be constructed, which will receive the sanitary sewer flow that was formerly received by the existing influent junction box. New coarse screens and grit removal facilities will be constructed. Piping will be installed to convey flow from the plant lift station and new influent junction structure to the new headworks facilities. The primary clarifiers will be replaced by a primary screening facility. Screened influent will flow to the bioreactors as before.

The **Biosolids Treatment Upgrade Phase (Phase 3)** will include decommission of the existing solids handling facilities. New solids handling facilities will include the addition of gravity sludge tanks (GST), DAF Thickener, Centrate Pump Station, GST and DAFT Pump Station, Digesters and Digester Building, Solids Holding Tank and Sludge Transfer Station.

A future capacity expansion phase will be conducted as needed. It is anticipated that two additional bioreactors will be required to meet the 2060 estimated build out capacity of the Provo City service area.

Below is a comparison of the costs of the change in Project Planning and the estimated year the project would be completed. Overall staff sees no change in the overall project. The delay of Primary Treatment Upgrades is expected to cost the community an additional $5,000,000. The construction of the new MBR secondary treatment during Secondary Treatment Upgrades will still produce a high quality effluent by 2025.

Planning Date	**WQB Authorization (December 2018)**	**December 2019**		
Project(s)	Primary & Secondary Treatment and Collections	Secondary Treatment and Collections	Primary Treatment	Biosolids & Capacity Expansion
Construction Completion	**2023**	**2024**	**2031**	**2036-2050**
Legal/Bonding	$50,000	$50,000		
DWQ Loan Origination	$1,212,000	$1,212,000		
Engineering, CMS	$9,100,000	$10,700,000	$3,770,000	$12,520,000
Construction - Treatment Plant	**$81,200,000**	**$82,980,000**	**$29,020,000**	**$96,330,000**
Construction - Pump Stations	$6,000,000	$10,700,000		
Construction - Interceptor Sewers	$27,000,000	$32,380,000	$3,370,000	
Collection System Rehab	$6,000,000	$7,110,000		
Contingency	$20,700,000	$31,220,000	$9,720,000	$28,900,000
Total Estimated Expenditure	$151,262,000	$176,352,000	$45,880,000	$137,750,000
Funding				
Utah SRF - Treatment Plant	**$77,800,000**	**$77,800,001**	**$0**	
City	$73,462,000	$98,551,999	$45,880,000	$137,750,000

Date Received: Sept. 26, 2018
Date to be presented to the WQB: December 3, 2018

WATER QUALITY BOARD
FEASIBILITY REPORT FOR WASTEWATER TREATMENT PROJECT
AUTHORIZATION

APPLICANT:	Provo City 351 West Center Provo, UT 84601 Telephone: (801) 852-7105
PRESIDING OFFICIAL:	Mayor Michelle Kaufusi
TREASURER/RECORDER:	Dan Follett/Amanda Ercanbrack
CONSULTING ENGINEER:	Cory Christiansen, P.E. (for planning) Waterworks Engineering 672 West 220 South, Bldg A Pleasant Grove, UT 84062 (801) 785-4105
BOND COUNSEL:	Eric Hunter Chapman and Cutler 215 South State Street Salt Lake City, UT 84111 (801) 536-1441

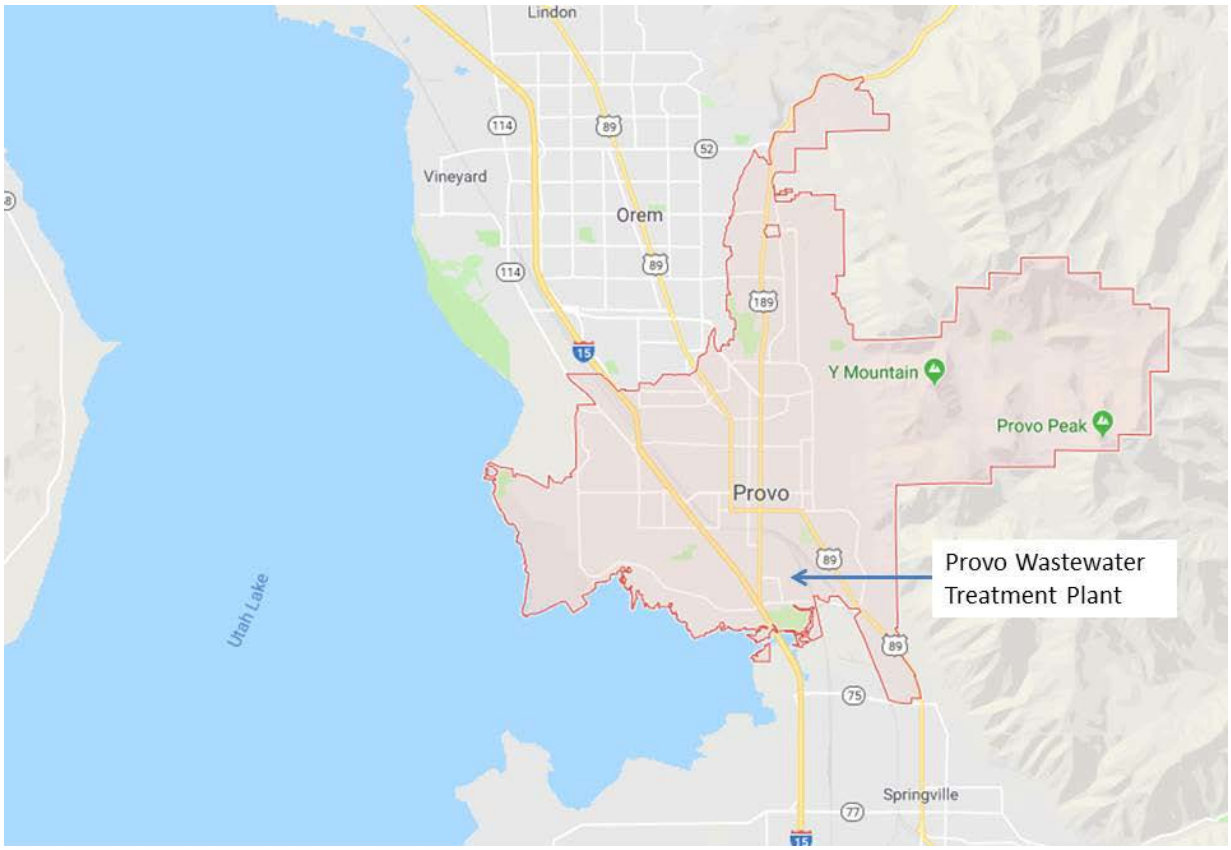
APPLICANT'S REQUEST:

Provo City is requesting a construction loan from the Utah Water Quality Board in the amount of $121,262,000 for construction of a new water reclamation plant.

APPLICANT'S LOCATION:

Provo City is located in Utah County on the eastern shore of Utah Lake. Provo's current treatment plant is located on the southern border near Provo Bay at 1685 South East Bay Boulevard.

MAP OF APPLICANT'S LOCATION



BACKGROUND:

The Provo City water reclamation facility treats an average flow of 12 MGD and serves a population of 116,868. The facility is designed for an average flow of 21 MGD and a design equivalent population of 160,000. The current treatment plant was built in the 1950's and was upgraded in 1978. In 1998, the tertiary filters were rehabilitated and permanent dechlorination facilities were operational in 1999.

The City has determined that the existing treatment plant would require major upgrades to maintain operations and has determined that a new treatment plant would best serve the City's long-term needs. Building a new plant with best available technology would meet not only the State's phosphorus (TBPEL) regulations but also anticipated future regulations. Seismic safety and other concerns with the old infrastructure would also be addressed with this new facility. The City is also considering aquifer recharge or other reuse of its treated effluent. Utah County is one of the fastest growing parts of the state and Provo City aims to have updated infrastructure in place to accommodate this growth.

The City also owns and operates its own wastewater collection system and maintains biosolids, pretreatment, and multi-sector stormwater permits for the water reclamation facility and a permit

for the City's municipal separate storm sewer system (MS4) program.

Provo City is currently in compliance with all UPDES permits associated with the Provo City Water Reclamation Facility including discharge, biosolids, pretreatment, and storm water. DWQ is working with the City to address several deficiencies in the municipal separate storm sewer system (MS4) program.

PROJECT NEED:

Provo currently discharges to Mill Race which flows to Provo Bay in Utah Lake. Utah Lake is listed on the 2016 Integrated Report: Lakes and Reservoirs 305(b) and 303(d) for harmful algal blooms, total dissolved solids, total phosphorus, and PCB in fish tissue. In addition, Provo Bay is listed for pH, total phosphorus, total ammonia and PCB in fish tissue. The improvement in effluent water quality from this project would significantly improve the water quality discharged from the reclamation facility and in turn the water quality of Provo Bay and Utah Lake.

PROJECT DESCRIPTION:

Provo City is proposing to construct a new treatment plant, replacing its existing works. The project will include Administration/Operations building, Influent pumping, Screening and grit removal, Primary treatment (dependent on selection of secondary process), Secondary treatment including biological nutrient removal, Filtration, UV disinfection, Solids digestion, Solids thickening and dewatering, Phosphorus and ammonia side stream treatment (dependent on digestion and dewatering processes), Ancillary support structures. The City also proposes to construct 3 miles of new interceptor sewer / force main for improved service to the City's growing west side. Provo continues to engage other nearby cities to fully evaluate regionalization opportunities.

The proposed project is Phase 1 of a two phase program being planned by the City. The City is currently soliciting proposals to engage a design team for Phase 1. Phase 2 addresses long term, buildout conditions and needs.

ALTERNATIVES EVALUATED:

Alternative	Description	Estimated Cost
1	Do Nothing	Not a Feasible Alternative
2	Upgrade Current Plant	$59,000,000
3	New Facility – Phased Implementation	$150,000,000
	New Facility Phase II (2031 construction)	$90,000,000
4	New Plant 24 mgd	$224,500,000

Provo City Council has directed its staff to pursue construction of a new facility with phased implementation (Alternative 3). The City continues to evaluate its options within this alternative to achieve the most cost effective long term solution for its growth and water quality protection.

POSITION ON PROJECT PRIORITY LIST:

This project is ranked 2nd out of 10 projects on the Wastewater Treatment Project Priority List.

POPULATION GROWTH:

There are an estimated 30,490 ERUs in Provo City's service area. The following populations for Provo City are taken from Utah Governor's Office of Management and Budget (GOMB) and Zion Public Finance.

Year	Population
2016	116,868
Estimated 2020	138,143
Estimated 2035	164,786
Estimated 2050	190,000

PUBLIC PARTICIPATION AND DEMONSTRATION OF PUBLIC SUPPORT:

Provo City Council has held work sessions and public meetings to discuss the proposed project and has resolved to advance the project and request financial assistance from the Water Quality Board.

EFFORTS TO SECURE FINANCING FROM OTHER SOURCES:

Provo City does not qualify for Community Impact Board (CIB) or US Rural Development funding. Provo City is investigating funding the additional needed funding for their aquifer storage and recharge project from State of Utah Division of Drinking Water.

IMPLEMENTATION SCHEDULE:

The proposed schedule for implementation of the Phase 1 construction project is as follows:

WQB Introduction	October 24, 2018
WQB Funding Authorization:	December 03, 2018
Start Construction	2020
Complete Construction	Fall 2023

FISCAL SUSTAINABILITY REVIEW:

Provo City participates in MWPP self-assessment and is pursuing updating their Capital Facility Plan and doing an impact fee study. The anticipated cost of the project to system users will be among the highest in the state if not the highest and clearly exceeding the Board's 1.4 percent MAGI threshold. The City has about $1.03 billion in available general obligation (GO) borrowing capacity and only about $35 million in outstanding GO debt.

APPLICANT'S CURRENT USER CHARGE:

The 2016 median adjusted gross income (MAGI) for Provo City is $28,606, which is 35 percent lower that the state average of $44,268. Based on the Board's affordability criterion of 1.4% MAGI, the maximum affordable sewer bill for Provo City is $33.37.

Provo City uses a progressive rate structure wherein sewer service fees are calculated based on a base rate plus a winter-time water usage commodity charge. Based on their FY2017 Comprehensive Annual Report sewer revenues and 30,490 ERU, the City's current average sewer bill is about $25.98 per month per ERU or 1.09 percent of MAGI. Effective in FY2018, the City increased its base rate 19 percent and its commodity charge 36 percent for residential users. This increase will result in an average sewer bill of roughly $33.12 per month or 1.39 percent of MAGI. Provo is currently conducting an impact fee study; the last impact fee study was completed in 2013.

Provo City expects to again increase rates in FY2019 to an average of $48.13 per month or 2.02 percent of MAGI. At current cost of operation, the City would generate $10 million per year for current and future capital improvement projects.

COST ESTIMATE:

The estimated cost of Provo City's new treatment plant construction is outlined in the following table.

Item	**Funded Project Cost**
Legal/Bonding	$ 50,000
DWQ Loan Origination	$ 1,212,000
Engineering, CMS	$ 9,100,000
Construction – Treatment Plant	$ 81,200,000
Construction - Pump Stations	$ 6,000,000
Construction - Interceptor Sewers	$ 27,000,000
Collection System Rehab	$ 6,000,000
Contingency	$ 20,700,000
Total	**$ 151,262,000**

In addition, to the described project, Provo will have an additional Phase II of the project in approximately 2031 for an additional $90,000,000. Provo hopes to pay for this Phase II using a pay as you go model and save capital to pay for this with cash reserves generated between 2025 and 2031.

COST SHARING:

Funding Source	Cost Sharing	Percent of Project
Local Contribution (cash)	$ 30,000,000	20%
WQB Loan	$ 121,262,000	80%
Total	$ 151,262,000	100%

ESTIMATED ANNUAL COST FOR SEWER SERVICE:

Staff developed cost models to evaluate several financing alternatives for the project. The basic cost model data used in modeling financial alternatives for the project are provided below:

Operations and Maintenance (O&M) – Annual $10,040,000
Existing Debt – Annual $660,000
Weighted Median Adjusted Gross Household Income (2016) $28,606
Weighted Maximum Affordable Sewer Rate at 1.4 % MAGI $33.37

The static model financing alternatives considered are given in Attachment 1. The static cost model shows that the required user rates will be above the Board's affordability criterion of 1.4% of MAGI. Current market rates index as follows:

US 20-year Treasury Bond[1]	3.35%
US 30-year Treasury Bond[1]	3.25%
MBIS Municipal Bond Index, 20-year[2]	3.524%

1. U.S. Department of The Treasury https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield
2. EMMA Municipal Securities and Rulemaking Board. https://emma.msrb.org/ToolsAndResources/MarketIndicators

Staff prepared a cost model for evaluation of possible loan terms and affordability. Static Model 1 (Attachment 1) presents a conventional 20 years loan approach that is typical of what the Board usually sees. This model shows that for the proposed $121 million loan, average user rates would exceed 2 percent of the 2016 MAGI.

The City has proposed a financing plan under which it will increase sewer rates to annually generate capital improvement revenues. These capital improvement funds will be used to accelerate loan repayments as well as to self-fund asset management and ongoing capital improvements through Phase 2 of the City's overall capital facilities plan. This financing plan from the City is based on a 15 year loan term and a $13 million per year annual capital expenditures cost item. In this financing plan the monthly average sewer rates would exceed $91.50 per month per user or 3.8 percent of MAGI.

Both of these financing plans would require user rates well above the Board's affordability criterion of 1.4% of MAGI. Based on this, Provo City has requested the Board be as aggressive as possible with a low interest rate to help the project be affordable.

STAFF COMMENTS:

Staff supports the Provo treatment plant construction project. It is an important water quality project that will enable Provo to meet and exceed the new TBPEL requirement, reduce phosphorus and nitrogen discharges to the impaired Utah Lake, and provide cost effective and efficient service to a large and growing population service area in the state.

Staff recommends the Board consider a loan interest rate based on the following discounting factors. The 20-year market loan rate is 3.53 percent based on the MBIS Municipal Bond Index which is 0.26% above the 20-year US Treasury bond. Note that 1 percent interest on a $121,000,000 loan is $13.1 million in interest earned over a 20 year term.

Market Rate (20 year basis)		3.53 %
Discount Factors:	Maximum Discount	Recommended Discount
Economic Hardship	3.53 %	2.23 %
Other Hardship	1.0 %	--
SRF Programmatic Costs	1.0 %	0.5 %
Fiscal Sustainability Credit	0.5 %	0.25 %
Green Project Reserve	0.5 %	--
Regionalization	0.25 %	--
Recommended Interest Rate		**0.55%**

Although Provo City is requesting $121,262,000 in financial assistance from the Water Quality Board, staff has determined that, to continue to support other important water quality projects in the state and maintain positive fund balances through the critical construction period, the board is not able to fully fund this large project. In discussions with the board, Provo City, and other applicants, the maximum funding available to support the project on Provo's schedule is $77,800,000. Provo City has agreed (in concept) to fund the remainder of this portion of the project, as well as the remainder of the $151 million phase of the project through public market and other financing.

Funding Source	Cost Sharing	Percent of Project
Provo Other Funding Sources	$73,462,000	48.6%
WQB (Loan to Provo)	$75,800,000	50.1%
Principal Forgiveness	$2,000,000	1.3%
Total	$151,262,000	100%

Provo City will need to bond for the additional funds on the public market. Assuming the additional funds will be obtained with an interest rate of 3.5 percent, the overall interest rate for for Provo City will increase by 0.87% to cover the added cost for the $43 million that is being added to the market financing package. The resulting weighted interest rate for the entire $151 million bond package would become 2.04% instead of 1.17%, were the Board able to fund the requested $121 million at 0.55%.

Reducing the interest rate to 0.5% and including $2,000,000 of principal forgiveness for Provo on the reduced loan would result in a 1.90% weighted interest rate for their entire financing package. A cost model based on the reduced funding amount is shown in Attachment 2, including a weighted interest rate based on the WQB loan and increase in market financing required.

The table below shows a comparison between the requested funding and the funding provided by the reduced WQB funding amounts.

Financing	WQB Funding @ Int. Rate	Initial Market Funding @ Int. Rate[2]	Additional Market Funding @ Int. Rate[2]	Weighted Interest Rate
Requested	$121,361,000 @ 0.55%	$30,000,000 @ 3.5%	$0 @ 3.5%	1.17%
Recommended	$75,800,000 @ 0.50% PF[1] $2,000,000	$30,000,000 @ 3.5%	$43,128,000 @ 3.5%	1.90%

[1]PF – Principal Forgiveness
[2] Note: The calculations presented in this table are based on current market interest rates. DWQ staff recognize that interest rates are currently rising and may be as high as 4 – 5% at the time that Provo City applies for a market loan.

STAFF RECOMMENDATION:

Staff recommends that the Board authorize funding to Provo **of $2,000,000 in principal forgiveness and a loan of $75,800,000 at an interest rate of 0.5% repayable over 20 years with an adjusted amortization schedule with principal payments not to exceed $50,000/year until 2027, and then amortized over the remaining term of the loan.** Subject to the following special conditions:

1. Provo must agree to participate annually in the Municipal Wastewater Planning Program (MWPP).
2. Provo must pursue and retain remaining funding necessary to fully implement the project.
3. Provo must develop and implement an asset management program that is consistent with EPA's Fiscal Sustainability Plan guidance.

Attachments: Provo City Static Cost Model 1 & 2
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DWQ-2018-012980
File: Provo City, Admin, Section 1

ATTACHMENT 1

Provo - Water Quality Board

20 Year Loan Static Cost Model

Project Costs		Total
Loan Origination Fee	$	1,211,000
Financing Process Costs	$	150,000
Engineeernig	$	9,100,000
Construction	$	120,200,000
Contingency (~15%)	$	20,700,000
Total Project Cost:	**$**	**151,361,000**

Current Customer Base & User Charges		
Total ERU's (Projected 2020)	$	30,490
Weighted Average MAGI (2016):	$	28,606
Affordable Monthly Rate at 1.4%	$	33.37
Current Impact Fee		
Current Average Monthly Fee (per ERU)	$	48.13
Existing O&M expenses Treatment & Collection	$	10,040,000
New O&M expenses Treatment	$	9,740,000
Existing Sewer Debt Service	$	660,000

Project Funding		
Publicly issued bonds @ 3.5%	$	30,000,000
Additional bonds @ 3.5%	$	-
WQB Loan	$	121,361,000
Principal Forgiveness		-
Total Project Cost:	**$**	**151,361,000**

Funding Conditions	
Loan Repayment Term:	20
Reserve Funding Period:	6

ESTIMATED COST OF SEWER SERVICE

WQB Loan Amount	WQB Loan Interest Rate	Annual WQB Loan Debt Service	WQB Loan Reserve	WQB Debt Service & Loan Reserves	Required other new Debt Service Payemnts*	Weighted Interest Rate for Project	Existing Debt Payments	Annual Sewer O&M Cost	Total Annual Sewer Cost	Monthly Treatment Cost/ERU	Sewer Cost as a % of MAGI
$ -		$ -	$ -	$ -			$ 660,000	$ 9,740,000	$ 10,400,000	$ 28.42	1.19%
$ 121,361,000	0.00%	$ 6,068,050	$ 1,517,013	$ 7,585,063	$ 2,110,832	0.75%	$ 660,000	$ 9,740,000	$ 20,095,895	$ 54.92	2.30%
$ 121,361,000	0.25%	$ 6,228,596	$ 1,557,149	$ 7,785,745	$ 2,110,832	0.94%	$ 660,000	$ 9,740,000	$ 20,296,577	$ 55.47	2.33%
$ 121,361,000	0.55%	**$ 6,424,565**	**$ 1,606,141**	**$ 8,030,707**	$ 2,110,832	1.17%	**$ 660,000**	**$ 9,740,000**	**$ 20,541,539**	**$ 56.14**	**2.36%**
$ 121,361,000	0.80%	$ 6,590,622	$ 1,647,656	$ 8,238,278	$ 2,110,832	1.36%	$ 660,000	$ 9,740,000	$ 20,749,110	$ 56.71	2.38%
$ 121,361,000	1.05%	$ 6,759,165	$ 1,689,791	$ 8,448,956	$ 2,110,832	1.56%	$ 660,000	$ 9,740,000	$ 20,959,788	$ 57.29	2.40%
$ 121,361,000	1.30%	$ 6,930,179	$ 1,732,545	$ 8,662,724	$ 2,110,832	1.75%	$ 660,000	$ 9,740,000	$ 21,173,556	$ 57.87	2.43%
$ 121,361,000	1.55%	$ 7,103,651	$ 1,775,913	$ 8,879,564	$ 2,110,832	1.95%	$ 660,000	$ 9,740,000	$ 21,390,396	$ 58.46	2.45%
$ 121,361,000	1.80%	$ 7,279,564	$ 1,819,891	$ 9,099,455	$ 2,110,832	2.14%	$ 660,000	$ 9,740,000	$ 21,610,287	$ 59.06	2.48%
$ 121,361,000	2.05%	$ 7,457,901	$ 1,864,475	$ 9,322,376	$ 2,110,832	1.64%	$ 660,000	$ 9,740,000	$ 21,833,209	$ 59.67	2.50%

*3.5% interest rate used for estimating other new debt service

ATTACHMENT 2

Provo - Water Quality Board

20 Year Loan Static Cost Model

Project Costs		Total
Loan Origination Fee	$	778,000
Financing Process Costs	$	150,000
Engineeernig	$	9,100,000
Construction	$	120,200,000
Contingency (~15%)	$	20,700,000
Total Project Cost:	**$**	**150,928,000**

Current Customer Base & User Charges		
Total ERU's (Projected 2020)	$	30,490
Weighted Average MAGI (2016):	$	28,606
Affordable Monthly Rate at 1.4%	$	33.37
Current Impact Fee		
Current Average Monthly Fee (per ERU)	$	48.13
Existing O&M expenses Treatment & Collection	$	10,040,000
New O&M expenses Treatment	$	9,740,000
Existing Sewer Debt Service	$	660,000

Project Funding		
Publicly issued bonds @ 3.5%	$	30,000,000
Additional bonds @ 3.5%	$	43,128,000
WQB Loan	$	75,800,000
Principal Forgiveness		2,000,000
Total Project Cost:	**$**	**150,928,000**

Funding Conditions	
Loan Repayment Term:	20
Reserve Funding Period:	6

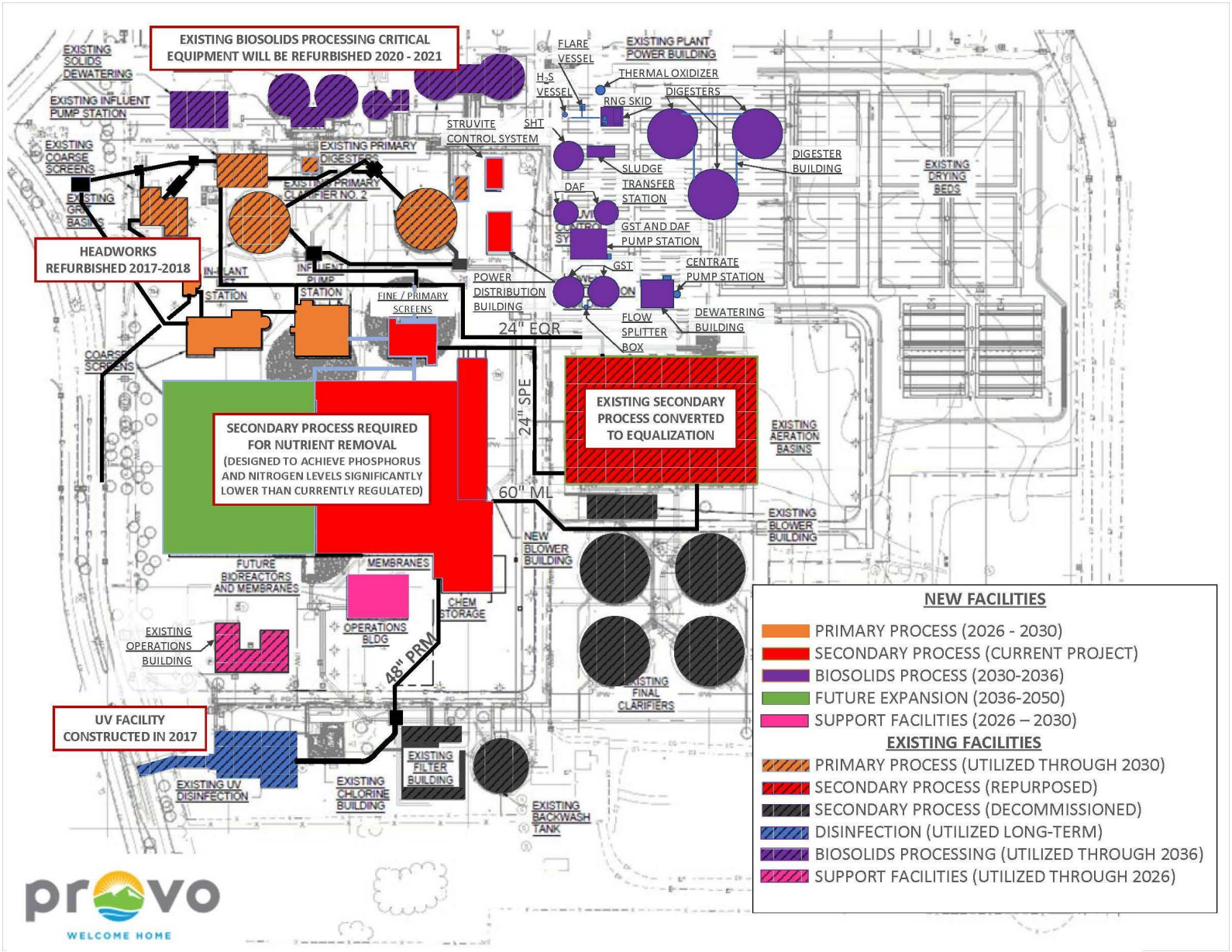
ESTIMATED COST OF SEWER SERVICE

WQB Loan Amount	WQB Loan Interest Rate	Annual WQB Loan Debt Service	WQB Loan Reserve	WQB Debt Service & Loan Reserves	Required other new Debt Service Payemnts*	Weighted Interest Rate for Project	Existing Debt Payments	Annual Sewer O&M Cost	Total Annual Sewer Cost	Monthly Treatment Cost/ERU	Sewer Cost as a % of MAGI
$ -		$ -	$ -	$ -			$ 660,000	$ 9,740,000	$ 10,400,000	$ 28.42	1.19%
$ 75,800,000	0.00%	$ 3,790,000	$ 947,500	$ 4,737,500	$ 5,145,365	1.67%	$ 660,000	$ 9,740,000	$ 20,282,865	$ 55.44	2.33%
$ 75,800,000	0.25%	$ 3,890,274	$ 972,569	$ 4,862,843	$ 5,145,365	1.79%	$ 660,000	$ 9,740,000	$ 20,408,207	$ 55.78	2.34%
$ 75,800,000	0.50%	$ **3,992,117**	$ **998,029**	$ **4,990,146**	$ 5,145,365	1.90%	$ **660,000**	$ **9,740,000**	$ **20,535,511**	$ **56.13**	**2.35%**
$ 75,800,000	0.75%	$ 4,095,522	$ 1,023,880	$ 5,119,402	$ 5,145,365	2.02%	$ 660,000	$ 9,740,000	$ 20,664,767	$ 56.48	2.37%
$ 75,800,000	1.00%	$ 4,200,481	$ 1,050,120	$ 5,250,601	$ 5,145,365	2.13%	$ 660,000	$ 9,740,000	$ 20,795,966	$ 56.84	2.38%
$ 75,800,000	1.25%	$ 4,306,986	$ 1,076,746	$ 5,383,732	$ 5,145,365	2.25%	$ 660,000	$ 9,740,000	$ 20,929,097	$ 57.20	2.40%
$ 75,800,000	1.50%	$ 4,415,027	$ 1,103,757	$ 5,518,783	$ 5,145,365	2.37%	$ 660,000	$ 9,740,000	$ 21,064,148	$ 57.57	2.42%
$ 75,800,000	1.75%	$ 4,524,595	$ 1,131,149	$ 5,655,744	$ 5,145,365	2.49%	$ 660,000	$ 9,740,000	$ 21,201,108	$ 57.95	2.43%
$ 75,800,000	2.00%	$ 4,635,679	$ 1,158,920	$ 5,794,599	$ 5,145,365	2.61%	$ 660,000	$ 9,740,000	$ 21,339,964	$ 58.33	2.45%

*3.5% interest rate used for estimating other new debt service

FIGURE 1

FACILITY LAYOUT AND UPGRADE PHASING



State of Utah

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF WATER QUALITY
Erica Brown Gaddis, PhD
Director

TO: Water Quality Board

THROUGH: Erica Brown Gaddis, PhD

FROM: Skyler C. Davies, P.E.

DATE: January 26, 2022

SUBJECT: South Salt Lake City
South Salt Lake City Request for Supplemental Funding Memo

South Salt Lake City received an authorization for $9,248,000 (0%, 20YR) Loan and $2,000,000 in Principal Forgiveness on December 3, 2018. At the time it was anticipated that this would cover South Salt Lake City's portion of the funding necessary to complete CVWRF's nutrient upgrade. Cost growth has increased the cost of the project and as such South Salt Lake City's portion of the project has increased by about $2.8 million. The original Authorization memo is included in this packet as Attachment 2 for reference.

APPLICANT'S REQUEST

The City of South Salt Lake (City) is requesting supplemental hardship financial assistance from the Utah Water Quality Board in the amount **of $1,760,000** to cover the City's share of the cost growth associated with the BNR Basin Project, plus **$1,032,000** to cover their portion of the additional costs for the Blower Building Project.

PROJECT NEED

Central Valley Water Reclamation Facility (CVWRF) provides wastewater treatment to several cities and districts. CVWRF is in the process of upgrading the water reclamation facility to a Biological Nutrient Removal treatment process to comply with the TBPEL as well as improve other aspects of water quality prior to discharge to Mill Creek and subsequently the Jordan River.

The Jordan River has been identified as impaired for Dissolved Oxygen (DO) and Total Dissolved Solids (TDS) based on the 2004-303(d) assessment process as defined in the Clean Water Act. Central Valley also cannot reduce phosphorus to 1.0 mg/L TBPEL with its current facility. This

project will significantly reduce phosphorus and total nitrogen discharges to the lower Jordan River system, and bring the CVWRF into compliance with the TBPEL requirements.

The City, as a member entity of CVWRF, is obligated to participate in the funding of the CVWRF capital improvements.

PROJECT DESCRIPTION

See Page 5 of the attached South Salt Lake City's Feasibility Report: Authorization

POSITION ON PROJECT PRIORITY LIST

South Salt Lake City is currently ranked No. **2** of 8 on the Wastewater Treatment Project Priority List (PPL)

APPLICANT'S CURRENT USER CHARGE

The City has increased its rates several times in preparation to fund their portion of the project, increasing their rates over time from $5 to $9 per 1,000 gallons resulting in an average monthly bill of around $63 per month for residential customers. The Utah Water Quality Board's State Affordability Criterion for a user rates is 1.4% of MAGI ($34,500 for South Salt Lake City) or $40.25 per month for the City will be exceeded for the project allowing for the consideration of grant funds as part of a funding package. The large cost of the project, in addition to its timing, has resulted in hardship for the City's sewer customers. Based on the Financial Burden Evaluation Policy for the Utah Wastewater Project Assistance Program, the community has a Financial Burden of: **High**. The City is seeking additional assistance from WQB in to mitigate the high financial burden of the project on its sewer customers.

COST SHARING

South Salt Lake City was funded separately from CVWRF for this project due to the greater hardship they are experiencing in comparison to the other entities served by CVWRF. CVWRF has bid the majority of the projects associated with the upgrades to the facility necessary to meet the TBPEL. Almost all of the projects came in with significantly higher costs than anticipated when CVWRF and the City originally came to the Board. The overall improvement project has increased from approximately $187 million to $305 million. Cost sharing for CVWRF's seven member entities is based on each entity's percentage of total flow to the plant. Fortunately for South Salt Lake City their portion of the project has decreased from around 6% to the current rate of under 5% due to flow re-evaluation that was recently completed prior to September 2021. Accounting for the increase in cost and decrease in the City liability for the project, the City has increased its needed overall funding from about $11.25 million to about $14.03 million depending on bonding costs.

Table 1 summarizes the 2018 vs the 2022 estimates, along with the flow percentage change.

Table 1: Static Cost Model Example at 0%

Project Cost Table	
2018 Estimate	
Original CVWRF Total Project Cost	$177,059,000
Original South Salt Lake City's portion	6.29%
South Salt Lake Portion of Project	$11,137,000
Contingency Funding	$19,000
Loan Origination Fee	$92,480
Original SSL Funding	$11,248,000

Updated 2022 Estimates	
Updated CVWRF Total Project Cost	$305,000,000
South Salt Lake City's updated portion	4.60%
South Salt Lake Portion of Project	$14,030,000
SSL Portion Less Original Funding	$2,874,000
SSL Pay GO Self Funding	$114,000
SSL Supplemental Funding Request for BNR	$1,760,000
SSL Supplemental Funding Request for BB	$1,000,000
Total SSL Supplemental Funding Need less Closing Costs	$2,760,000

COST MODEL

The 2020 median adjusted gross income (MAGI) for South Salt Lake is $34,500 which is 74% of the state average MAGI. As mentioned above the City will finish paying off their existing debt this year which will help with the cost to its citizens. However, even if the City received all additional needed funds as grant the cost per ERU would be $67.78/month or 2.36% of MAGI.

Different funding options result in different annual sewer costs. A cost model is shown in Attachment 1, which analyzes several possible funding options. The resulting Total Annual Sewer Cost is shown for each funding option.

STAFF COMMENTS

In order to not encumber the entire upgrade, the federal money provided by the WQ Board to both CVWRF and South Salt Lake was used to fund the contract awarded for The Biological Nutrient Removal Basin (BNR) Project. The Existing contract includes American Iron and Steel, Davis Bacon Wages, and Disadvantaged Business Enterprise requirements. South Salt Lake funding fell short by $1.76 million dollars for this particular project. As such staff will recommend that the Board authorize additional funding of $1.76 million dollars as Principal Forgiveness to South Salt Lake City, as South Salt Lake already lies within the High Burden level for the user rates prior to the additional project costs. It is anticipated by staff that if the Board funds the BNR project with Principal Forgiveness that there will not be a need for another loan closing for this part of the project. This would be the least complicated way to assist South Salt Lake City, while helping to offset the additional burden from the BNR project.

South Salt Lake also needs an additional $1,032,000 dollars to cover the increased cost for the other construction. This project has used UWLF funds in order to not place additional federal requirements on this project as CVWRF has used its own funds/other bonding sources to cover the remainder of the Blower Building Project.

South Salt Lake requested and received separate consideration, rather than combined assistance with the CVWRF request, to provide additional subsidy to the South Salt Lake City CVWRF customers. South Salt Lake City has a high burden based on the funding already received which will only increase with the additional cost of the project.

Without additional subsidy for South Salt Lake City, the City's user cost will exceed 2.5% of MAGI as shown in Attachment 1. Even with additional loan of $1,032,000 at an interest rate of 0% repayable over 20 years, and additional principal forgiveness of $1,760,000, user cost would be 2.78%.

STAFF RECOMMENDATION:

Staff recommends that the Board authorize $1,760,000 of additional funding as principal forgiveness to fund the BNR Project and an Utah Wastewater Loan Fund loan of $1,032,000 at an interest rate of 0% repayable over 20 years both with the following special conditions:

1. South Salt Lake must agree to participate annually in the Municipal Wastewater Planning Program (MWPP).
2. South Salt Lake must pursue and retain remaining funding necessary to fully implement the projects.
3. South Salt Lake must develop and implement an asset management program that is consistent with EPA's Fiscal Sustainability Plan guidance.

South Salt Lake City (CVWRF) Supplemental Funding - Authorization
January 26, 2021
Attachment 1- Cost Model

South Salt Lake City - Water Quality Board

20 Year Loan Static Cost Model (Member Entity Portion of CVWRF Improvements)

Project Cost Table	
2018 Estimate	
Original CVWRF Total Project Cost	$177,059,000
Original South Salt Lake City's portion	6.29%
South Salt Lake Portion of Project	$11,137,000
Contingency Funding	$19,000
Loan Origination Fee	$92,480
Original SSL Funding	$11,248,000

Updated 2022 Estimates	
Updated CVWRF Total Project Cost	$305,000,000
South Salt Lake City's updated portion	4.60%
South Salt Lake Portion of Project	$14,030,000
SSL Portion Less Original Funding	$2,874,000
SSL Pay GO Self Funding	$114,000
SSL Supplemental Funding Request for BNR	$1,760,000
SSL Supplemental Funding Request for BB	$1,000,000
Total SSL Supplemental Funding Need less Closing Costs	$2,760,000

Additional SSL Project Costs	
South Salt Lake Portion of Project	$2,760,000
Loan Closing Costs (if there is a loan)	$22,000
Loan Origination Fee 1%	Varies
Total Project Cost:	$2,782,000

Project Funding	
Cash from member entities	$ 21,104,665
Central Valley WQB Loan	$ 81,100,000
Anticipated Publicly issued bonds@3%	$188,851,815
SSL WQB Previously Funded	$ 11,155,520
SSL Project Funding Shortfall	
SSL WQB Additional Project Fundin	**$ 2,760,000**
SSL WQB Additional Closing Fundi	**Varies**

Current Customer Base & User Charges	
Current (ERU):	2,626
MAGI (2020 CITY):	$34,500
Sewer Impact Fee (per ERU):	$1,063
Monthly User Fee (per ERU/10000 gal):	$9.00
User Fee based on 7,000 gal/month	$63.00
~Current User Fee % MAGI	2.19%
1.4% MAGI User Fee	$40.25

Projected Annual Sewer O&M Cost	
Estimated Operating Expenses:	$1,558,000
Existing Sewer Debt Service	$0
Funding Conditions	
Loan Repayment Term:	20 years
Reserve Funding Period:	6 years
FNI	2.73

ALL NEW FUNDING THROUGH WQB

New Funding					Previously Funded					Evaluation of Sewer Costs and Burden					Note: (~ is Approximate)
WQB Grant Amount	WQB Loan Amount	WQB Loan Interest Rate	WQB Loan Debt Service	WQB Loan Reserve	WQB Grant Amount	WQB Loan Amount	WQB Loan Interest Rate	WQB Loan Debt Service	WQB Loan Reserve	Annual Sewer O&M Cost	Total Annual Sewer Cost	Monthly Sewer Cost/ERU	Sewer Cost as a % of MAGI	Financial Burden	~User Cost Per 1,000 Gallons
$1,760,000	**$1,032,000**	**0.0%**	**$51,600**	**$12,900**	**$2,000,000**	**$9,248,000**	**0.0%**	**$462,400**	**$115,600**	**$1,558,000**	**$2,200,500**	**$69.83**	**2.43%**	**High**	**$7.12**
$0	$2,810,000	0.0%	$140,500	$35,125	$2,000,000	$9,248,000	0.0%	$462,400	$115,600	$1,558,000	$2,311,625	$73.36	2.55%	High	$7.48
$500,000	$2,305,000	0.0%	$115,250	$28,813	$2,000,000	$9,248,000	0.0%	$462,400	$115,600	$1,558,000	$2,280,063	$72.36	2.52%	High	$7.38
$1,000,000	$1,800,000	0.0%	$90,000	$22,500	$2,000,000	$9,248,000	0.0%	$462,400	$115,600	$1,558,000	$2,248,500	$71.35	2.48%	High	$7.28
$1,500,000	$1,295,000	0.0%	$64,750	$16,188	$2,000,000	$9,248,000	0.0%	$462,400	$115,600	$1,558,000	$2,216,938	$70.35	2.45%	High	$7.18
$2,760,000	$0	0.0%	$0	$0	$2,000,000	$9,248,000	0.0%	$462,400	$115,600	$1,558,000	$2,136,000	$67.78	2.36%	High	$6.92

GRANT WITH FUNDING THROUGH PARTICIPATING IN CVWRF BONDS (Varies, but 2.5% used for discussion purposes)

New Funding					Previously Funded					Evaluation of Sewer Costs and Burden					
WQB Grant Amount	Market Loan Amount	Market Loan Interest Rate	WQB Loan Debt Service	WQB Loan Reserve	WQB Grant Amount	WQB Loan Amount	WQB Loan Interest Rate	WQB Loan Debt Service	WQB Loan Reserve	Annual Sewer O&M Cost	Total Annual Sewer Cost	Monthly Sewer Cost/ERU	Sewer Cost as a % of MAGI	Financial Burden	~User Cost Per 1,000 Gallons
$0	$2,810,000	2.5%	$180,253	$45,063	$2,000,000	$9,248,000	0.0%	$462,400	$115,600	$1,558,000	$2,361,317	$74.93	2.61%	High	$7.64
$500,000	$2,305,000	2.5%	$147,859	$36,965	$2,000,000	$9,248,000	0.0%	$462,400	$115,600	$1,558,000	$2,320,824	$73.65	2.56%	High	$7.51
$1,000,000	$1,800,000	2.5%	$115,465	$28,866	$2,000,000	$9,248,000	0.0%	$462,400	$115,600	$1,558,000	$2,280,331	$72.36	2.52%	High	$7.38
$1,500,000	$1,295,000	2.5%	$83,071	$20,768	$2,000,000	$9,248,000	0.0%	$462,400	$115,600	$1,558,000	$2,239,838	$71.08	2.47%	High	$7.25
$1,760,000	$1,032,000	2.5%	$66,200	$16,550	$2,000,000	$9,248,000	0.0%	$462,400	$115,600	$1,558,000	$2,218,750	$70.41	2.45%	High	$7.18

***Bolded Row is the Staff Recommendation**

Date Received: May 1, 2018
Date to be presented to the WQB: December 03, 2018

WATER QUALITY BOARD
FEASIBILITY REPORT FOR WASTEWATER TREATMENT PROJECT
AUTHORIZATION

APPLICANT: City of South Salt Lake
220 E Morris Avenue, #200
South Salt Lake, UT 84115
Telephone: 801-483-6000

PRESIDING OFFICIAL: Cherie Wood, Mayor
City of South Salt Lake
220 E Morris Avenue, #200
South Salt Lake, UT 84115
Telephone: 801-483-6000

TREASURER/RECORDER: Kyle Kershaw, Finance Director
City of South Salt Lake
220 E Morris Avenue, #200
South Salt Lake, UT 84115
Telephone: 801-464-6756

CONSULTING ENGINEER: N/A (see CVWRF)

BOND COUNSEL: Chapman & Cutler
215 S State Street
Salt Lake City, UT 84111
Telephone: 801-533-0066

APPLICANT'S REQUEST:

The City of South Salt Lake (City) is requesting hardship financial assistance from the Utah Water Quality Board in the amount of $11,248,000. This financing would cover South Salt Lake's share of the Central Valley Water Reclamation Facility (CVWRF) project.

APPLICANT'S LOCATION:

The City of South Salt Lake is located in the center of the Salt Lake Valley, as shown in Figure 1. Figure 1 also shows the location of Central Valley Water Reclamation Facility (CVWRF). The City is one of seven member entities that own the Central Valley Water Reclamation Facility (CVWRF). The City's sewerage system serves about half of the City's population (as shown in Figure 2) with the remainder served by Mt. Olympus SSD.

MAP OF APPLICANT'S LOCATION

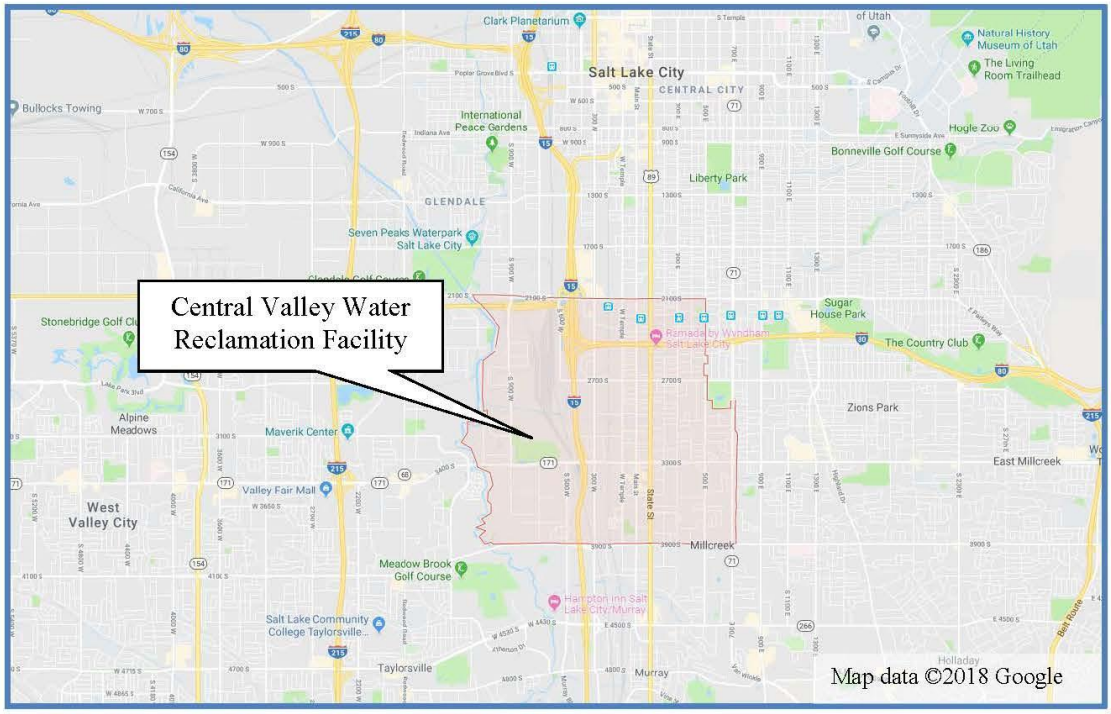


Figure 1: Location of South Salt Lake City Limits and CVWRF

MAP OF APPLICANT'S SERVICE AREA

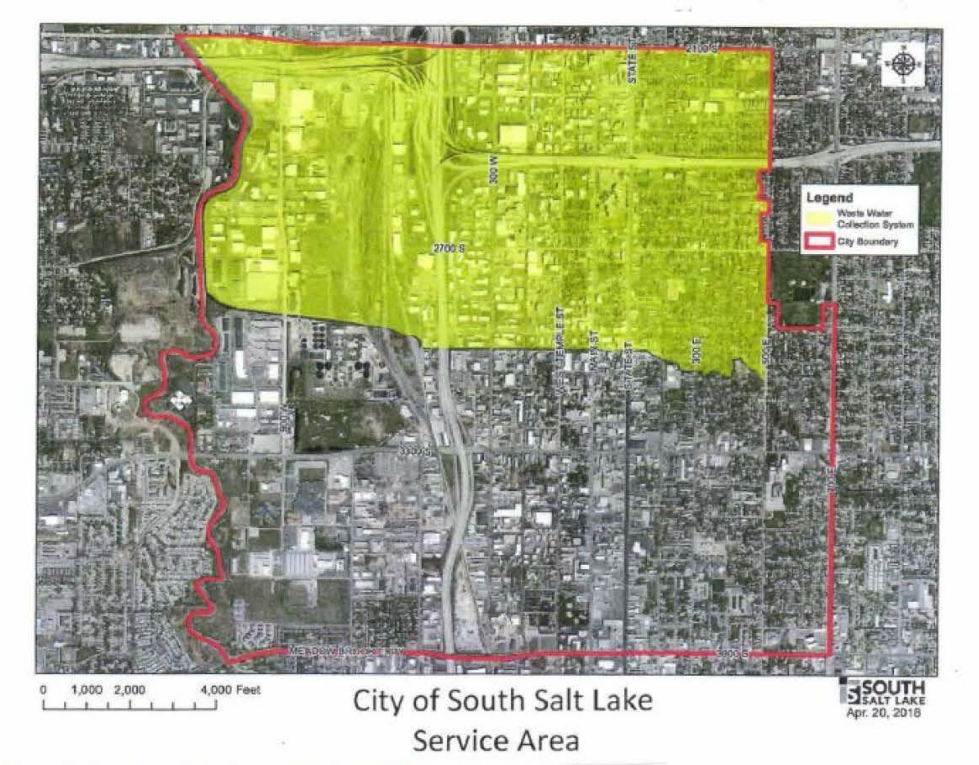


Figure 2: Portion of City Treated by CVWRF, Source: South Salt Lake WQB Application

BACKGROUND:

South Salt Lake is one of seven member entities that own the CVWRF. The WQB heard from the CVWRF in the April Board meeting regarding their request for financial assistance to upgrade the treatment plant and comply with the Technology Based Phosphorous Effluent Limit (TBPEL) UAC R317-1-3.3 rules. As a CVWRF member entity, the City owns a pro-rata share of the facility that is based on its usage and demand on the facility. The CVWRF treats wastewater for over 500,000 people in Salt Lake County. The City is the smallest member entity with only 2,600 connections in the system. South Salt Lake's ownership share is approximately 6.29%, adjusted annually. The City is therefore responsible to fund approximately 6.29% of the cost of the CVWRF, including capital improvements.

The City also owns and operates its own wastewater collection system. The collection system is approximately 35 miles of line and three lift stations. The City has about 60% of their collection system as clay pipe in fair condition and 40% plastic pipe in good condition. The City employs three staff and provides equipment, materials, and supplies to maintain the collection system that serves approximately 2,600 connections. The City limits are largely developed. Growth in the City often comes from installation of high density housing. The City reported that last year only two new residential and one new commercial units were connected to the collection system. The

City is currently updating its Utah Sewer System Management Program (SSMP) and Capital Facility Plan.

At the May 23, 2018 introduction to the board for South Salt Lake City (the City) the question was raised by a board member regarding the potential merger with the City and Mt. Olympus Improvement District's wastewater collection systems. A copy of the letter from the City to the Water Quality Board is included in the packet as Attachment 2. The letter details how they have met with Mt Olympus and both entities are interested in continuing to investigate the possibility as there would be benefits to the potential merger. However, there are a number of complicated issues that need to be addressed that will take significant time to resolve.

South Salt Lake City is in compliance with the Utah Sewer Management Program general permit UTG580015. DWQ is working with the City to develop an enforceable compliance agreement to address deficiencies in the municipal separate storm sewer system (MS4) program. The City Council passed a resolution on November 14, 2018 that resolves to identify a sustainable funding source to provide adequate resources to achieve compliance with the MS4 permit and to seek financial assistance from the Water Quality Board (see Attachment 3).

PROJECT NEED:

Central Valley discharges wastewater into Mill Creek, then the Jordan River, which has been identified as impaired for Dissolved Oxygen (DO) and Total Dissolved Solids (TDS) based on the 2004-303(d) assessment process as defined in the Clean Water Act. Central Valley also cannot reduce phosphorus to 1mg/l TBPEL with its current facility. This project will significantly reduce phosphorus and total nitrogen discharges to the lower Jordan River system, and bring the CVWRF into compliance with the TBPEL requirements.

The City, as a member entity of CVWRF, is obligated to participate in the funding of the CVWRF capital improvement plan. South Salt Lake stated in their application that they recognize the importance of the project and have shown their support by taking steps to increase rates to fund the first phase of the improvements.

The City has endeavored to accommodate as many of these improvement costs as possible by passing the costs onto the South Salt Lake rate payers. Since the CVWRF's Board voted to undertake its capital improvement plan, the increasing costs of CVWRF treatment is causing hardship on the City's CVWRF sewer customers. The City increased the user rates in 2016 for initial CVWRF improvements and is underway approving an additional rate increase to fund the 2017 Bond associated with phase one of this project. With only half of the City connected to the collection system to CVWRF, as shown in Figure 3, it is difficult for the City to pass any general obligation bonds or tax subsidies. Such city wide measures would result in the non-CVWRF treatment portion of the City subsidizing the connected portion. The large cost of the project, in addition to its timing, will result in hardship for the City's CVWRF sewer customers by WQB metrics. The City is seeking funding for additional assistance apart from CVWRF's WQB application in an attempt to ease the financial burden of the CVWRF project on its sewer customers.

PROJECT DESCRIPTION:

Currently, major process changes and facility improvements are being designed that will be constructed and in service by 2025. These improvements are in response to aging infrastructure issues of the original plant, which is now 30 years old, and a new rule from the State of Utah Division of Water Quality (DWQ) governing discharges of phosphorus. Central Valley's treatment process will be upgraded to a state-of-the-art biological nutrient removal (BNR) process and all major mechanical and electrical systems will be rehabilitated or replaced, so that the facility can successfully serve the public for the next 30 years. In the next 20 years, Central Valley expects to invest over $300 million in capital improvement projects that will upgrade, replace, and renew its wastewater infrastructure.

CVWRF has implemented a multi-phase Capitol Improvement Program to upgrade the existing facility infrastructure to address aged treatment systems and meet TBPEL. Phase one of the project consisted of replacing old infrastructure and addition of clarifiers to the facility. The total cost of phase one was approximately $58,000,000, of which South Salt Lake's share was $3,200,000. The City participated with other CVWRF entities to issue debt to fund phase one of the project. Phase two of the project is the construction of facilities to treat nutrients. The total cost of phase two is approximately $177,000,000. CVWRF has applied to the WQB for financial assistance amounting to about 45% of its project, which would be a loan of $81,100,000.

South Salt Lake is seeking financial hardship assistance to fund 100% of the City's portion of the CVWRF project, with requested funding of $11,248,000. This is not part of the $81,100,000 being requested by CVWRF.

ALTERNATIVES CONSIDERED

As discussed in the CVWRF memo:

The following alternatives were evaluated to determine the preferred alternative for Central Valley:

Alternative 1a:	Chemical phosphorus (P) removal
Alternative 1b:	Chemical P removal and tertiary denitrification filters
Alternative 2a:	Full biological nutrient removal (BNR) activated sludge
Alternative 2b:	BNR activated sludge and chemical P removal
Alternative 3:	BNR activated sludge preceded with trickling filters

Alternative 2a was selected as the preferred alternative. Central Valley proposes a phased biological treatment approach starting with an anaerobic/oxic (A/O) process mode, for meeting an effluent phosphorus limit of 1 mg/L. In addition, side stream nutrient removal would be provided on the biosolids dewatering process filtrate to minimize nutrient recycling and reduce the overall size of the mainstream treatment process.

POSITION ON PROJECT PRIORITY LIST:

This (Central Valley) project is ranked 3rd of 8 projects on the Wastewater Treatment Project Priority List.

POPULATION GROWTH:

Table 1 shows the current and projected populations for the entirety of South Salt Lake City, as shown on Figure 1. The city's sewer service covers about half of these residents.

Table 1: Population Projections for Entire South Salt Lake City (U.S. Census Bureau, City of South Salt Lake Planning Department)

Year	Residents*
2010	23,617
2018	24,575
2020	28,200

*Total City population, including sewer customers served outside of CVWRF

PUBLIC PARTICIPATION AND DEMONSTRATION OF PUBLIC SUPPORT:

South Salt Lake has taken or been part of the following steps to include the public in the proposed project:

1. July 2016, South Salt Lake City Council presented the need for the CVWRF improvements as well as the financial impact on rate payers.
2. April 2017, South Salt Lake City Council presented the CVWRF capital plan and City's funding responsibilities.
3. Second Quarter 2018, South Salt City's Council adopted an increased $7 per 1,000 gallon user rate to fund the 2017 bond for $3,500,000 associated with Phase 1 of the CVWRF project.

IMPLEMENTATION SCHEDULE:

Apply to WQB for Funding:	March 4, 2018
WQB Introduction	April 18, 2018
WQB Funding Authorization:	December 3, 2018
Facility Plan Approval:	December 2018
Issue Construction Permit	October 2019
Bid Opening	November 2019
Complete Construction	June 2024
Complete Commissioning	December 2024

FISCAL SUSTAINABLITY REVIEW:

South Salt Lake City has participated in the State of Utah Municipal Wastewater Planning Program self-assessment report (MWPP) since 2002. DWQ staff reviewed the City's MWPPs and found that the City follows many industry best practices relevant managing its sewer assets:

- Has and maintains an asset management and a preventative maintenance program
- Maintains a Plan of Operations
- The City has completed a rate study in the last 5 years
- The City charges impact fees and has completed an Impact Fee Analysis report within the last five years.
- The City uses a separate enterprise sewer account for sewer funds and maintains a Capital Improvements reserve fund
- The City Updates its Capital Facility plan regularly
- The City reported zero overflows last year for to the SSMP
- The overall system is considered to be in fair to good condition

These financial and record keeping procedures demonstrate to staff that the City takes an active role in understanding and maintaining their sewer assets. Staff also reviewed the sewer enterprise accounts from 2014 to 2017 focusing on O&M charges. The City is currently in good standing with Utah State Auditor. The City currently has two other existing sewer debts with a total of $311,500 due annually:

- $61,500 annually until 2022 - DWQ 2002 Loan for CVWRF improvements
- $250,000 annually until 2037 - Phase I CVWRF upgrade 2017 Bond

Staff's analysis of the City's collection system management found that the City's sewer enterprise is fiscally sustainable as evidenced by:

- The City has consistently set user fees and impact fees in planning their infrastructure improvements
- The City uses a separate enterprise account its sewer funds
- The City's continued participation in the MWPP since 2002

APPLICANT'S CURRENT USER CHARGE:

The 2016 median adjusted gross income (MAGI) for South Salt Lake is $30,521, which is 68% of the state average MAGI. The City raised the wastewater user charge in February of 2016 from $3.50 per 1,000 gallons of winter use to the $5 per 1,000 gallons and again in July 2018 to $7 per 1,000 gallons. The City's rate structure results in the average user charge of approximately $42/month/ERU, which is 1.65% of their MAGI (Note: a 1.4% average monthly user charge would be $35.61/month/ERU).

COST ESTIMATE:

The estimated cost of South Salt Lake's portion of the project is based on the City's pro-rata ownership in CVWRF. Staff developed the model using the City's current portion of 6.29% share of the total CVWRF project amount, plus closing costs. Staff prepared a static cost model

for this assistance package, summarized in Table 2 and in detail in Attachment 1. The cost model was developed to show how South Salt Lake's assistance request would fit into the overall financing of CVWRF's capital project financing.

Table 2: Static Cost Model Example at 0%

CVWRF Project Cost	**$177,059,000**
South Salt Lake's Percent	**6.29%**
South Salt Lake's Portion	**$11,137,000**
South Salt Lake's Loan Origination	**$111,000**
South Salt Lake's Loan Total Cost	**$11,248,000**

COST SHARING:

Phase two of the project is expected to cost $177,059,000. South Salt Lake City is responsible for approximately 6.29% of the CVWRF total project, as shown in Table 3.

Table 3: Cost Sharing of South Salt Lake for CWVRF's WQB Financial Assistance

Funding Source	Cost Sharing	Percent of Project
Total Other CVWRF Member Portion	$165,922,000	93.71%
South Salt Lake Portion	$11,137,000*	6.29%
Total CVWRF Project	**$177,059,000**	**100%**

*Plus South Salt Lake's closing costs estimated at $111,000 bring the total South Salt Lake request to $11.25 million as shown in Table 2

It is worth noting that Central Valley intends to fund the balance of its 20 year, $300 million investment through member contributions and public market financing which will further increase user rates for it member entities. This is not included in the current cost model.

ESTIMATED ANNUAL COST FOR SEWER SERVICE:

Staff developed cost models to evaluate several financing alternatives for the project. The basic cost data used in modeling financial alternatives for the project are provided below:

Operations and Maintenance (O&M) – Annual	$500,000
Existing Debt – Annual	$311,521
Median Adjusted Gross Household Income (2016)	$30,521
Maximum Affordable Sewer Rate at 1.4 % MAGI	$35.61

The static cost model shows that the current user rates are above the Board's affordability criteria of 1.4% of MAGI, i.e., a loan at any interest rate will increase the rate further above 1.4% of MAGI. Current market rates (from 11/16/18) index as follows:

US 20-year Treasury Bond[1]	3.25%
US 30-year Treasury Bond[1]	3.35%
MBIS Municipal Bond Index, 20-year[2]	3.524%

1. U.S. Department of The Treasury https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield
2. EMMA Municipal Securities and Rulemaking Board. https://emma.msrb.org/ToolsAndResources/MarketIndicators

The static cost model shows that the City would need to charge $64.57 for a 0% interest rate loan for 20 years which would result in a MAGI of 2.54% without additional subsidy.

STAFF COMMENTS:

This upgrade to the CVRWF is an important water quality project that will allow the largest water reclamation facility in the State to come into compliance with the TBPEL, improve flexibility to meet anticipated future requirements, and improve overall water quality discharged from the reclamation facility.

South Salt Lake is requesting separate consideration, rather than combined assistance with the CVWRF request, to provide additional subsidy to the South Salt Lake City CVWRF customers. South Salt Lake City's request for financial assistance should be considered by the Board in conjunction with CVWRF request. The $11,248,000 request for South Salt Lake City's portion of the project is not included in the $81.1 million funding request from the Board by CVWRF.

Without separate more favorable terms for South Salt Lake City, the City's user cost approaches 2.7% of MAGI as shown in the highlighted row of Attachment 1. Even with a loan of $9,248,000 at an interest rate of 0% repayable over 20 years, and principal forgiveness of $2,000,000, user cost would still be 2.36% (It should be noted that the maximum principal forgiveness for one cap grant year is between $2M and $2.5M). At 2.36% of MAGI, staff believes South Salt Lake City's customers will face one of, if not the highest sewer bills in the state relative to MAGI.

As noted above, the WQB expressed concern that South Salt Lake should explore joining with Mt. Olympus. This has potential benefits to South Salt Lake City and they are committed to pursuing this further. However, this will not be resolved in the necessary time frame to keep the project on track to meet its variance deadline.

STAFF RECOMENDATION:

Staff recommends that the Board authorize funding to South Salt Lake City **for a loan of $9,248,000 at an interest rate of 0% repayable over 20 years, and principal forgiveness of $2,000,000** subject to the following special conditions:

1. South Salt Lake City must agree to participate annually in the Municipal Wastewater Planning Program (MWPP).
2. South Salt Lake City must pursue and retain any additional funding necessary to fully implement the project.
3. South Salt Lake City must develop and implement an asset management program that is consistent with EPA's Fiscal Sustainability Plan guidance.

DWQ-2018-011041
File: South Salt Lake City, Admin, Section 1

South Salt Lake City (CVWRF) Supplemental Funding - Authorization
January 26, 2021
Attachment 2 – South Salt Lake City December 2018 Feasibility Report- Authorization

South Salt Lake City (CVWRF) Feasibility Report - Authorization
October 24, 2018
Attachment 1- Cost Model

ATTACHMENT 1

South Salt Lake City - Water Quality Board

20 Year Loan Static Cost Model (Member Entity Portion of CVWRF Improvements)

CVWRF Total Project Cost	$177,059,000
South Salt Lake City's portion	6.29%

Project Costs	
South Salt Lake Portion of Proj	$11,137,000
Loan Origination Fee	$111,000
Total Project Cost:	$11,248,000

Project Funding	
Cash from member entities	$ 21,104,665
Central Valley WQB Loan	$ 81,100,000
Publicly issued bonds@3%	$ 63,717,335
South Salt Lake WQB Loan	**$ 11,248,000**
Total Project Cost:	$177,170,000

Current Customer Base & User Charges	
Current (ERU):	2,621
MAGI (2016 CITY):	$30,521
Sewer Impact Fee (per ERU):	$1,063
Monthly User Fee (per ERU):	$42.00
1.4% MAGI UserFee	$35.61

Projected Annual Sewer O&M Cost	
Estimated Operating Expenses:	$1,000,000

Funding Conditions	
Loan Repayment Term:	20 years
Reserve Funding Period:	6 years

ESTIMATED COST OF SEWER SERVICE UNDER STRAIGHT-LINE AMORTIZATION

WQB Grant Amount	WQB Loan Amount	WQB Loan Interest Rate	WQB Loan Debt Service	WQB Loan Reserve	Annual Sewer O&M Cost	Existing Sewer Debt Service	Total Annual Sewer Cost	Monthly Sewer Cost/ERU	Sewer Cost as a % of MAGI
$11,248,000	$ -	0.0%	$0	$0	$1,000,000	$311,500	$1,311,500	$41.70	1.64%
$3,000,000	$8,248,000	0.0%	$412,400	$103,100	$1,000,000	$311,500	$1,827,000	$58.09	2.28%
$2,000,000	**$9,248,000**	**0.0%**	**$462,400**	**$115,600**	**$1,000,000**	**$311,500**	**$1,889,500**	**$60.08**	**2.36%**
$1,000,000	$10,248,000	0.0%	$512,400	$128,100	$1,000,000	$311,500	$1,952,000	$62.06	2.44%
$0	$11,248,000	0.0%	$562,400	$140,600	$1,000,000	$311,500	$2,014,500	$64.05	2.52%
$0	$11,248,000	0.5%	$592,392	$148,098	$1,000,000	$311,500	$2,051,990	$65.24	2.57%
$0	$11,248,000	1.0%	$623,311	$155,828	$1,000,000	$311,500	$2,090,639	$66.47	2.61%
$0	$11,248,000	1.5%	$655,148	$163,787	$1,000,000	$311,500	$2,130,435	$67.74	2.66%
$0	$11,248,000	1.8%	$674,686	$168,671	$1,000,000	$311,500	$2,154,857	$68.51	2.69%
$0	$11,248,000	2.0%	$687,891	$171,973	$1,000,000	$311,500	$2,171,363	$69.04	2.71%

Bolded Row is Staff Recommendation, Highlighted Row is if they receive the same rate as recommendation for Central Valley

SOUTH SALT LAKE CITY ON THE MOVE

July 17, 2018

Utah Water Quality Board
Utah Department of Environmental Quality
195 N 1950 W
Salt Lake City, UT, 84114

Re: Waste Water Systems Merger

Dear Board Members,

At the May 23, 2018 Utah Water Quality Board meeting the City of South Salt Lake requested financial assistance for its share of costs related to upcoming projects at the Central Valley Water Reclamation Facility (CVWRF). During the presentation a question was raised by a board member regarding the potential merger of South Salt Lake's waste water system with Mt. Olympus Improvement District's (District) system. Since that time South Salt Lake staff has researched this idea and has collected information relevant to this issue. Also, City staff has met with Mt. Olympus management to discuss a potential merger and collect additional information.

It should be noted that the idea of consolidation has been raised in the past by both entities. Nearly 25 years ago discussions were undertaken to ascertain the feasibility of a merger. At that time the Salt Lake Suburban Sanitary District #1 (now Mt. Olympus Improvement District) determined a merger would not be in the best interest of their rate payers. This decision was made based upon the district's perception that South Salt Lake's infrastructure and billing system had shortcomings.

Additional discussions took place in the early 2000's. This effort was short-lived due to a disagreement over water rights when water reuse programs were being discussed. The latest discussions took place in approximately 2004. An extensive analysis was conducted to ascertain the condition of South Salt Lake's system. The District determined that due to pump stations, which are a part of South Salt Lake's system, it would be cost prohibitive to operate. Also, South Salt Lake was unable to transfer the amount of cash reserves to the District to compensate for the disparity in system infrastructure.

Though a consolidation never occurred, South Salt Lake's relationship with the District has remained positive and collegial. South Salt Lake and the District work together on many issues particularly as they pertain to the CVWRF. Both entities hold Board seats in that organization.

At this time we can report to the Utah Water Quality Board that there is potential that the two systems could consolidate at a future time. There is no animus or philosophical reasons why the systems could not consolidate. Due to the proximity of the systems, dual membership in the CVWRF, the District providing service to 50% of South Salt Lake residents and businesses, and the potential for economies of scale makes the idea of a merger logical to both entities.

There are a number of issues identified by both entities that would need to be addressed before a consolidation could occur. Some of these issues are:

Condition and make-up of the infrastructure – over the past several years, as funding has allowed, South Salt Lake has renovated and updated its collection system, however, the District would want to ensure their current ratepayers are not financially burdened by the acquisition of a substandard or expensive (pump stations) system.

CHERIE WOOD
MAYOR

220 E MORRIS AVE
SUITE 200
SOUTH SALT LAKE CITY
UTAH
84115
O 801.483.6000
F 801.483.6001

Billing structure differences – the District bills their customers on an Equivalent Residential Unit (ERU) basis while South Salt Lake bills based on winter water usage. These two methods would need to be reconciled.

Property tax assessment – the District levies a property tax as a part of their system's financial plan. South Salt Lake operates its waste water utility as an enterprise fund which is financially sustained by user fees.

Reserve (cash) funds – there is a significant difference, even on a pro-rata basis, in the amount of reserved cash balances between the two organizations. Some type of funds transfer from South Salt Lake would be required.

CVWRF ownership – currently both the District and South Salt Lake have ownership interests in the CVWRF. The CVWRF was created by interlocal agreement between seven entities and any change in ownership and board representation would require the amendment of the agreement. This would require the five other member entities approve any change in ownership makeup. This process, with its associated legal review, would take a long time to complete.

As mentioned earlier we believe there is a potential to merge the two systems at some point. We will endeavor to continue discussions with officials at the Mt. Olympus Improvement District. Officials at the District have committed the same.

We appreciate the recommendation from the Water Quality Board to explore this idea and appreciate your support. Please contact me or my staff if you require additional information.

Cordially,

Cherie Wood

Cherie Wood, Mayor

RESOLUTION NO. 2018-19

Attachment 3

A RESOLUTION OF THE SOUTH SALT LAKE CITY COUNCIL EXPRESSING ITS COMMITMENT TO IDENTIFY A SUSTAINABLE REVENUE SOURCE TO ADEQUATELY FUND THE CITY'S STORM WATER OBLIGATIONS.

WHEREAS, the City of South Salt Lake ("City") owns and operates a storm water collection system which has been developed over many years and consists of a network of natural conveyances and manmade structures and conduits that collect, control and route storm water runoff; and

WHEREAS, the City is required to protect the waterways within its jurisdiction from polluted storm water in accordance with the requirements set forth in the Jordan Valley Municipalities Municipal Separate Storm Sewer System Permit ("MS4 Permit") issued by the State of Utah Department of Environmental Quality Division of Water Quality; and

WHEREAS, in order to meet the requirements of the MS4 Permit the City shall identify adequate resources for the operation, maintenance, and infrastructure needs of the storm water collection system,

NOW, THEREFORE, BE IT RESOLVED by the City of South Salt Lake City Council that the City Council acting as the budgetary arm of the City is committed to identifying a sustainable funding source to provide adequate resources to achieve compliance with the MS4 permit in an effort to promote and improve water quality.

BE IT FURTHER RESOLVED, by the City of South Salt Lake City Council that the City Council encourages the Mayor to seek funding through the Clean Water State Revolving Fund managed by the Utah Water Quality Board in an amount of $2.2 million for eligible capital storm water projects in South Salt Lake and to pursue a planning advance to detail analysis of storm water needs.

APPROVED AND ADOPTED by the City Council of the City of South Salt Lake, Utah, on this 14th day of NOVEMBER, 2018.

BY THE CITY COUNCIL:

Ben B. Pender, Council Chair

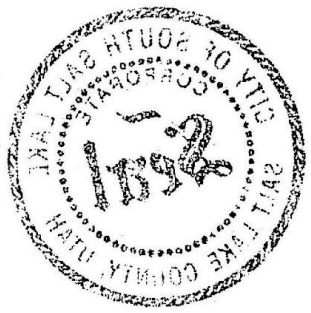
Council vote as recorded:

Bynum	YES
deWolfe	YES
Kindred	ABSTAIN
Mila	YES
Pender	YES
Siwik	YES
Thomas	YES

CITY OF SOUTH SALT LAKE CORPORATE Seal SALT LAKE COUNTY, UTAH

ATTEST:

Craig D. Burton, City Recorder


CITY OF SOUTH SALT LAKE
CORPORATE
SEAL
SALT LAKE COUNTY, UTAH

State of Utah

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF WATER QUALITY
Erica Brown Gaddis, PhD
Director

TO: Utah Water Quality Board

THROUGH: Erica Brown Gaddis, PhD

FROM: Beth Wondimu, P.E. and Ken Hoffman P.E.

DATE: January 26, 2022

SUBJECT: Millville City's Refinance for Funding of New Wastewater Collection System

In April 2021, the Water Quality Board authorized $4,500,000 in funding as principal forgiveness and $500,000 in 30-year 0% loan. In addition, the Board authorized funding for a $1,000,000 Hardship Block Grant to Millville for the construction of laterals and septic tank abandonment to be distributed to hardship qualifying residents. The US Department of Agriculture-Rural Development (USDA-RD) also authorized loan and grant funding in support of the project. USDA-RD authorized two funding packages: USDA-RD Package 1 is a loan of $5,011,000 with an interest rate of 1.5% and a 40-year term and a grant of $2,949,000 and USDA-RD Package 2 is a loan of $9,700,000 with an interest rate of 1.75% and a 40-year term and a grant of $6,400,000. USDA-RD Package 2 includes the funding of private laterals. The previous Board Authorization memo dated on April 28, 2021 is attached to this memo. At the time of estimation, the total cost of the project was $14.3 million. The project was bid during March 2021. The lowest bid was $25,931,777 for construction work with a project total of $30,060,000.

APPLICANT'S REQUEST

Millville City is requesting additional assistance to reduce the estimated monthly rate below $100 per month per ERU. A user rate of $100/month/ERU is 2.03% of MAGI.

PROJECT NEED

The proposed project consists of a new sewerage system with a new pump station and force main that connects to Hyrum City's existing treatment systems. Millville is the second largest unsewered community in the State of Utah. Millville's plan to implement a public sewerage system will protect a valuable regional drinking water resource and contribute to orderly growth in the area. The

recommended alternative would connect the city's sewer to the regional wastewater treatment plant in Hyrum City, linking the regional needs for water quality protection.

PROJECT DESCRIPTION

See Page 2 of the attached Authorization Report.

POSITION ON PROJECT PRIORITY LIST

Millville City is currently ranked No. **6** of 8 on the FY 2021 Wastewater Treatment Project Priority List (PPL).

APPLICANT'S CURRENT USER CHARGE

Currently, Millville City charges $2.00 per month per ERU to service the debt on their portion of the Nibley trunk line connecting to Logan. The impact fee is $2,450.

COST ESTIMATE

The total cost of the project is estimated to be $30,060,000. A breakdown of these costs is as follows.

	Collection	Laterals
Legal/Bonding	$ 42,000	
DWQ Loan Origination Fee	$ 5,000	
Collection Sewers	$ 22,657,757	
Laterals		$ 1,887,900
Septic Tank Abandonment		$ 1,386,120
Engineering, CMS, & Environmental	$ 1,100,000	$ 350,000
Contingency (approx. 10% const.)	$ 2,299,018	$ 332,205
Subtotals	$ 26,103,775	$ 3,956,225
Total Project Cost:		**$ 30,060,000**

ESTIMATED ANNUAL COST FOR SEWER SERVICE

Different funding options result in different annual sewer costs. A cost model is shown in Attachment 1, which analyzes several possible funding options. With the new project cost and the previous Board and USDA-RD authorizations, Millville's ratepayers will pay $115.19 or 2.33% of the MAGI towards their sewer bills. The Utah Water Quality Board's State Affordability Criterion of 1.4% of MAGI ($59,200 for Millville City) or $69.07 per month for the City will be exceeded by the project allowing for the consideration of grant funds as part of a funding package. Based on the Financial Burden Evaluation Policy for the Utah Wastewater Project Assistance Program, the community has a Financial Burden of: **High**.

STAFF COMMENTS

Millville has reached agreeable terms and interlocal agreements with Hyrum for service at $31.86/month with no impact fee for current residents. A total of $30.5 million is needed to complete this project. Currently, the project is fully funded with a project user rate of $115.70 per month. The City is requesting the Board consider additional assistance to reach a rate of no more than $100/month.

Due to limitations of how USDA-RD funding works the only way staff has identified to bring additional assistance to Millville is to authorize a refinance of USDA-RD's Package 1 after funds have been fully drawn and disbursed. USDA-RD has stated to staff this would be acceptable for the WQ Board to do. Finally, Millville currently has a UWLF outstanding debt for the construction of the Nibley line to Logan of $151,768 which the City pays $2/month per ERU on.

Staff developed static cost models (Attachment 1) to evaluate scenarios for supplemental funding by the Board. Staff request will fulfill the needed funding to complete construction of the project.

STAFF RECOMMENDATION

Staff recommends **the Board authorize a refinance of the $5,011,000 USDA-RD loan comprised of $3,750,000 million in principal forgiveness and $1,261,000 of loan at 0% for a term of 30 years after completion of drawing USDA-RD funds. In addition, staff recommends the Board authorize $151,768 from the Hardship Grant Fund to pay off the existing UWLF debt.** This is subject to the following special conditions:

1. Millville must agree to participate annually in the Municipal Wastewater Planning Program (MWPP).
2. As part of the facility planning, Millville must complete a Water Conservation and Management Plan.
3. Millville must pursue and retain remaining funding necessary to fully implement the collection system project.
4. Millville must develop and implement an asset management program that is consistent with EPA's Fiscal Sustainability Plan guidance.
5. The hardship grant funds will be awarded only after the award of the construction contract.
6. The refinance and hardship grant fund authorizations will expire on May 14, 2022 if the City has not has awarded the construction contract by that date.
7. Staff may negotiate with the City an escalating principal repayment schedule.

Water Quality Board - Millville City – Additional Funding Request
January 26, 2022
Attachment 1

Attachment 1 - STATIC COST MODEL - Millville

Project Costs	Collection	Laterals
Legal/Bonding	$ 42,000	
DWQ Loan Origination Fee	$ 5,000	
Collection Sewers	$ 22,657,757	
Laterals		$ 1,887,900
Septic Tank Abandonment		$ 1,386,120
Engineering, CMS, & Environmental	$ 1,100,000	$ 350,000
Contingency (approx 10% const.)	$ 2,299,018	$ 332,205
Subtotals	$ 26,103,775	$ 3,956,225
Total Project Cost:		**30,060,000**

Project Funding	Collections	Laterials
Applicant Contribution		$ -
WQB Principle forgiveness for Collections	$ 2,000,000	
WQB Loan	$ 500,000	
WQB Principle forgiveness for Collections	$ 2,500,000	
WQB Hardship Grant - for lateral		$ 1,000,000
RD funding - 2020 loan	$ 5,011,000	
RD funding - 2020 grant	$ 2,949,000	
RD funding - 2021 loan	7,926,265	1,773,735
RD funding - 2021 grant	5,217,510	1,182,490
Total Project	**$ 26,103,775**	$ 3,956,225

Existing Sewer Debt Service (UWLF)	$151,768
UWLF Existing Debt Payment	$16,128
Current Monthly User Fee (per ERU)	$2.00

WQB Funding Conditions

Loan Repayment Term:	30
Reserve Funding Period:	6
2021 Loan interest rate	0%

Current Customer Base & User Charges

ERU's	672
MAGI (2020):	$59,200
Monthly Rate at 1.4%	$69.07
Impact Fee (per ERU):	2,450
Existing O&M expenses Treatment & Collection	$0
New O&M expenses Treatment & Collection	$334,495

RD 2020 Series Loan to Refinance

Loan Repayment Term:	40
2020 Loan interest rate	1.50%

RD 2021 Series Loan (includes Lateral Funding)

Loan Repayment Term:	40
2021 Loan interest rate	1.75%

RD Reserve		Per Month
Short Lived Asset Reserve (annual)	16,400	2.03
Bond Payment Reserve (BPR) Loan 1	167,503	2.08
Bond Payment Reserve (BPR) Loan 2	339,229	4.21
Reserve Funding Period (years)	10	

ESTIMATED COST OF SEWER SERVICE* (Lateral on private property ARE included in the cost model but only paid for under the 2021 DWQ HGF and 2021 RD Package)

2021 WQB			2022 WQB Refinance			2020 USDA-RD		2021 USDA-RD		Loan Debt	Assumed RL	Total Annual	Monthly Sewer	Sewer Cost as a	Financial
HGF	Loan	PF	HGF	Loan	PF	Grant	Loan	Grant	Loan *	Service	Reserve	Sewer Cost	Cost/ERU	% of MAGI	Burden
Current Deal															
1,000,000	**500,000**	**4,500,000**				2,949,000	5,011,000	6,400,000	9,700,000	527,566	50,673	928,862	115.19	2.33%	Medium
DWQ Refinance															
1,000,000	500,000	4,500,000	151,768	5,011,000	0	2,949,000	0	6,400,000	9,700,000	568,854	33,923	937,272	116.23	2.36%	Medium
1,000,000	500,000	4,500,000	151,768	4,011,000	1,000,000	2,949,000	0	6,400,000	9,700,000	527,188	33,923	895,605	111.06	2.25%	Medium
1,000,000	500,000	4,500,000	151,768	3,011,000	2,000,000	2,949,000	0	6,400,000	9,700,000	485,521	33,923	853,939	105.90	2.15%	Medium
1,000,000	500,000	4,500,000	151,768	2,011,000	3,000,000	2,949,000	0	6,400,000	9,700,000	443,854	33,923	812,272	100.73	2.04%	Medium
1,000,000	500,000	4,500,000	151,768	1,761,000	3,250,000	2,949,000	0	6,400,000	9,700,000	433,438	33,923	801,855	99.44	2.02%	Medium
1,000,000	500,000	4,500,000	151,768	1,511,000	3,500,000	2,949,000	0	6,400,000	9,700,000	423,021	33,923	791,439	98.14	1.99%	Medium
1,000,000	**500,000**	**4,500,000**	**151,768**	**1,261,000**	**3,750,000**	**2,949,000**	**0**	**6,400,000**	**9,700,000**	**412,604**	**33,923**	**781,022**	**96.85**	**1.96%**	**Medium**
1,000,000	500,000	4,500,000	151,768	1,011,000	4,000,000	2,949,000	0	6,400,000	9,700,000	402,188	33,923	770,605	95.56	1.94%	Medium
1,000,000	500,000	4,500,000	151,768	761,000	4,250,000	2,949,000	0	6,400,000	9,700,000	391,771	33,923	760,189	94.27	1.91%	Medium
1,000,000	500,000	4,500,000	151,768	511,000	4,500,000	2,949,000	0	6,400,000	9,700,000	381,354	33,923	749,772	92.98	1.88%	Medium
1,000,000	500,000	4,500,000	151,769	261,000	4,750,000	2,949,000	0	6,400,000	9,700,000	370,938	33,923	739,355	91.69	1.86%	Medium

State of Utah
SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF WATER QUALITY
Erica Brown Gaddis, PhD
Director

ATTACHMENT 2

MEMORANDUM

TO: Utah Water Quality Board

THROUGH: Erica Brown Gaddis, PhD
Executive Secretary

FROM: Ken Hoffman, Manager, P. E. & Beth Wondimu
Engineering Section

DATE: April 28, 2021

SUBJECT: Additional Funding Request - Millville City – New Wastewater Collection System Including House Laterals and Septic Tank Abandonment

In March 2020, the Water Quality Board (the Board) authorized a construction assistance funding package in a principal forgiveness grant of $2,000,000 to support for Millville City's (Millville) design and construction of a new sewerage collection system to connect every home within municipal boundaries and a hardship grant of $1,500,000 for assistance in construction of house laterals and septic tank abandonment. Staff's report provided to the Board for this authorization is provided in Attachment 2. The United State Department of Agriculture, Rural Development (USDA-RD) also authorized loan and grant funding in support of the project. USDA-RD authorized a loan of $5,011,000 at an interest rate of 1.5% percent for a 40-year term and grant of $2,949,000 for the project. The total estimated cost at that time was $14.3 million. The city will self-fund the remaining $3,575,000 needed to pay for abandonment of existing septic systems and to run sewer laterals to the new community sewer system.

In April 2021, Millville bid the sewer project and the lowest bid came in over the original construction estimate. Three bids were received in the amount of: $26.9, $31.8, and $34.0 million. These bids are good for 60 days or until May 25, 2021. All the bids have been reviewed by Franson Engineering and the costs have been compared. The analysis of the bids indicated that higher costs are:

- Due to higher pipe material costs ($51.50 per LF)
- Higher labor costs due to market conditions
- Higher cost of manhole materials ($28,634 per connection)
- Higher cost of excavation of depth (due to deep sewers) to install lift station

Due to these increased bids, Franson Engineers re-evaluated the alternatives to construct a new Millville City collection system and connect to either Hyrum City's or Logan City's existing treatment systems. Using the increased materials, labor, and excavation cost of the $26.9 million bid plus Logan impact fees, Franson Engineers estimate the cost to connect to Logan would be $27.8 million. Therefore, connection to the Hyrum Treatment plant is still considered the preferable alternative for Millville City. In addition, Franson Engineers are examining the bids for any saving which can be realized for reduction in work of to be completed as future projects. One such item the project as bid, included a pair of 10" and 12" force mains from the lift station to connect to Hyrum by eliminating the 10" force main Millville can save $700,000. Last, Franson Engineers are examining the plans for any collection system which could be deferred and required for future development. Franson Engineers are currently looking at connections outside the 300 ft zone of influence of the city well with increasing levels of nitrate. Franson Engineers should have this information at the time of the Board meeting. A comparison of the original cost estimate with today's cost estimate is given in Table 1. The summary of their analysis is as follows:

Table 1 – TOTAL PROJECT COST

Item	**March 2020 Budget**		**April 2021 Budget**	
	Collections	**Laterals**	**Collections**	**Laterals**
Legal/Bonding, Loan Origination	$ 0		$ 0	
Construction – Collections	$ 4,896,000		$15,768,595	
Construction – Pressure Line	$ 1,530,000		$5,763,182	
Laterals		$ 3,150,000		$2,700,000
Septic Tank Abandonment		$ 630,000		$1,000,000
Engineering CMS & Environmental	$1,100,000	$ 350,000	$1,100,000	$ 350,000
Contingency (25% - 2020; 15% 2021)	$ 1,607,000	$ 945,000	$3,229,767	$555,000
Subtotals	$9,225,000	$5,075,000	$25,861,544	$4,605,000
Total Project Costs:		**$ 14,300,000**		**$30,466,544**

A total of $30.5 million is needed to fund the project. The city is requesting supplemental funding from both the Water Quality Board and from USDA-RD. The USDA-RD has stated Millville could apply for a cost overrun authorization to make up the additional funding and has given a potential indication of a 25%/75% for grant/loan ratio with a loan term of 40 years at around 1.75%. USDA-RD does not fund any of the private lateral work.

In March 2020, Board authorized $1,500,000 for laterals and $2,000,000 for principal forgiveness for collection sewer. As required by the Board authorization, Millville developed a Hardship Lateral Grant Program and accepted application in Fall 2020 and 154 qualified applicants applied. At this time, Millville request to utilize $1 million out of $1.5 million for laterals and asks the Board to reauthorize the remaining $500,000 towards the collection system funding. Note staff feels this would be best conducted by unauthorizing $500,000 in Hardship Grant funds and authorizing additional principle forgiveness funds. In addition, Millville is requesting the Board consider authorization of additional principle forgiveness funding.

Staff developed static cost models (Attachment 1) to evaluate scenarios for supplemental funding by the Board for additional principal forgiveness. It is important to note the cost model is examining the cost of the collection system project and is not evaluating the costs of the construction of private laterals. The construction costs of private laterals will have to be paid by individual home owners. Included in the cost model is additional projected USDA-RD funding. The static models show that in all cases, the sewer rates with current funding will exceed $70.58 per month per ERU or 1.4% in the 2019 MAGI. This project continues to qualify for consideration of grant funding to part of a funding package.

Staff Comments

Staff supports Millville's plan to implement a public sewerage system that will protect a valuable regional drinking water resource and contribute to orderly growth in the area. The recommended alternative would connect the city's sewer to the regional wastewater treatment plant in Hyrum City, linking the regional needs for water quality protection.

Financing the project is challenging because of the high cost of pressure system and collection systems at present. Current growth and rising costs support the need for planning and constructing a public sewerage system now. Staff is hopeful the projected growth in the community which this system will also serve can help reduce the monthly costs, however growth is never guarantied.

At this time the Hardship Grant fund is heavily obligated so staff believes returning $500,000 of funding to this account and instead authorizing it as additional principal forgiveness would be valuable to the Board. Since this project is already being constructed under the requirements of first round funding, staff recommends the Board consider bringing additional principal forgiveness funding to the project. The Capitalization Grant funds available for principal forgiveness are shown below in Table 2.

TABLE 2: Capitalization Grant Funds Available as Principal Forgiveness			
	Minimum	Maximum	Balances
FY17	$695,600 (met)	$2,086,800	$1,108,800
FY 18	$844,300	$2,532,900	$2,532,900
FY 19	$844,300	$2,532,900	$2,532,900
FY 20	$835,800	$3,343,200	$3,343,200
PROJECTED FY21	$835,700	$3,342,800	Not available at this time
	Authorized	**Drawn**	
Provo	$2,000,000	$0	-$2,000,000
South Salt Lake	$2,000,000	$0	-$2,000,000
Millville	$2,000,000	$850,000	-$1,150,000
		Total Available for Authorization	**$4,367,800**

Staff recommends including some amount of 0% loan as this will keep the project under standard bond council review. Staff is highly concerned about the escalating costs of this project, examining the attached cost model staff believes a funding package focused on 2.8% of MAGI is an appropriate goal for the Board to consider this results in a $500,000 loan at 0% for a 30-year term and $2,500,000 in additional principal forgiveness. This potential funding package would bring overall $5,500,000 in grant from the Board and $500,000 in loan. A funding comparison of the authorized and requested

funding is shown in Table 3 below. This cost sharing estimate assumes RD can fund 100% of the funding gap for the project.

TABLE 3 - PROJECT FUNDING COMPARISON			
Funding Source	**March 2020 Originally**	**Additional WQB & RD, Funding**	**April 2021 Total**
LATERALS			
Local Contribution	$ 3,575,000		$ 3,605,000
WQB Hardship Grant	$ 1,500,000	(-$500,000)	$1,000,000
COLLECTION SYSTEM			
USDA-RD Loan	$ 5,011,000	$12,948,543 loan & grant	$20,908,544
USDA-RD Grant	$ 2,949,000		
WQB Loan	$0	$500,000	$500,000
WQB Principal Forgiveness Grant	$ 2,000,000	$ 2,500,000	$4,500,000
Total Project Costs:	$ 14,300,000	$15,948,544	$30,513,544

Staff Recommendations

Staff recommends to the Board to: **Unauthorized $500,000 of the Hardship Grant funding from the March 2020 funding package for private laterals. Authorized an additional $3,000,000 in total funding including $500,000 as loan for 30 years at 0% interest and $2,500,000 in principal forgiveness subject to the following special conditions:**

1. Millville must agree to participate annually in the Municipal Wastewater Planning Program (MWPP).
2. As part of the facility planning, Millville must complete a Water Conservation and Management Plan.
3. Millville must pursue and retain remaining funding necessary to fully implement the collection system project.
4. Millville must develop and implement an asset management program that is consistent with EPA's Fiscal Sustainability Plan guidance.

Attachment 1 - STATIC COST MODEL - Millville

Project Costs	Collection	Laterals
Legal/Bonding	$ 42,000	
DWQ Loan Origination Fee	$ 5,000	
Collection Sewers	$ 15,768,595	
Pressure System	$ 5,763,182	
Laterials		S 2,700,000
Septic Tank Abandonment		S 1,000,000
Engineering, CMS, & Environmental	$ 1,100,000	S 350,000
Contingency (approx 15% const. cost)	$ 3,229,767	S 555,000
Subtotals	$ 25,908,544	S 4,605,000
Total Project Cost:		**30,513,544**

Current Customer Base & User Charges	
ERU's	672
MAGI (2019):	$60,500
Affordable Monthly Rate at 1.4%	$70.58
Current Impact Fee (per ERU):	TBD
Current Monthly User Fee (per ERU)	$2.00
Existing O&M expenses Treatment & Collection	$0
New O&M expenses Treatment & Collection	$339,789
Existing Sewer Debt Service	$15,000

Project Funding	Collections	Laterials and Septic
Applicant Contribution		$ 3,605,000
RD funding - Original loan	S 5,011,000	
RD funding - Original grant	S 2,949,000	
WQB Principle forgiveness Grant - Orgial	S 2,000,000	
WQB Hardship Grant - for lateral		S 1,000,000
WQB Hardship Grant - for general project cost	S 500,000	
Additional Funding need	S 15,448,544	
Total Project	**$ 25,908,544**	S 4,605,000

Funding Conditions	
WQB Loan Repayment Term:	30
Reserve Funding Period:	6
USDA-RD Loan Repayment Term:	40

ESTIMATED COST OF SEWER SERVICE* (Lateral on private property are NOT included in the cost model)

2020 WQB Principal Forgiveness	2020 RD Grant Amount	2020 RD Loan Amount	**2021 WQB Principal Forgiveness**	**2021 WQB Loan**	**2021 POTENTIAL RD Grant Amount***	**2021 POTENTIAL RD Loan Amount***	Loan Debt Service	Assumed RD Reserve	Total Annual Sewer Cost	Monthly Sewer Cost/ERU	Sewer Cost as a % of MAGI
2,000,000	2,949,000	5,011,000	**0**	**500,000**	3,862,136	11,586,408	593,537	259,707	1,208,033	149.81	2.97%
2,000,000	2,949,000	5,011,000	**500,000**	**500,000**	3,737,136	11,211,408	580,423	259,707	1,194,919	148.18	2.94%
2,000,000	2,949,000	5,011,000	**1,000,000**	**500,000**	3,612,136	10,836,408	567,308	259,707	1,181,804	146.55	2.91%
2,000,000	2,949,000	5,011,000	**1,500,000**	**500,000**	3,487,136	10,461,408	554,194	259,707	1,168,689	144.93	2.87%
2,000,000	2,949,000	5,011,000	**2,000,000**	**500,000**	3,362,136	10,086,408	541,079	259,707	1,155,575	143.30	2.84%
2,000,000	**2,949,000**	**5,011,000**	**2,500,000**	**500,000**	**3,237,136**	**9,711,408**	**527,965**	**259,707**	**1,142,460**	**141.67**	**2.81%**
2,000,000	2,949,000	5,011,000	**3,000,000**	**500,000**	3,112,136	9,336,408	514,850	259,707	1,129,346	140.05	2.78%
2,000,000	2,949,000	5,011,000	**0**	**1,000,000**	3,737,136	11,211,408	601,256	259,707	1,215,752	150.76	2.99%
2,000,000	2,949,000	5,011,000	**500,000**	**1,000,000**	3,612,136	10,836,408	588,142	259,708	1,202,638	149.14	2.96%
2,000,000	2,949,000	5,011,000	**1,000,000**	**1,000,000**	3,487,136	10,461,408	575,027	259,709	1,189,525	147.51	2.93%
2,000,000	2,949,000	5,011,000	**1,500,000**	**1,000,000**	3,362,136	10,086,408	561,913	259,710	1,176,411	145.88	2.89%
2,000,000	2,949,000	5,011,000	**2,000,000**	**1,000,000**	3,237,136	9,711,408	548,798	259,711	1,163,298	144.26	2.86%
2,000,000	2,949,000	5,011,000	**2,500,000**	**1,000,000**	3,112,136	9,336,408	535,684	259,712	1,150,184	142.63	2.83%
2,000,000	2,949,000	5,011,000	**3,000,000**	**1,000,000**	2,987,136	8,961,408	522,569	259,713	1,137,071	141.01	2.80%
2,000,000	2,949,000	5,011,000	**0**	**2,000,000**	3,487,136	10,461,408	616,694	259,714	1,231,196	152.68	3.03%
2,000,000	2,949,000	5,011,000	**500,000**	**2,000,000**	3,362,136	10,086,408	603,579	259,715	1,218,083	151.05	3.00%
2,000,000	2,949,000	5,011,000	**1,000,000**	**2,000,000**	3,237,136	9,711,408	590,465	259,716	1,204,969	149.43	2.96%
2,000,000	2,949,000	5,011,000	**1,500,000**	**2,000,000**	3,112,136	9,336,408	577,350	259,717	1,191,856	147.80	2.93%
2,000,000	2,949,000	5,011,000	**2,000,000**	**2,000,000**	2,987,136	8,961,408	564,236	259,718	1,178,742	146.17	2.90%
2,000,000	2,949,000	5,011,000	**2,500,000**	**2,000,000**	2,862,136	8,586,408	551,121	259,719	1,165,629	144.55	2.87%
2,000,000	2,949,000	5,011,000	**3,000,000**	**2,000,000**	2,737,136	8,211,408	538,007	259,720	1,152,515	142.92	2.83%

* MODEL ASSUMPTION: RD will be able to fully fund the Collection System Project at a 75%/25% Loan/Grant ratio with a 40 year 1.75% loan terms.

ATTACHMENT 3

WATER QUALITY BOARD
FEASIBILITY REPORT FOR SEWERAGE PROJECT
INTRODUCTION

APPLICANT:	Millville City 510 E 300 E Millville, UT 84326 Telephone: (435) 750-0924
PRESIDING OFFICIAL:	David Hair, Mayor
TREASURER/RECORDER:	Corey Twedt, Recorder
CONSULTING ENGINEER:	Chad Brown, Engineer Franson Civil Engineers 115 Golf Course Rd Suite D Logan, UT, 84321 (435) 754-7661
BOND COUNSEL:	Eric Johnson, Partner Blaisdell Church & Johnson, LLC 5995 South Redwood Rd. Salt Lake City, UT 84123 (801) 261-3407

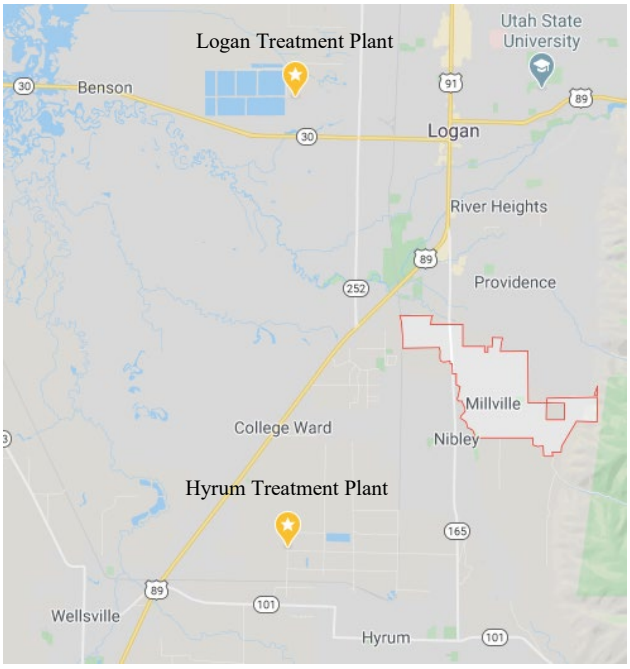
APPLICANT'S REQUEST:

Millville City is requesting financial assistance from the Utah Water Quality Board in the amount of $12,300,000 to construct a new sewerage system. The City is also requesting a planning advance from the Utah Water Quality Board in the amount of $694,500.

APPLICANT'S LOCATION:

Millville City is located in Cache County. The City is approximately 7 miles from the Logan Treatment Plant and approximately 5 miles from the Hyrum Treatment Plant.

MAP OF APPLICANT'S LOCATION



BACKGROUND AND PROJECT NEED:

Since at least 1993, elevated concentrations of nitrate have been detected in in the drinking water aquifer that supplies Millville City's drinking water (USGS Publication Water-Resources Investigations Report 93-4221, 1994). Nitrate affects the ability of the body to carry oxygen, and is particularly harmful to infants and young children. The primary drinking water standard maximum contaminant level (MCL) for nitrate as nitrogen (NO3-N) is 10 mg/L.

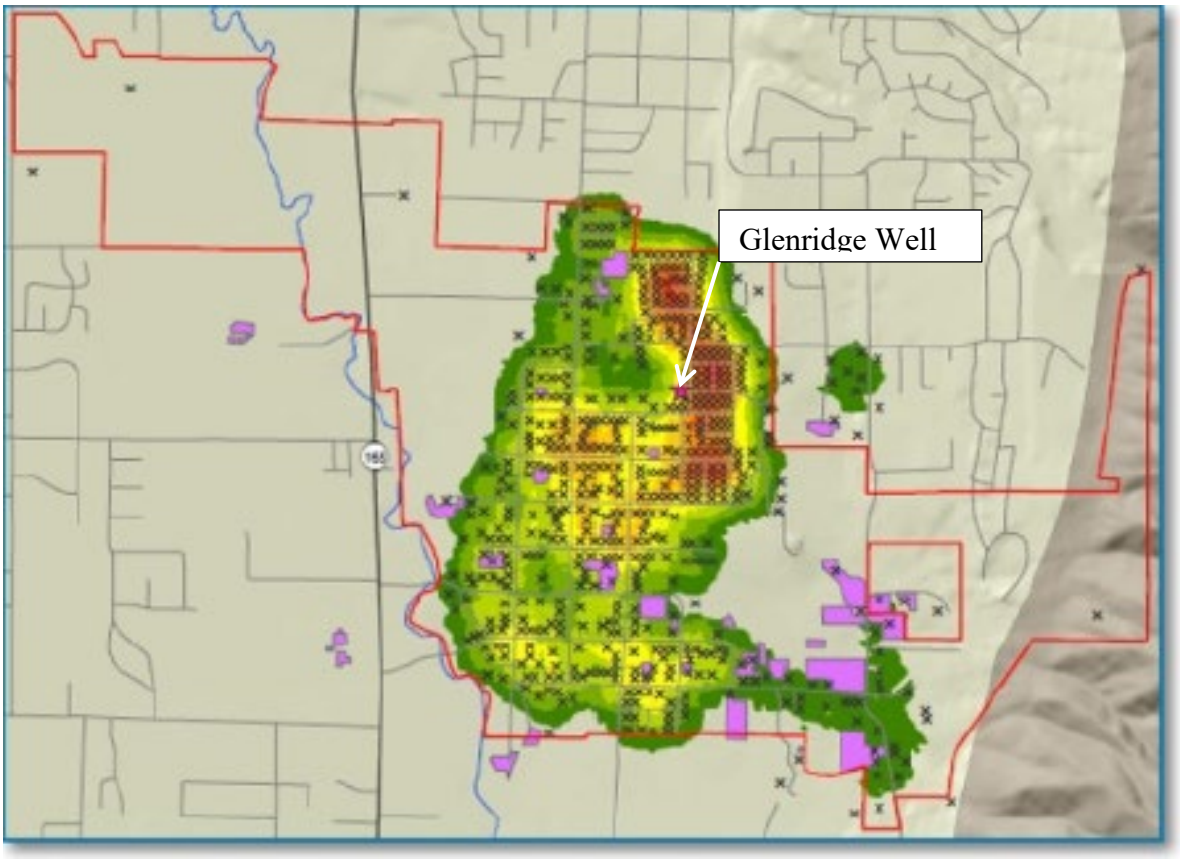
Nitrate concentrations on the City's Glenridge Well have increased steadily over the years In 1993, the ground water nitrate concentration was reported to be 3.3 mg/L and in Spring of 2019, a nitrate concentration of 8.8 mg/L was measured for the Glenridge Well.

The primary sources of nitrate to the aquifer are believed to be agricultural and septic tank discharges into the subsurface from individual homes. Since at least the year 2000, increases in ground water nitrate concentrations have tracked population growth in the City implicating septic tanks as the principal source of the continuing degradation of water quality.

Septic tanks discharge approximately 50 - 60 mg/L of nitrogen into the subsurface, most of which becomes oxidized to nitrate in the shallow soils. There are a variety of site conditions that

allow septic discharges to be protective of water supplies and acceptable means for wastewater disposal. Conditions such as fast draining soils, and shallow, unconfined aquifers, increase the probability of contamination reaching the water supply. Under these conditions, as at Millville City, as the number of septic discharges increase over an aquifer, so does the risk to ground water contamination In these cases, the housing density affects a community's ability to protect their water supply.

A septic density study completed for Cache Valley in 2003 (UGS Special Study 101, 2003) suggested that a density of three acres per home would limit ground water degradation to 1 mg/L. Today, the housing density in parts of Millville City is approximately one half acre per home, exceeding the UGS study recommendation by six times. An overlay of the City's housing on the ground water map depicting nitrate is illustrative of the impacts that septic tanks appears to have had on the ground water.



In the 1980s and 1990s, most of southern Cache Valley was sewered. The Water Quality Board authorized a loan for $7.7 million for the cities of Nibley and Millville to connect to the Logan Wastewater Treatment Plan in 2001. Millville later elected to withdraw from the agreement to sewer before the loan closed leaving this city as the only remaining community in the area to rely on septic tanks for sewage treatment. The Water Quality Board also authorized a loan $3.5 million loan in 1989 for Providence City to connect with Logan and a $4.2 million loan to H in 2003 to construct a new treatment plant.

Concern over rising nitrate concentrations in the Glenridge Well led the city to apply for an aquifer storage and recovery (ASR) permit in 2018 with the hope of diluting the nitrate in the aquifer with spring water and thereby extending the life of the well. A pilot test for this concept was conducted in 2014 and the results were considered when reviewing the city's ASR application. The Division's review of the ASR application was conducted in partnership with the Division of Drinking Water. The Division denied the permit for the ASR project for the following three reasons:

1) Based on pilot study results, we were concerned that the project could push the nitrate plume downgradient to the Providence City drinking water wells. There is evidence that this occurred during the pilot as concentrations in one of Providence City's wells (Alder-West Well) increased from 4.5 mg/L to 8.6 mg/L following the two pilot tests. Concentrations came down to 5.9 mg/L after 22 months.
2) The pilot project did not demonstrate that long term operation of the project would produce the intended results to dilute nitrate concentrations.
3) The city had not made any attempt to reduce their contribution to the nitrate problem through source control (sewer of the city).

The Bear River Health Department (BRHD) administers the septic permitting program in Cache Valley. Following the Division's denial of the aquifer storage and recovery project, BRHD made the decision to put a moratorium on any further septic permitting in the area. Although DEQ does not have authority to issue such a moratorium, the Division was consulted by the BRHD before this action was taken and we were supportive of the decision because limiting additional nitrate sources in the area would help mitigate public health risks associated with the nitrate contamination.

As a result of the Division's ASR permit denial and the Board of Health's moratorium, Millville has moved swiftly to develop plans to sewer the community

Millville City is estimated to have a current population of 2,050 with 630 culinary connections, 10 of which are commercial. Millville is a growing community and projects to reach buildout in the next 30-40 years with a population of 6,646 and 2,014 residential connections.

PROJECT DESCRIPTION:

The proposed project consists of four principal parts: (1) constructing 15.6 miles of new sewerage system that will provide sewer service throughout the community; (2) connecting the new sewerage system to a regional wastewater treatment facility; (3) connecting private properties to the sewerage system; and (4) properly decommissioning the existing septic tanks.

About three years, sewer service was provided to the new Millville High School at the north east side of town. This line was sized to accommodate future connections from the remainder of the City. The line connects with the Nibley City sewerage system from which the wastewater is conveyed to the Logan City regional treatment plant. Both Nibley and Logan Cities have

indicated willingness to provide capacity to convey (Nibley) and treat (Logan) Millville's new discharge. Logan City was required by the Water Quality Board to implement impact fees for its service as a condition of a Board loan to Logan. Logan's impact fee of $2,300 per connection amounts to a project cost of approximately $1.6 million. As an alternative, Millville City has been negotiating with Hyrum City to try and establish a mechanism to defer this cost and regionalize the Hyrum system, probably with a new district being formed. These two alternatives are discussed further below.

Funding laterals and septic tank decommissioning on private property is generally prohibited under our loan program for two principal reasons. Under the SRF and Utah statute, funding a treatment works (and sewerage system) project means we are funding public assets and their improvement with public dollars. These laws are generally silent on what cannot be funded but have been interpreted as meaning that this funding (category) cannot directly benefit private properties beyond the public benefit. The second reason is one of practicality. Doing work on someone else's property is difficult at best, even with access agreements in place.

Because of the high cost of sewering the community and the hardship that will result, the City asked staff to review the possibility of providing financial assistance toward constructing the private house laterals and decommissioning of septic tanks. USDA Rural Development, who is expected to be a financing partner on this project, indicated that these parts of the project are not eligible for funding under their wastewater project loan program. Having reviewed the ground water situation in Millville City, our rules for funding, and the challenges associated with implementing such a project (on private properties), we believe this could be done within the constraints of the law, EPA and program guidance, and to the benefit of many home owners in the City.

Whereas the legal framework discussed above limits funding for "treatment works" to public projects, the same legal framework for "nonpoint source" projects opens financial assistance to both private and public entities. Within Utah Administrative Code R317, Environmental Quality, Water Quality, Rule R317-101, Utah Wastewater Project Assistance Program, Part 5, Financial Assistance for Onsite Wastewater Systems, there is an allowance for providing assistance for laterals and septic tank decommissioning to connect homes to sewer. Hardship criteria specified in this rule must be met for each homeowner receiving assistance. We estimate that 40 to 60 percent of these homeowners

ALTERNATIVES EVALUATED:

In addition, to the conventional sewer system Millville evaluated alternative collection systems. For treatment Millville evaluated constructing a Millville treatment plant or forming a new Sewer District with a regional treatment plant. The largest alternative still being evaluated is whether to flow to the Logan or Hyrum Treatment Plant, Millville is currently in discussions with both facilities.

Millville intends to construct approximately 15.6 miles of new sewer to connect to the Nibley

gravity main. Capacity is available in this line and during its construction Millville purchased capacity in the gravity main through Nibley to the Nibley pump station, and from there into Logan. This purchase did not include purchase into the treatment plant. If Millville connects to Hyrum they will need to build a pressure line to deliver the wastewater to Hyrum. In addition, to the sewer construction Millville City or the home owners will be constructing laterals to connect the sewer to residences and abandoning septic tanks.

POSITION ON PROJECT PRIORITY LIST:

This project is ranked 4th out of 7 projects on the Wastewater Treatment Project Priority List. 4th is the highest currently unfunded project.

POPULATION GROWTH:

Millville is estimated with a population of 2,050 and 630 culinary connections, 10 of which are commercial. Millville is a growing community and projects to reach buildout in the next 30-40 years with a population of 6,646 and 2,014 residential connections.

PUBLIC PARTICIPATION AND DEMONSTRATION OF PUBLIC SUPPORT:

In a letter dated March 14, 2019, Mayor Hair reached out to residents notifying them of the elevated nitrate levels and potential for a sewer project. Millville held a public hearing on September 23, 2019 on the City Council resolution to issue $15 million dollars of Water and Sewer Revenue Bonds. During the hearing the sewer project was introduced and public comment was invited. Based off the meeting minutes the public is supportive of the project but encouraged Millville staff to exhaust options other than connecting to Logan.

IMPLEMENTATION SCHEDULE:

The proposed schedule for implementation of the construction project is as follows:

WQB Introduction	February 2020
WQB Funding Authorization:	March 2020
Start Construction	2020
Complete Construction	2023

APPLICANT'S CURRENT USER CHARGE:

Millville currently has approximately a $2/month user charge. This fee pays for the capacity Millville previously purchased in the gravity main through Nibley to the Nibley pump station, and from there into Logan. In addition, with the construction of the sewer system Millville will have to maintain the new sewer which is estimated to cost approximately $9 per household.

In order to get the wastewater treated Millville will need to send the wastewater to Logan

Wastewater Treatment Plant or the Hyrum Wastewater Treatment Plant. Millville is approximating what treatment fees would be based off what Logan charges Nibley as a customer which is approximately $22.50/month. In addition, Millville would have to pay Logan impact fees of $2,500/connection. Millville is negotiations with Hyrum also for treatment. Hyrum has indicated they are open to bringing Millville on as a partner and potentially charging $29/month with no impact fee. For cost modeling we will use the $29/month potential fee.

The 2017 median adjusted gross income (MAGI) for Millville City is $55,905, which is 22 percent higher that the state average of $45,895. Based on the Board's affordability criterion of 1.4% MAGI, potential grant funding should be considered for a sewer bill of greater than $65.22.

COST ESTIMATE:

Millville has estimated this project to have 2 major cost components: 1. Laterals and Septic Tank Abandonment, and 2. Sewer Construction. Cost Component 1 to construct laterals and septic tank abandonment on private property is estimated to be approximately $3.4 million or approximately $5,400 per household. Based off staff interpretation of rule the construction of laterals and septic tank abandonment are only eligible to be funded under the Utah Wastewater Project Assistance Program within the Financial Assistance for Onsite Wastewater Systems Program (OWS Program) under UAC R317-101-5. Only those residents with a total household income of no greater than 150% of the State MAGI would be eligible under the OWS Program. Based on the magnitude of this project the only manageable approach for this funding would be grant funding due to the encumbered requirements of loan funding.

Cost Component 2 of the project is the sewer line construction going to Hyrum. The estimated cost of Millville collection system project construction is outlined in the following table:

Item	Funded Project Cost
Legal/Bonding	$ 50,000
DWQ Loan Origination	$ 55,000
Environmental	$ 50,000
Construction – Collections	$ 4,396,000
Construction – Pressure Line	$ 1,551,000
Engineering, CMS	$ 1,346,000
Contingency (20%)	$ 1,869,000
Total	$ 9,254,000

EFFORTS TO SECURE FINANCING FROM OTHER SOURCES:

Millville is in the process of applying for construction assistance from both the Community Impact Board (CIB) and USDA Rural Development (RD). Early discussion has indicated neither CIB nor RD could fund laterals or impact fees. Further, CIB has indicated as Cache County is not a major producing county they would likely only be able to bring loan to the project. Meanwhile, RD may

be able to bring a mix of loan and grant and has given indication the project would rank highly and bring a 30/70 or 40/60 grant/loan mix.

COST SHARING:

Millville has estimated funding through the sale of a $15 million bond for Water and Sewer projects on the open market as possible at 5.5% with a 40 year term. Millville is examining the possibility of funding all cost components so residents are not faced with any large bills and costs are instead wrapped into monthly payments. Staff modeled a 30 yr 5.5% loan which results in a $138/month sewer bill or 3.0% of MAGI so without assistance Millville would be one of the highest rates in the State.

Staff prepared a cost model for evaluation of possible loan terms and affordability. Static Model 1 (Attachment 1) presents a 30 year loan approach. This model is using the $29/month Hyrum treatment fee and does not include the cost of construction of laterals. This model shows that for the proposed Sewer Construction project of $9.2 million would require a $5.0 million loan at 0% and $4.3 million in grant to reach a 1.4% of MAGI Monthly User Fee.

STAFF COMMENTS AND RECOMMENDATION:

Staff supports the Millville collections project. It is an important project for Millville in order to protect the community's drinking water source and to plan for the future in their service area. Further, based on Static Model 1 this project will be very challenging for the community to keep affordable and the Water Quality Board is urged to do all they can to aid this community.

Staff has two recommendations:

Staff recommends that the Board direct staff to prepare two packages for presentation for Authorization at the next Board meeting: 1. Hardship Grant Authorization for construction of laterals and septic tank abandonment, and 2. Wastewater Project Authorization for the construction of the sewer project.

Staff recommends that the Water Quality Board authorize a **$694,500 Advance to the Millville City** for the design of the sewer system which would then be rolled into the future funding for larger project which needs to be completed. It is recommended that this funding is subject to these special conditions:

1. The City must agree to participate annually in the Municipal Wastewater Planning Program (MWPP).

2. As part of the facility planning, the City must complete a Water Conservation and Management Plan.

3. The City must pursue and retain additional funding if necessary to fully implement this project.

4. The City must provide a Plan of Operation consistent with R317-101-3 Q.

5. The City must provide a schedule for remaining necessary construction as identified in the engineering report prior to start of construction.

6. If milestones provided by the City are not met applicant must repay advance within 1 year of authorization.

7. The advance will be rolled into the first project identified in the schedule and funding will be subject to that financial evaluation.

SPECIAL COSIDERATIONS:

Staff has no more additional special conditions than those listed above for the Design Advance.

Attachments: Millville City Static Cost Model 1
U:\ENG_WQ\0-Projects\Millville\Millville Feasibility Report.docx
DWQ-2020-004306
File: Millville City, Admin, Section

STATIC COST MODEL 1 - Millville 30 year loan

Project Costs

Legal/Bonding	$	50,000
DWQ Loan Origination Fee	$	42,000
Collection Sewers	$	4,396,000
Pressure Line	$	1,551,000
Engineering	$	1,346,000
Contingency (approx 20% const. cost)	$	1,869,000
Total Project Cost:	$	9,254,000

Current Customer Base & User Charges

ERU's	672
MAGI (2017):	$55,905
Affordable Monthly Rate at 1.4%	$65.22
Current Impact Fee (per ERU):	TBD
Current Monthly User Fee (per ERU)	$2.00
Existing O&M expenses Treatment & Collection	$0
New O&M expenses Treatment & Collection	$303,856
Existing Sewer Debt Service	$15,000

Funding Conditions

Loan Repayment Term:	30
Reserve Funding Period:	6

ESTIMATED COST OF SEWER SERVICE

WQB Grant Amount	WQB Loan Amount	WQB Loan Interest Rate	WQB Loan Debt Service	WQB Loan Reserve	Annual Sewer O&M Cost	Existing Sewer Debt Service	Total Annual Sewer Cost	Monthly Sewer Cost/ERU	Sewer Cost as a % of MAGI
-	9,254,000	5.50%	636,725	159,181	303,856	15,000	1,114,762	138.24	2.97%
-	9,254,000	0.00%	308,467	77,117	303,856	15,000	704,439	87.36	1.88%
500,000	8,754,000	0.00%	291,800	72,950	303,856	15,000	683,606	84.77	1.82%
1,000,000	8,254,000	0.00%	275,133	68,783	303,856	15,000	662,773	82.19	1.76%
1,500,000	7,754,000	0.00%	258,467	64,617	303,856	15,000	641,939	79.61	1.71%
2,000,000	7,254,000	0.00%	241,800	60,450	303,856	15,000	621,106	77.02	1.65%
2,500,000	6,754,000	0.00%	225,133	56,283	303,856	15,000	600,273	74.44	1.60%
3,000,000	6,254,000	0.00%	208,467	52,117	303,856	15,000	579,439	71.86	1.54%
3,500,000	5,754,000	0.00%	191,800	47,950	303,856	15,000	558,606	69.27	1.49%
4,000,000	5,254,000	0.00%	175,133	43,783	303,856	15,000	537,773	66.69	1.43%
4,500,000	**4,754,000**	**0.00%**	**158,467**	**39,617**	**303,856**	**15,000**	**516,939**	**64.10**	**1.38%**
5,000,000	4,254,000	0.00%	141,800	35,450	303,856	15,000	496,106	61.52	1.32%

State of Utah

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Kimberly D. Shelley
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DIVISION OF WATER QUALITY
Erica Brown Gaddis, PhD
Director

TO: Utah Water Quality Board

THROUGH: Erica Brown Gaddis, PhD

FROM: Andrew Pompeo

DATE: January 26, 2022

SUBJECT: Payson City's Reauthorization for Funding of WWTP Upgrades

At the January 27, 2021 Water Quality Board Meeting, Payson City requested funding assistance for a $24,000,000 construction project upgrades at their wastewater treatment plant. These upgrades will allow Payson City WWTP to remove phosphorus and nitrogen to meet the Technology Based Effluent Phosphorus Limit (TBPEL) and future Utah Lake nutrient standards. At the March 23, 2021 Board meeting, the Board authorized a loan for $11,500,000 at an interest rate of 1.11% over 20 years. Since the loan was authorized in March, Payson has hired a new engineering firm. Forsgren Engineering designed and constructed a similar project with Salem City and has now estimated the total cost of the project to be $57,085,000. This increase in cost is due to the recent market fluctuations that have hit the construction industry particularly hard.

APPLICANT'S REQUEST

Payson City is requesting additional funding from the Water Quality Board in the amount of **$10,000,000** in addition to the **$11,500,000** for which they were originally authorized. In addition to potential additional funding, Payson City is requesting that the interest rate of the previously authorized funding be re-evaluated. Further, Payson requested the funding be considered for a term of 30 years. These funds will be used for the modification of their water reclamation facility to bring it into compliance with the TBPEL.

PROJECT NEED

The existing wastewater treatment plant will not meet future and anticipated regulatory requirements for nutrients. The proposed Nutrient Removal Upgrade project will incorporate a modification and expansion of the existing facility to 5 mgd with redundancy. The expansion will provide capacity through 2058. The TBPEL of 1.0 mg/L effective in 2020 is the most pressing of these regulatory requirements. A variance granted to Payson City by the Division of Water Quality (DWQ) allows the WWTP to discharge phosphorus at a maximum of 3.9 mg/L from January 1, 2020 until January 1, 2025. During this time, Payson City will upgrade its WWTP to meet the TBPEL.

PROJECT DESCRIPTION

See Page 3 of the attached Payson's Feasibility Report: Authorization

POSITION ON PROJECT PRIORITY LIST

Payson City is currently ranked No. **4** of 8 on the FY 2021 Wastewater Treatment Project Priority List (PPL).

APPLICANT'S CURRENT USER CHARGE

Currently, Payson City charges approximately $42.58 per month per ERC. The impact fee is $2,066 and the hookup fee is $175.

COST ESTIMATE

The total cost of the project is estimated to be $57,085,000. A breakdown of these costs follows.

Land/Right-of-way	$	60,000
Legal/Bonding	$	140,000
DWQ Loan Origination Fee	$	230,000
Engineering - Design	$	1,927,000
CMGC Preconstruction Services	$	228,000
Engineering - CMS	$	2,500,000
Construction	$	42,300,000
Contingency (20%)	$	8,400,000
Escalation (3%)	$	1,300,000
Total Project Cost:	**$**	**57,085,000**

COST SHARING

The total cost of the project is $57,085,000, Payson City is contributing $2,155,000 of its own funds towards the project for Engineering Design and CM/GC Preconstruction services.

Funding Source	Cost Sharing	Percent of Project
Local Contribution	$2,155,000	3.8%
WQB Authorized Funding	$11,500,000	20.1%
Private Market Funding	$43,430,000	76.1%
Total Amount:	$57,085,000	100%

ESTIMATED ANNUAL COST FOR SEWER SERVICE

Different funding options result in different annual sewer costs. A cost model is shown in Attachment 1, which analyzes several possible funding options. The resulting Total Annual Sewer Cost is shown for each funding option.

With the new project cost, the previous Board authorized loan of $11,500,000, and the City funding the remaining needs on the private market, Payson's ratepayers will pay $64.38 or 1.71% of the MAGI towards their sewer bills. The Utah Water Quality Board's State Affordability Criteria of a user rate greater than 1.4% of MAGI ($45,100 for Payson City) or $52.62 per month will be exceeded by the project allowing for the

consideration of grant funds as part of a funding package. Based on the Financial Burden Evaluation Policy for the Utah Wastewater Project Assistance Program, the community has a Financial Burden of: **Medium**.

STAFF COMMENTS

Staff strongly supports this important project as it will allow Payson City to maintain compliance with Division of Water Quality discharge requirements. Specifically, it will make it possible for the plant to reduce the phosphorus that is discharged from the treatment facility and bring them into compliance with the TBPEL. In support of the project staff evaluated various funding alternatives including additional loan funds, rate change, and principal forgiveness funding. Within available funds Staff believes the following approach is most impactful. Adding $1 million in principal forgiveness funds demonstrates strong support from the Board for a project of Medium burden. Then, reducing the interest rate from 1.11% to 0.5% and increasing the loan amount by $2 million for a total of $13.5 million provides meaningful savings to Payson. Finally, Staff has discussed the requirements to evaluate the facility's usefully life that would enable a loan term of up to 30 years. An evaluation like this was conducted for the Salem facility upgrade and staff believes Payson's engineer can file appropriate documentation to justify a 30-year useful life for this project. The resulting funding package is $14.5 million with $13.5 million at 0.5% over 30 years and $1 million in Principal Forgiveness.

STAFF RECOMMENDATION

Staff recommends that **the Board re-authorize the previous funding package as a $13,500,000 at an interest rate of 0.5% repayable over 30 years plus $1,000,000 of additional funding as principal forgiveness** with the following special conditions:

1. Payson must agree to participate annually in the Municipal Wastewater Planning Program (MWPP).
2. Payson must pursue and retain remaining funding necessary to fully implement the project.
3. Payson must demonstrate an overall net or effective project useful life of 30 years or more. A shorter life will result in a reduced loan term.
4. Payson must develop and implement an asset management program that is consistent with EPA's Fiscal Sustainability Plan guidance.

Payson City
Reauthorization for Funding of WWTP Upgrades
January 26, 2022
Attachment 1

Attachment 1- Cost Model

Payson City - Water Quality Board
30 Year Loan Static Cost Model

Project Costs

Land/Right-of-way	$	60,000
Legal/Bonding	$	140,000
DWQ Loan Origination Fee	$	230,000
Engineering - Design	$	1,927,000
CMGC Preconstruction Services	$	228,000
Engineering - CMS	$	2,500,000
Construction	$	42,300,000
Contingency (20%)	$	8,400,000
Escalation (3%)	$	1,300,000
Total Project Cost:	**$**	**57,085,000**

Project Funding

Local Contribution	$	2,155,000
Amount to be Funded	**$**	**54,930,000**
WQB Grant	**$**	-
Total Project Cost:	**$**	**57,085,000**

Current Customer Base & User Charges

Initial Total Customer (ERU's)	8,200	
MAGI for Payson City (2020):	$45,100	
Affordable Monthly Rate at 1.4%	$52.62	
Impact Fee (per ERU):	$2,066	
Current Monthly Fee (per ERU)	$42.58	avg monthly bill
2025 Sewer Debt Service	$480,000	in year 2025
Annual O&M expense	$3,200,000	in year 2025

Funding Conditions

Loan Repayment Term:	30
Reserve Funding Period:	6

ESTIMATED COST OF SEWER SERVICE

Principal Forgiveness	WQB Loan	Private Loan Amount	WQB Loan Interest Rate	Private Loan Interest Rate*	WQB Loan Debt Service	WQB Loan Reserve	Private Loan Debt Service	Annual Sewer	Existing Debt Service	Total Annual Sewer Cost	Monthly Sewer Cost/ ERU	Sewer Cost as % of MAGI	Financial Burden
	11,500,000	43,430,000	1.11%	2.55%	452,798	113,200	2,088,841	3,200,000	480,000	6,334,839	64.38	1.71%	MEDIUM
	11,500,000	43,430,000	0.50%	2.55%	413,758	103,439	2,088,841	3,200,000	480,000	6,286,038	63.88	1.70%	MEDIUM
	11,500,000	43,430,000	0.75%	2.55%	429,504	107,376	2,088,841	3,200,000	480,000	6,305,721	64.08	1.71%	MEDIUM
1,000,000	11,500,000	42,430,000	1.11%	2.55%	452,798	113,200	2,040,744	3,200,000	480,000	6,286,742	63.89	1.70%	MEDIUM
2,150,000	11,500,000	41,280,000	1.11%	2.55%	452,798	113,200	1,985,433	3,200,000	480,000	6,231,431	63.33	1.68%	MEDIUM
1,000,000	**13,500,000**	**40,430,000**	**0.50%**	**2.55%**	**485,715**	**121,429**	**1,944,551**	**3,200,000**	**480,000**	**6,231,695**	**63.33**	**1.69%**	**MEDIUM**
1,000,000	13,500,000	40,430,000	1.00%	2.55%	523,100	130,775	1,944,551	3,200,000	480,000	6,278,425	63.81	1.70%	MEDIUM
1,000,000	13,500,000	40,430,000	1.11%	2.55%	531,546	132,886	1,944,551	3,200,000	480,000	6,288,983	63.91	1.70%	MEDIUM
	14,500,000	40,430,000	0.50%	2.55%	521,694	130,424	1,944,551	3,200,000	480,000	6,276,669	63.79	1.70%	MEDIUM
1,000,000	14,500,001	39,429,999	0.50%	2.55%	521,694	130,424	1,896,454	3,200,000	480,000	6,228,572	63.30	1.68%	MEDIUM
	16,500,000	38,430,000	0.50%	2.55%	593,652	148,413	1,848,357	3,200,000	480,000	6,270,423	63.72	1.70%	MEDIUM
	16,500,000	38,430,000	0.75%	2.55%	616,245	154,061	1,848,357	3,200,000	480,000	6,298,663	64.01	1.70%	MEDIUM
	16,500,000	38,430,000	1.11%	2.55%	649,667	162,417	1,848,357	3,200,000	480,000	6,340,441	64.44	1.71%	MEDIUM

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Department of
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Executive Director

DIVISION OF WATER QUALITY
Erica Brown Gaddis, PhD
Director

ATTACHMENT 2

Date Received: December 1, 2020
Date to be presented to the WQB: March 24, 2021

WATER QUALITY BOARD
FEASIBILTY REPORT FOR WASTEWATER TREATMENT PROJECT
AUTHORIZATION

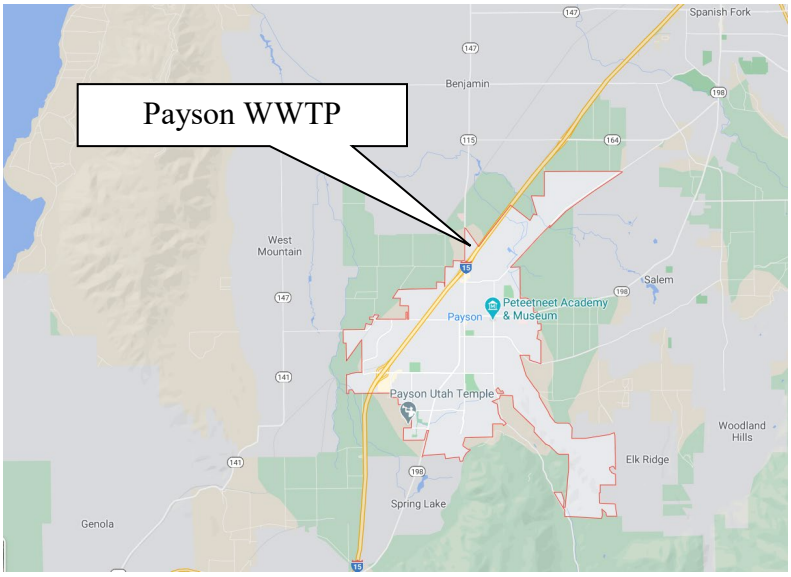
APPLICANT:	Payson City 439 West Utah Ave Payson, Utah 84651 Telephone: 801-465-5200
PRESIDING OFFICIAL	Mayor Bill Wright 439 West Utah Ave Payson, Utah 84651 Telephone: 801-465-5200
CONTACT:	Dave Tuckett, City Manager 439 West Utah Ave Payson, Utah 84651 Telephone: 801-465-5200
TREASURER:	Kim Holindrake
CONSULTING ENGINEER:	Jason Broome, Senior Project Manager Forsgren Engineering 370 East 500 South, Ste. 200 Salt Lake City, Utah 84111 801-364-4785
BOND COUNSEL:	Gilmore & Bell 15 West South Temple, #1450 Salt Lake, Utah 84101 801-258-2722
FINANCIAL ADVISOR	Brain Baker, Financial Advisor Zion Bank Public Finance, Suite 309 Provo, Utah 84601 801-369-4093

APPLICANT'S REQUEST

Payson City is requesting funding assistance from the Water Quality Board (Board) in the amount of **$23,000,000**. After the discussions that took place during the Board Finance Committee meeting, it was determined that based on availability of funds the Board would be more comfortable with funding approximately half of the project or **$11,500,000.** Payson would prefer receiving the entire funding from the Board but they appreciate any assistance through a low interest loan that they can receive from the Board to help fund the project, and are amenable to the funding of half of the project. Payson City is open to a draw schedule in which $2 million is withdrawn by Payson in FY 2023, and the remaining $9.5 million in FY 2024. This loan will finance the significant upgrade of their water reclamation facility to bring it into compliance with the Technology Based Phosphorus Effluent Limitation (TBPEL) that was placed into rule and went into effect in 2020. They are currently operating under a due diligence variance that was authorized to give them time to complete the necessary upgrades.

APPLICANT'S LOCATION

Payson City is located in Utah County, approximately 60 miles south of Salt Lake City.



PROJECT BACKGROUND

The City of Payson first installed their water reclamation facility in the 1930's. There have been several upgrades to the facility. The most recent completed expansion included headworks, aeration tanks and aeration basins, a primary digester rehabilitation, a final clarifier, and solids handling building. The facility's design capacity has an average daily flow of 3.0 million gallons per day (mgd), with a peak hydraulic capacity of 5.75 mgd. Currently, the effluent from the wastewater facility is discharging to an irrigation ditch through a 24 inch pipe. It flows into Beer Creek, which flows into Benjamin Slough, then enters Utah Lake.

PROJECT NEED

The existing wastewater treatment plant will not meet the TBPEL 1 mg/L total phosphorus requirement without the proposed upgrades. A variance granted to Payson City by the Division of Water Quality (DWQ) allows the WWTP additional time for construction. During this time, Payson City will upgrade its WWTP to meet the TBPEL. In addition, Payson is trying to plan with the upgrade for potential future Utah Lake regulatory requirements for nutrients. The proposed nutrient removal upgrade project will modify the existing facility for biological phosphorus removal and expand the daily average flow design capacity to 5 mgd. With the expanded 5 mgd capacity, the WWTP will reach capacity in 2058.

ALTERNATIVES EVALUATED

The 2019 Facilities Plan evaluated the following alternatives:

- Alternative 5.1: No Action
- Alternative 5.2: 5 mgd expansion with redundancy - chemical nutrient removal
- Alternative 5.3: 5 mgd expansion with advanced biological nutrient removal (ABNR)
- Alternative 5.4: 5 mgd expansion with ABNR, aerobic stabilization
- Alternative 5.5: 5 mgd expansion with aerobic stabilization
- Alternative 5.6: 3 mgd expansion with redundancy
- Alternative 5.7: 3 mgd expansion with ABNR system
- Alternative 5.8: 3 mgd expansion with ABNR, aerobic stabilization
- Alternative 5.9: 3 mgd expansion with aerobic stabilization (preferred alternative).
- Alternative 5.10: Additional BOD treatment for Payson fruit growers
- Alternative 5.11: 5 mgd expansion with oxidation ditch and biological nutrient removal

The proposed alternative is Alterative 5.11 which is to construct a 5 mgd expansion with a new oxidation ditch with biological nutrient removal (BNR).

PROJECT DESCRIPTION

Payson City proposes to construct a 5 mgd oxidation ditch as a treatment facility upgrade. The proposed project includes: site work, plant repairs, headworks improvements and expansion, new primary lift station, new anaerobic tank, new oxidation ditch tank, new final clarifier, solids handling facilities improvements, new chemical storage and feed building, convert chlorine contact tank to UV disinfection facility, remodel reuse pump station, upgrade filter building (convert to cloth media), convert anaerobic digesters to aerobic solids holding tanks, and modify/expand/upgrade electrical and instrumentation systems.

POSITION ON PROJECT PRIORITY LIST

This project is currently ranked No. 2 of 9 on the Project Priority List.

POPULATION GROWTH

Based on the 2010 US Census data, the 2015 population was estimated at 23,257 including 20,140 for Payson and 3,117 for Elk Ridge by the Governor's Office of Planning and Budget Demographic and Economic Analysis Section. According to the State's projections, the City of Payson has a growth rate of 2.2 % and Elk Ridge has a growth rate of 4.6 % until 2020, and then drops to 1.7 % and 1.9%, respectively, from 2020 to 2040. The combined build out population is estimated to be 44,301 people.

Year	Payson	Elk Ridge	Total
2020	22,832	3,898	26,730
2040	31,798	5,635	37,433
2050	37,526	6,776	44,301

PUBLIC PARTICIPATION AND DEMONSTRATION OF PUBLIC SUPPORT

Payson has held two public hearings regarding the proposed alternatives for the facility upgrades, and the allocation of $2 million of the municipal budget toward the engineering design of the facility upgrades. The first public hearing was on June 6th, 2019 to explain the various upgrade alternatives and accepted questions from the City Council and the public. The second public hearing was held on August 5th, 2020 to receive public input regarding the allocation of $2 million towards the engineering design.

EFFORTS TO SECURE FINANCING FROM OTHER SOURCES

Payson is seeking other sources of funding for their treatment system upgrade project at the best possible rate and term to minimize the financial burden on its citizens. Payson researched financing options from several market rate organizations including: market revenue bonds from Zions Public Finance, USDA Rural Development, the Permanent Community Impact Board, and local financial institutions.

Payson is seeking a total loan of $23,000,000, half of which the Board has indicated possible support. Payson is working with Zion's Bank to secure a loan on the private market for the remaining $11.5 million dollars. Payson hopes to secure a low interest rate, although MBIS interest rates have risen recently. Current market rates index as of March 1, 2021 are:

US 20-year Treasury Bond	2.11%
Bond Buyer Municipal Revenue Bond Index (RevDex)	1.755%

Staff analyzed various financial scenarios to try to quantify the risk associated with various loan terms for when the project is considered.

IMPLEMENTATION SCHEDULE

Payson expects to complete the project in 2025. Payson anticipates the approximate schedule:

Apply to WQB for Funding:	January 2021
WQB Funding Authorization:	March 2021
Submit Information for Facility Plan including Environmental Assessment:	June 2021
Submit Information for Engineering Report Approval:	June 2021
Commence Design:	September 2021
Advertise for Bids:	November 2021
Loan Closing:	January 2022
Commence Construction:	February 2022
Complete Construction:	January 2025

APPLICANT'S CURRENT USER CHARGE

Currently, Payson charges approximately $35.58 per month per ERC. According to the Utah Water Quality Board's criteria of 1.4% of MAGI ($46,000 for Payson), a rate of $53.67 per month for wastewater service should be exceeded for grant consideration as part of a funding package. The impact fee is $1,823 and the hookup fee is $170.

COST ESTIMATE

The total cost of the project is estimated to be $24,000,000. A breakdown of these costs follows.

Land/Right-of-way	$60,000
Legal/Bonding	$140,000
DWQ Loan Origination Fee	$230,000
Engineering - Design	$900,000
Engineering - CMS	$900,000
Construction	$18,000,000
Contingency (18%)	$3,770,000
Total Project Cost:	**$24,000,000**

COST SHARING

The total cost of the project is $24,000,000.

Funding Source	Cost Sharing	Percent of Project
Local Contribution	$1,000,000	4.2%
Other Funding Sources	$11,500,000	47.9%
WQB Funding	$11,500,000	47.9%
Total Amount:	$24,000,000	100%

ESTIMATED ANNUAL COST FOR SEWER SERVICE

Different funding options result in different annual sewer costs. The cost model shown in Attachment 1 analyzes possible funding options. The resulting total annual sewer cost is shown for each funding Alternative. Staff did not include impact fees toward loan repayment in the cost model.

STAFF COMMENTS

Although Payson City is requesting $23,000,000 in financial assistance from the Board, staff has determined that to continue to support other important water quality projects in the State and maintain positive fund balances through the critical FY23 construction period, the board is not able to fully fund this project. A Finance Committee Meeting was held on February 19, 2021 to discuss a feasible deal for Payson, as well as other funding requests. During that meeting, the Board indicated that staff should consider funding 50% of Payson's original request. Staff anticipates draws to the fund to occur as follows: $2 million in FY 2023 and $9.5 million in FY 2024. In a following meeting with DWQ Staff, Payson City officials said they were supportive and appreciative of the Board's position. Staff recommends the Board consider a loan interest rate based on the following factors. The 20 year market loan rate is 2.11% based on the US Treasury Daily Yield Curve and 1.755% based on the MBIS. In this case the US Treasury rate was used for recommendation of an interest rate.

Market Rate (20 year basis)	2.11%	
Discount Factors:	Maximum Discount	Recommended Discount
Economic Hardship	2.11%	0%
SRF Programmatic Costs	1.0%	0.60%
Fiscal Sustainability Credit	0.5%	0.25%
Green Project Reserve	0.5%	--
Regionalization	0.25%	0.15
Recommended Interest Rate		**1.11%**

This project will allow Payson to maintain compliance with the TBPEL requirements, and decrease the nutrient loading to Utah Lake. Specifically, the upgrades will make it possible for the plant to reduce the phosphorus that is discharged from the treatment facility and bring them into compliance with the TBPEL of 1.0 mg/l.

STAFF RECOMMENDATION

Staff recommends that the Board authorize: a loan to Payson City of $11,500,000 at an interest rate of 1.11 % repayable over 20 years. The loan will be subject to the following conditions:

1. Payson must agree to participate annually in the Municipal Wastewater Planning Program (MWPP).
2. Payson must pursue and retain remaining funding necessary to fully implement the project.
3. Payson must develop and implement an asset management program that is consistent with EPA's Fiscal Sustainability Plan guidance.

Attachment 1
March 24, 2021
Water Quality Board
Payson City - Feasibility Report Authorization

Attachment 1
Payson City - Water Quality Board
20 Year Loan Static Cost Model

Project Costs

Land/Right-of-way	$	60,000	
Legal/Bonding	$	140,000	
DWQ Loan Origination Fee	$	230,000	1% of DWQ only
Engineering - Design	$	900,000	
Engineering - CMS	$	900,000	
Construction	$	18,000,000	
Contingency	$	3,770,000	
Total Project Cost:	**$**	**24,000,000**	

Project Funding

Local Contribution	$	1,000,000	No CIB funding
Loan	**$**	**23,000,000**	
WQB Grant	**$**	**-**	
Total Project Cost:	**$**	**24,000,000**	

Current Customer Base & User Charges

Initial Total Customer (ERU	7,500
MAGI for Payson City (20	$46,000
Affordable Monthly Rate a	$53.67
Impact Fee (per ERU):	$1,823
Current Monthly Fee (per E	$35.00
Existing Sewer Debt Servic	$580,000
Annual O&M expensive	$1,629,000

Funding Conditions

Loan Repayment Term:	20
Reserve Funding Period:	6

ESTIMATED COST OF SEWER SERVICE- 20 Year

WQB Loan	WQB Loan Interest Rate	New WQB Debt Service	WQB Loan Reserve	Market Loan Interest	Market Loan Amount	New Market Loan Debt Service	1.25 DSCR Set Aside	Annual Sewer O&M Cost	Existing Debt Service	Total Annual Sewer Cost	Monthly Sewer Cost/ ERU	Sewer Cost as % of MAGI
11,500,000	2.11%	177,698	710,790	1.76%	11,500,000	686,784	171,696	1,629,000	580,000	3,955,968	43.96	1.15%
11,500,000	1.86%	173,459	693,836	1.76%	11,500,000	686,784	171,696	1,629,000	580,000	3,934,775	43.72	1.14%
11,500,000	1.61%	169,278	677,112	1.76%	11,500,000	686,784	171,696	1,629,000	580,000	3,913,869	43.49	1.13%
11,500,000	1.36%	165,155	660,618	1.76%	11,500,000	686,784	171,696	1,629,000	580,000	3,893,252	43.26	1.13%
11,500,000	**1.11%**	**161,089**	**644,357**	**1.76%**	**11,500,000**	**686,784**	**171,696**	**1,629,000**	**580,000**	**3,872,926**	**43.03**	**1.12%**
11,500,000	0.86%	157,082	628,330	1.76%	11,500,000	686,784	171,696	1,629,000	580,000	3,852,892	42.81	1.12%
11,500,000	0.50%	151,416	605,664	1.76%	11,500,000	686,784	171,696	1,629,000	580,000	3,824,560	42.50	1.11%
11,500,000	0.25%	147,553	590,213	1.76%	11,500,000	686,784	171,696	1,629,000	580,000	3,805,246	42.28	1.10%
11,500,000	0.00%	143,750	575,000	1.76%	11,500,000	686,784	171,696	1,629,000	580,000	3,786,230	42.07	1.10%

State of Utah

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DIVISION OF WATER QUALITY
Erica Brown Gaddis, PhD
Director

M E M O R A N D U M

TO: Water Quality Board

THROUGH: Erica Gaddis, PhD
Director, Division of Water Quality

THROUGH: Dan Hall, P.G.
Individual Permitting Section Manager

FROM: Sarah Ward
Environmental Scientist III

DATE: January 26, 2022

SUBJECT: Request for Aquifer Classification Petition Approval for the Bryce Canyon Area, Garfield County, Utah

At its April 27, 2021 meeting, the Water Quality Board authorized Division staff to proceed with Ground Water Classification for the Bryce Canyon Area in Garfield County, Utah, based on the petition of the Garfield County Commission. A public hearing was held at Ruby's Inn in Bryce Canyon, Utah on August 3, 2021. Comments were received at the public hearing and for 45-day public comment period. The public comment period began on July 8, 2021 and ended on August 23, 2021. The majority of the comments were concerning septic density, water quantity, and the establishment of local rules to protect the aquifer. A summary of the public comments and the Division responses is provided in the packet.

Attached is a copy of the petition request from Garfield County Commission. The petition was prepared for Garfield County Commission by Janae Wallace and Trevor Schlossnagle of the Utah Geological Survey. Technical review on the draft aquifer classification report and maps were provided by staff of the Division of Water Quality Individual Permits Section.

Based on ground water usage the classification of 1A under R317-6-4(4.2) is appropriate, establishing the "[c]lass 1A ground water will be protected to the maximum extent feasible from degradation due to facilities that discharge or would probably discharge to ground water." A copy

of R317-6-4 "Ground Water Class Protection Levels" and the applicable portion of R317-6-5, "Ground Water Classification for Aquifers", are included for reference. Figure 1 from the petition shows the location and boundaries of the aquifer for which classification is requested.

Aquifer petition rules allows the Board to classify entire aquifers or parts of aquifers according to the quality or use of the ground water contained therein. Boundaries for the class areas are to be delineated and based on hydrogeologic properties and existing ground water quality or usage. Parts of the same aquifer may be classified differently. When considering an aquifer classification petition, the Board should be aware of the following applications and limitations.

Aquifer Classification is:

1. In the absence of other more site-specific data, a predetermined basis for establishing protection levels and best available control technology in the issuance of ground water discharge permits by the Division of Water Quality.

2. A common ground water quality management objective to be maintained when used as a land use management tool by local agencies.

3. A consolidation of knowledge about a given hydrologic setting from a number of scientific and technical sources.

4. A formal administrative prioritization of the ground water resource.

Aquifer Classification is NOT:

1. A mandatory requirement to take specific action on the part of local government including application of any land use zoning restrictions.

2. An obligation by local government to perform technical assessments, monitoring or ongoing financial investments.

3. An assumption of the state responsibility to enforce or enact county or local ordinances on waste management practices.

Based on a review of the petition and supporting information, staff has determined that the aquifer classification has met the criteria stipulated in UAC R317-6-5 and is in the best interest of the beneficial users. Therefore, staff recommends that the Board approve the classification as designated in the petition.

R317-6-4. Ground Water Class Protection Levels.

4.1 GENERAL

A. Protection levels are ground water pollutant concentration limits, set by ground water class, for the operation of facilities that discharge or would probably discharge to ground water.

B. For the physical characteristics (color, corrosivity, odor, and pH) and radionuclides listed in Table 1, the values listed are the protection levels for all ground water classes.

4.2 CLASS IA PROTECTION LEVELS

A. Class IA ground water will be protected to the maximum extent feasible from degradation due to facilities that discharge or would probably discharge to ground water.

B. The following protection levels will apply:

1. Total dissolved solids may not exceed the greater of 1.25 times the background or background plus two standard deviations.
2. When a contaminant is not present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 0.1 times the ground water quality standard value, or the limit of detection.
3. When a contaminant is present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 1.25 times the background concentration, 0.25 times the ground water quality standard, or background plus two standard deviations; however, in no case will the concentration of a pollutant be allowed to exceed the ground water quality standard.

4.3 CLASS IB PROTECTION LEVELS

A. Class IB ground water will be protected as an irreplaceable source of drinking water.

B. The following protection levels will apply:

1. Total dissolved solids may not exceed the lesser of 1.1 times the background value or 2000mg/l.
2. When a contaminant is not present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 0.1 times the ground water quality standard, or the limit of detection.
3. When a contaminant is present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 1.1 times the background concentration or 0.1 times the ground water quality standard; however, in no case will the concentration of a pollutant be allowed to exceed the ground water quality standard.

4.4 CLASS IC PROTECTION LEVELS

Class IC ground water will be protected as a source of water for potentially affected wildlife habitat. Limits on increases of total dissolved solids and organic and inorganic chemical compounds will be determined in order to meet applicable surface water standards.

4.5 CLASS II PROTECTION LEVELS

A. Class II ground water will be protected for use as drinking water or other similar beneficial use with conventional treatment prior to use.

B. The following protection levels will apply:

1. Total dissolved solids may not exceed the greater of 1.25 times the background value or background plus two standard deviations.

2. When a contaminant is not present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 0.25 times the ground water quality standard, or the limit of detection.
3. When a contaminant is present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 1.25 times the background concentration, 0.25 times the ground water quality standard, or background plus two standard deviations; however, in no case will the concentration of a pollutant be allowed to exceed the ground water quality standard.

4.6 CLASS III PROTECTION LEVELS

A. Class III ground water will be protected as a potential source of drinking water, after substantial treatment, and as a source of water for industry and agriculture.
B. The following protection levels will apply:
   1. Total dissolved solids may not exceed the greater of 1.25 times the background concentration level or background plus two standard deviations.
   2. When a contaminant is not present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 0.5 times the ground water quality standard, or the limit of detection.
   3. When a contaminant is present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 1.5 times the background concentration or 0.5 times the ground water quality standard or background plus two standard deviations; however, in no case will the concentration of a pollutant be allowed to exceed the ground water quality standard. If the background concentration exceeds the ground water quality standard no increase will be allowed.

4.7 CLASS IV PROTECTION LEVELS

Protection levels for Class IV ground water will be established to protect human health and the environment.

R317-6-5. Ground Water Classification for Aquifers.

5.1 GENERAL

A. When sufficient information is available, entire aquifers or parts thereof may be classified by the Board according to the quality of ground water contained therein and commensurate protection levels will be applied.
B. Ground water sources furnishing water to community drinking water systems with ground water meeting Class IA criteria are classified as Class IA.

5.2 CLASSIFICATION AND RECLASSIFICATION PROCEDURE

A. The Board may initiate classification or reclassification.
B. A petition for classification or reclassification must be performed under the direction, and bear the seal, of a professional engineer or professional geologist.
C. Boundaries for class areas will be delineated so as to enclose distinct ground water classes as nearly as known facts permit. Boundaries will be based on hydrogeologic properties, existing ground water quality and for Class IB and IC, current use. Parts of an aquifer may be classified differently.

D. The petitioner requesting reclassification will provide sufficient information to determine if reclassification is in the best interest of the beneficial users.
E. A petition for classification or reclassification shall include:
    1. factual data supporting the proposed classification;
    2. a description of the proposed ground waters to be classified or reclassified;
    3. potential contamination sources;
    4. ground water flow direction;
    5. current beneficial uses of the ground water; and
    6. location of all water wells in the area to be classified or reclassified.
F. One or more public hearings will be held to receive comment on classification and reclassification proposals.
G. The Board will determine the disposition of all petitions for classification and reclassification, except as provided in R317-6-5.2.H.
H. Ground water proximate to a facility for which an application for a ground water discharge permit has been made may be classified by the Director for purposes of making permitting decisions.

Bryce Canyon Area, Garfield County, Utah Aquifer Classification
Public Comments Responsiveness Summary

Comment Number	Public Commenter First Name	Public Commenter Last Name	Comment Date	Public Comment Document No.	Public Comment to Respond to (UDWQ sometimes splits the original public comments to make sure each comment within a larger comment submission is addressed).	DWQ's Response
1.01	Travis	Holm	3-Aug-21	Public Hearing	I wanted to talk to Sarah. We had two north water system is grill for water wells by the Pine Hills and we have Emery Valley looking at doing a septic discharge over the area next to our well. I had to talked to Ken Hoffman about this and he has stated these wells are thousand feet away from the pivot system that is going to be dispersing septic water onto the ground. I think that was misstated. The accuracy of the wells is not right, what you guys have received. I need to make sure you got the exact location of the wells in relation to the pivot system. That is all I came here to say!	This comment was regarding another DWQ project and will not be addressed in this response public comment document.
2.01	Kaden	Figgins	3-Aug-21	Public Hearing	Kaden Figgins: Garfield County Planner; I think a lot of people here and even from the Garfield County perspective, our question is what happens after this meeting, are we, I know we're not making any decisions today it's my hope. That both DEQ, Garfield County and developers have important clear understanding of how to proceed. Do we do we move forward with drinking water classification doing or pristine and I know the questions asked earlier.	The next step after public comment is to respond to comment and then submit to the Water Quality Board for approval. Also, ground water classifications are intended to be used as a planning tool by local governmental agencies. Ground water classifications do not mandate any specific actions for local planning and zoning, nor obligate local government to perform any technical assessments or monitoring, nor restrict existing or future land use. In accordance with R317-6-5, the Aquifer Classification is: 1. In the absence of other more site-specific data, a predetermined basis for establishing protection levels and best available control technology in the issuance of ground water discharge permits by the Division of Water Quality. 2. A common ground water quality management objective to be maintained when used as a land use management tool by local agencies. 3. A consolidation of knowledge about a given hydrologic setting from a number of scientific and technical sources. 4. A formal administrative prioritization of the ground water resource. The Aquifer Classification is NOT: 1. A mandatory requirement to take specific action on the part of local government including application of any land use zoning restrictions. 2. An obligation by local government to perform technical assessments, monitoring or ongoing financial investments. 3. An assumption of the state responsibility to enforce or enact county or local ordinances on waste management practices. Lastly, there is no regulatory relationship between a formal aquifer classification under R317-5(5.1)(A thru G) and groundwater permitting since R317-6-5(5.1)(H) already allows for a site specific classification to be made by the Director for purposes of making permitting decisions: "H. Ground water proximate to a facility for which an application for a ground water discharge permit has been made may be classified by the Director for purposes of making permitting decisions."
2.02					If we move forward one way or the other, what does that do to wastewater standard	Please see response 2.01.
2.03					What does that do to development and from my question	Please see response 2.01.
2.04					What should the county be doing	Please see response 2.01.

Comment Number	Public Commenter First Name	Public Commenter Last Name	Comment Date	Public Comment Document No.	Public Comment to Respond to (UDWQ sometimes splits the original public comments to make sure each comment within a larger comment submission is addressed).	Action
2.05					I know this is a local planning tool and it doesn't necessarily mean we adopt ordinances, but it could. There is a septic tank thing density studies and different kind of plan use techniques, and so I think like I said for the public, I think that's what we're looking for both county and the public sector.	Ordinances may be adopted by the county and this classification is meant to provide a basis for doing so.
3.01	Marty	Rich	3-Aug-21	Public Hearing	Marty Rich: Representing Bryce Lodge. One of my considers is how safe are these sewer plants being put in. Do we really know how safe they are?	Wastewater treatment plants are able to remove more nitrogen and phosphorus from their discharges than others depending on their equipment and how they treat wastewater. Enhanced treatment systems enable some wastewater plants to produce discharges that contain less nitrogen than plants using conventional treatment methods.
3.02					With a shallow aquifer, some of it 50 feet deep and others 200 feet deep, what if the aquifer becomes contaminated, what happens to the rest of us.	Engineering, Construction and Design plans are reviewed, permitted and inspected by the Division of Water Quality to ensure facilities meet requirements. In accordance to R317-6-6.15, Corrective Action may be taken if a problem does arise.
3.03					We have the best water in the world, I hate to see something happen drastic to it. This one of my main concerns.	The aquifer classification is meant to assist the county in planning and determining how the resource is protected based on local needs. See also response 2.01 above.
4.01	Pio	Lombaro	3-Aug-21	Public Hearing	Pio Lombaro: When will the designation become official. As this would affect the Emery permitted under consideration by UDEQ.	The classification will be affective after the Water Quality Board approves it. This classification will not affect projects as described by the comment; see response 2.01.
4.02					Also, in the water quality studies performed were mass balances done to determined the sources of TDS and in particular nitrate - nitrogen levels in groundwater. Thank you.	In the aquifer classification document, "Petition for Groundwater Quality Classification, Bryce Canyon Area, Garfield County, Utah," under "Potential Contaminant Sources" list the potential sources. Mass balance calculations for pollutant loadings were not made and are not required for a classification- see R317-6-5. A pollutant loading analysis is being made by the UGS for a septic tank density study (nitrate) and is separate from this classification proposal.
5.01	Ron	Harris	3-Aug-21	Public Hearing	Ron Harris: Two questions, how will this designation affect the current sewer systems that are in place right now to being operated?	The Aquifer Classification is a planning tool for Garfield County. The county will make the decisions regarding a sewer district.
5.02					Is this going to be a tool that we use to force a district sewer system that everyone will have to be members of and buy into or however that will work is that going to be a stepping block for that to happen to our area.	No. Please see response 2.01.
6.01	Scout	Holm	3-Aug-21	Public Hearing	Scout Holm: I also own property of on the plateau within the aquifer. I guess the main question, I would have were one I would like to make is about is after the one a classification takes place, I know the septic treatment will be you know, probably the biggest item on everyone's minds tonight. How that will work.	Please see response 2.01.
6.02					I would like to see or suggested that the county, who is making this petition, the state DEQ and then establish health department, how that will all work together on the same page as far as the septic treatment goes.	DWQ, Garfield county and the Southwest Health department have been and continue to be in in communication and coordination on issues related to development in the Bryce Canyon area. Please see response 2.01.

Comment Number	Public Commenter First Name	Public Commenter Last Name	Comment Date	Public Comment Document No.	Public Comment to Respond to (UDWQ sometimes splits the original public comments to make sure each comment within a larger comment submission is addressed).	DWQ's Response
6.03					Currently, I understand, as far as the nitrate goes one standard that the state is told my development or my business is that we have to treat septic down to a certain amount and we're good with that. You know, looking down the road along a long way out the worst thing that could happen is if we contaminate this aquifer. I think we all agree with the presentation water is very clean and so, in the long term, we would like to maintain a clean water source, especially treating the septic. And then, but, most recently, while this is going on and we've been forced or not forced been asked to design the systems to treat the septage to a very clean standard the Southwest Health Department has issued permits fit are significantly more basic that don't treat the water down to the standard. And so between the county, the state and the Southwest Health department seemed like this standards is same. One other thing I would like to suggest is that the county, who is making this petition, they have an ordinance in next place called watercress. I think it checks the box is that each developer will have to go through in order to build over a pristine. I would just ask that the ordinance include the whole aquifer. I think currently there are so many takes in a small portion of the aquifer, but I would ask or suggest that it takes in the whole aquifer, no imaginary line so. That's how I say thank you.	Please see response 2.01.
7.01	Kaden	Figgens	3-Aug-21	Public Hearing	Kaden Figgins: So obviously and the county level, we have a lot of developers and even just concerned citizens coming to us and the question that I receive more often than not, is who is the one doing, I think we are the petitioner correct.	Garfield county is the petitioner and the Board is the approving body.
8.01	Scout	Holm	3-Aug-21	Public Hearing	Scout Holm: Thanks for your question Kaden and that was a good one, I did have one suggestion. When we first, me and my group, we're trying to develop here. We have a system that has been designed. When the conversation first got brought up the aquifer was going to be classified pristine, there was some recommendations put in place to where the septic had treated down in a certain point to be safe and that was 2.5 milligrams per liter of nitrogen, and so I just asked it in this mean, in the meantime obviously being classified that everyone have to meet that standard. To be saved, to protect the aquifer. And then I would just want to say that I would you know if there's any shadow of a doubt it is, the aquifer needs to be pristine I would say for myself that it should classify this as a 1A. Thank you.	The Division of Water Quality, Garfield County and Southwest Health Department have a working relationship.
9.01	John	Jacobs	23-Aug-21	DWQ-2021-016875	Garfield County should allow mixing with groundwater in the aquifer to be considered when regulating a wastewater discharge.	Please see response 2.01. While this study does not take this into consideration a septic tank density study attempts to do so. Also, see response 4.02.
9.02					Classification of the aquifer as Pristine appears to be premature because it is based on analysis of samples for Total Dissolved Solids (TDS) and Nitrate, but there may be other unanalyzed contaminants that may be present at concentrations in excess of Utah Groundwater Quality Standards	In accordance to R317-6-5, Ground Water Classification for Aquifers, DWQ has received sufficient information in the petition to classify the aquifer for the Bryce Canyon Area, Garfield County, Utah. Also, R317-6-5(5.2)(B) allows for reclassification if necessary. However, given the existing information the water quality in the area is very consistent across the area and all data collected are consistent with other studies in the area.
10.01	David	Ure	23-Aug-21	DWQ-2021-017226	The State of Utah School and Institutional Trust Lands Administration (SITLA) is an independent agency that manages lands in Utah to generate revenues for its beneficiaries, which are primarily Utah's K-12 schools. The SITLA managed lands include more than 154,000 acres in Garfield County. SITLA is a substantial landowner in the Bryce Canyon Area (study area), owning approximately 39,000 acres or some 35% of the lands contained in the study area. SITLA appreciates the opportunity to comment on Garfield County Commission's petition to classify the groundwater aquifer in the Bryce Canyon Area as Class 1A, Pristine Ground Water. SITLA is concerned that there is not enough information available to make the classification, in particular concerning future potential contaminant sources.	Please see responses 2.01 and 9.02.

Comment Number	Public Commenter First Name	Public Commenter Last Name	Comment Date	Public Comment Document No.	Public Comment to Respond to (UDWQ sometimes splits the original public comments to make sure each comment within a larger comment submission is addressed).	DWQ's Response
10.02					Additionally, such a classification could negatively impact SITLA's ability to develop its lands, which would impair SITLA's ability to accomplish its constitutional mandate of generating revenues from future real estate development of SITLA property in the Bryce Canyon Area.	Please see response 2.01.
10.03					Therefore, SITLA requests 1) the Utah Division of Water Quality (DWQ) to recommend denial of the petition to the Utah Water Quality Board (Board)	Please see response 9.02.
10.04					2) the Board to deny Garfield County Commission's petition to classify the Ground Water in the Bryce Canyon Area, Garfield County, Utah as Class 1A, Pristine Ground Water.	Please see response 9.02.
10.05					We recommend that the DWQ and the Board encourage Garfield County to improve the functionality of the Bristlecone Special Service District (SSD) in the Bryce Canyon Area so that the SSD can support the growth and real estate development plans for all landowners in the Bryce Canyon Area and include Bryce Canyon City in its service area while maintaining the Bryce Canyon Area groundwater aquifer as in clean a condition as technologically possible. Thank you for the opportunity to submit this comment. Please contact us if you have any questions or need clarification.	Please see response 8.01.
11.01	Gayle	Pollock	3-Aug-21	DWQ-2021-023922	To the Garfield County Commission: Since the carefully scripted public meeting on water quality and aquifer designation did not provide for any opportunity on the real questions that those attending wanted to ask, I have drafted a summary of questions and observations related to the water quality study for the Emery Valley conducted by the Utah Geological Survey that I hope to have addressed. General Comments on establishing a water budget for current and future development of the Emery Valley and John's Valley area of Garfield County in reference to the ongoing study of the water resources by the Utah Geological Survey: The basic definition of a water budget is that it is a foundational tool used to compile water inflows (supplies) and outflows (demands). It is an accounting of the total groundwater and surface water entering and leaving a basin or user defined area. A water budget considers the storage and movement of water in the hydrologic cycle. It has been said: "you can't manage what you don't measure". My concerns and shared by others are that a limited study is not enough to fully understand or develop a planning tool like a water budget that can guide prudent, responsible decision making in terms of current and future development for the Emery Valley and John's Valley area.	The water budget is being evaluated by UGS. The public hearing was for the classification for the Bryce Canyon Aquifer.
11.02					Questions Here are several questions and observations that should be addressed and answered from the research: -From the study, is precipitation the largest contributor to valley-fill aquifer recharge or is infiltration from surface water sources the largest contributor? If precipitation is the largest contributor, how will mega-droughts (like the one we are currently experiencing) and climate change patterns be factored into the water budget used to guide current and future demands on both surface and groundwater water resources?	In this area, since it is the origination- i.e. headwaters- of the East Fork of the Sevier River, all recharge is from precipitation. Droughts will affect the amount of available recharge to dilute any contaminants from sources in the area. Please see response 11.01.

Comment Number	Public Commenter First Name	Public Commenter Last Name	Comment Date	Public Comment Document No.	Public Comment to Respond to (UDWQ sometimes splits the original public comments to make sure each comment within a larger comment submission is addressed).	DWQ's Response
11.03					Did evaluation of any available historic data (even anecdotal information) on surface and groundwater increases or decreases contribute to the initial report findings?	This study and classification are not about water availability, budgets and historic fluctuations of the water table. Please see response 2.01.
11.04					What are the average well depths in the valley-fill aquifer? Are there any wells in the Emery Valley hydrologic basin that produce water from upper Cretaceous formations? If so, what are the average well depths? The reason why I pose this question is that if future development includes tapping into the deeper, upper Cretaceous bedrock aquifer (5,000 - 9,000 B.P.) which the town of Tropic relies upon for culinary water, are there potential impacts?	The depth of the alluvial fill in the area ranges from a few 10's of feet to at most 200 feet in thickness. The alluvium is the only source used for culinary purposes in the area. Please see "Geologic Setting" and "Groundwater Conditions" of the petition beginning on pages 6 and 10 respectively. This petition and classification do not directly address this question and more information will be provided by the UGS study on water availability and the overall budget. However, it is unlikely that use of the lower aquifer in this area would affect the aquifer in the Tropic area since it is across a major topographic and groundwater divide.
11.05					Does the structural geology of the Emery and John's Valley area, which likely is represented by late Paleogene or early Neogene compressional deformation, influence groundwater storage or hydrologic basin partitioning? There are at least two major thrusting events, the Ruby's Inn and Pine Hills, that run through the study area. What influence if any, do they have on water resources?	Please see "Geologic Setting" and "Groundwater Conditions" of the petition beginning on pages 6 and 10 respectively.
11.06					What guidelines or compliance measures would be put in place, or are in place, to prevent current and future overdraft from surface and groundwater storage? Who is responsible for monitoring?	These issues are regulated and overseen by the State Engineer and the Division of Water Rights.
11.07					I do not understand how a losing stream (East Fork Sevier River) by water resources definition, and as demonstrated by the Utah Geological Survey study - going from nearly 45 cubic feet per second of discharge (gaining stream) above the Tropic Ditch diversion to around 5 cubic feet per second at the Tom Best Spring Road (75% of flow lost to groundwater) can allow for surface water rights to be transferred from Antimony to the Emery Valley.	Please see response 11.02 and 11.09.
11.08					Furthermore, how can any current development of water resources in Emery Valley be allowed until additional studies are conducted that can guide responsible allocation and management based upon best practices and sound scientific data?	Please see response 11.02 and 11.09.
11.09					Finally, the biggest unanswered question from two years? of study is what are total estimates of current ground water reserves?	Please see response 11.02 and 11.09.

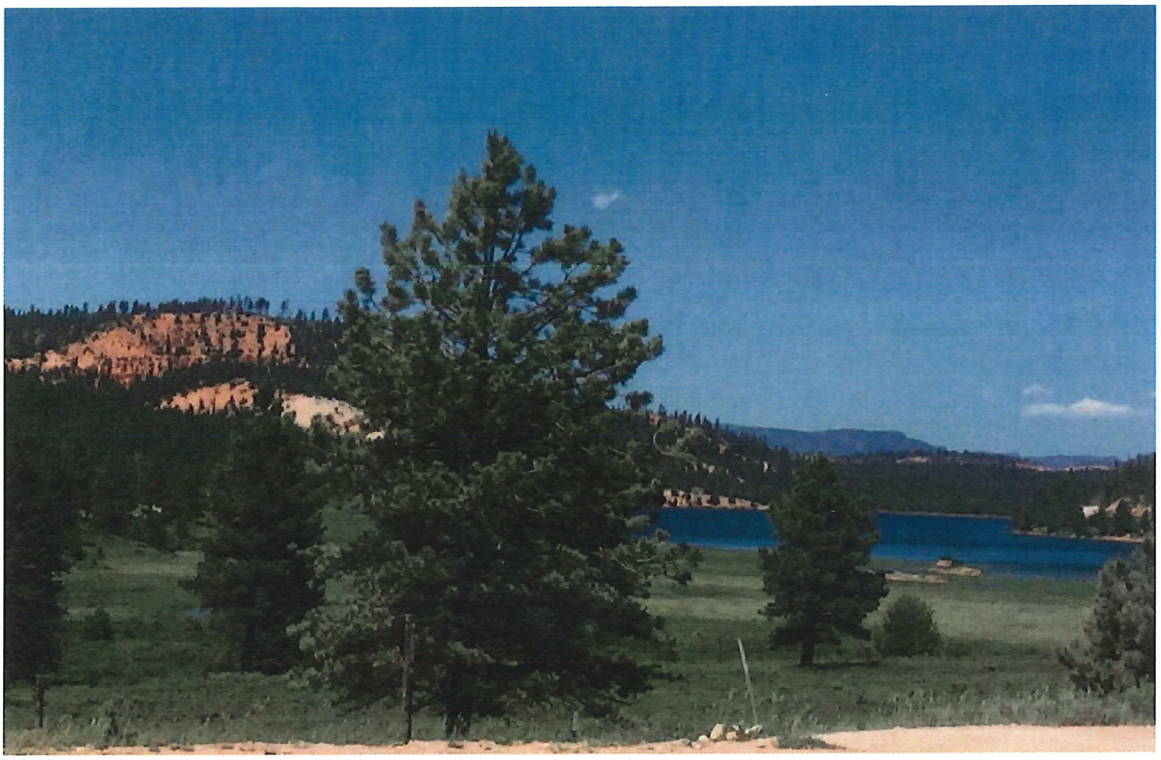
PETITION FOR GROUNDWATER QUALITY CLASSIFICATION, BRYCE CANYON AREA, GARFIELD COUNTY, UTAH

Submitted to Utah Water Quality Board by Garfield County Commission

Prepared by

Janae Wallace and Trevor Schlossnagle
Utah Geological Survey

April 14, 2021



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INTRODUCTION

This is a formal petition to the Utah Water Quality Board submitted by the Utah Geological Survey on behalf of Garfield County to classify groundwater quality in the valley-fill aquifers of Johns and Emery Valleys under "Administrative Rules for Ground Water Quality Protection R317-6, December 1, 2019," Section 317-6-5, Ground Water Classification for Aquifers, Utah Administrative Code.

Johns Valley is in eastern Garfield County, central Utah, between latitudes 37° 24′ and 38° N. and longitudes 112° 15′ and 111° 52′ W. The main focus of the petition (figure 1) is Bryce Canyon City and the gently rolling, forested slope to the northwest and north; the East Fork Sevier River below Tropic Reservoir and associated side drainages, particularly East Creek; and Johnson Bench and Emery Valley, which comprise the southwestern end of Johns Valley. Bryce Canyon City is about 20 miles southeast of the community of Panguitch. The northwest rim of Bryce Canyon itself forms the southeastern study area boundary. Emery Valley is an intermontane basin that is bounded by the Sevier Plateau on the north and east, and the Paunsaugunt Plateau on the southwest, and opens to Johns Valley to the northeast. The East Fork Sevier River flows through Emery Valley from southwest to northeast and continues northeast through Johns Valley. The hand-dug Tropic Ditch taps into the East Fork Sevier River and transports water east through Water Canyon toward Tropic Valley (Davis and Pollock, 2010). Wells serving Bryce Canyon National Park are located in shallow aquifers south of the Ruby's Inn thrust fault. This classification document helps Garfield County recognize the value of their groundwater resource and aligns with their 2019 Economic Plan of planning and preparing for future water issues (Garfield County Economic Development Plan, 2019).

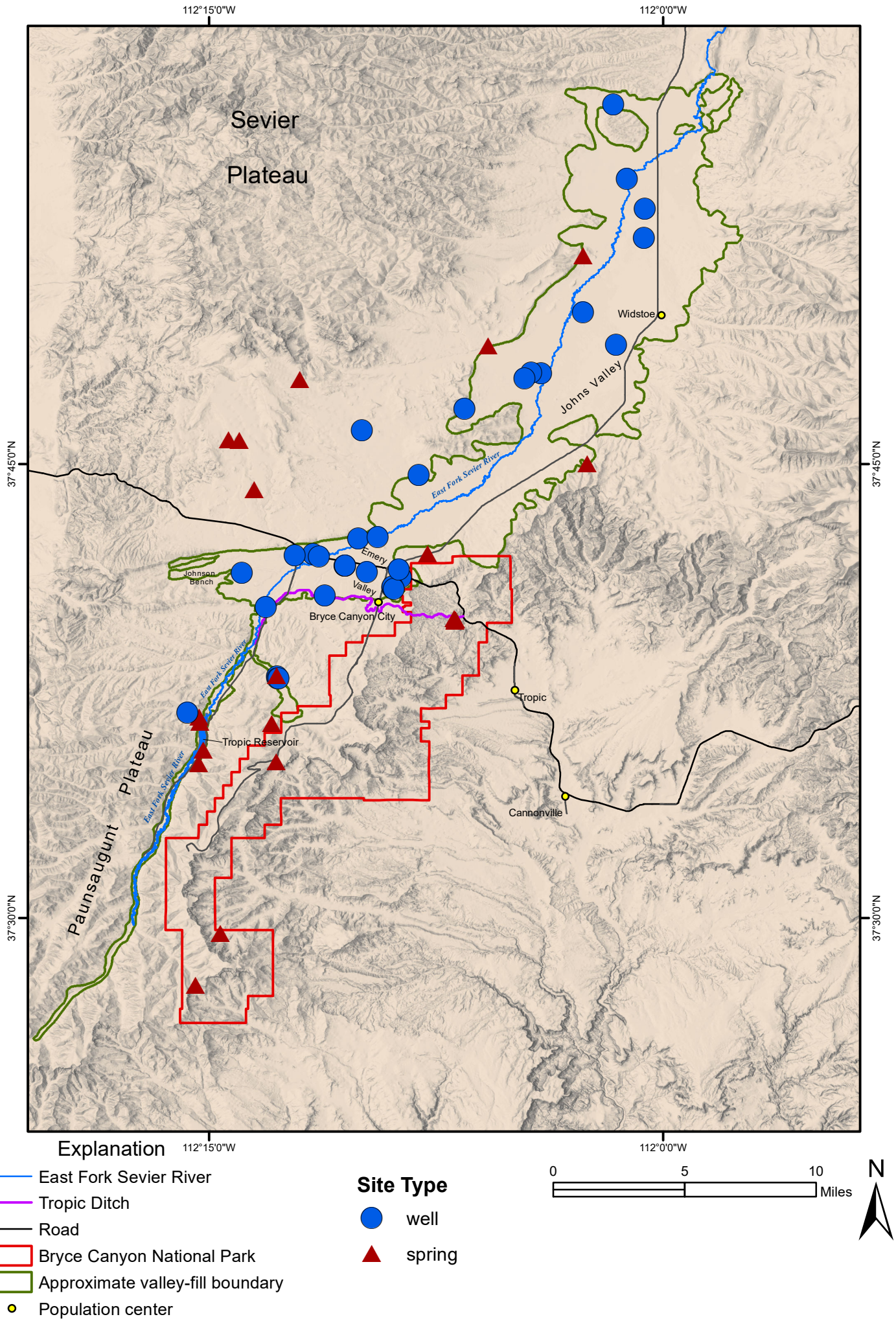

Figure 1. *Location map of Johns and Emery Valleys, Garfield County, showing sampling locations for wells and springs.*

POPULATION AND LAND USE

Garfield County had an estimated 2019 population of 5051 people, making it the least densely populated county in Utah (U.S. Census Bureau, 2019). Most of the population in Johns and Emery Valleys is concentrated in and around Bryce Canyon City. Johns and Emery Valleys also have some second homes, cabins, and resort lodging that are occupied only part of the year. Seasonal population added to the census-derived population increases the mean population. Bryce Canyon City had an estimated projected 2020 population of 232 people (Utah Governor's Office of Management and Budget, 2012). The community of Bryce Canyon City is an area of active tourism, with recreation and leisure activities centered within or near Bryce Canyon National Park (BCNP). The surrounding community of Bryce Canyon City is residential and commercial, and typically revolves around Ruby's Inn and catering to tourism. Some other land uses include irrigated crop lands, small scale animal feeding operations, gravel mining, and waste disposal.

FACTUAL DATA

Sufficient information is available to classify the valley-fill aquifer in the Bryce area. Data required to formally petition the Utah Water Quality Board were partly obtained from previously published studies (listed in the References section of this petition). Most of the information required for classification is presented on maps and in data tables submitted with this petition, including:

- Plate 1 - Groundwater quality map showing total-dissolved-solids concentrations;
- Plate 2 - Groundwater quality classification map showing groundwater quality classification, well locations, and groundwater flow direction; and
- Plate 3 - Potential-contaminant-source map.

In addition, a previously released publication containing valuable information about the upper Sevier drainage basin, which includes Johns and Emery Valleys, is provided with this petition:

- Ground-Water Hydrology of the Upper Sevier River Basin Beaver Valley Area, South-Central Utah and Simulation of Ground-Water Flow in the Valley-Fill Aquifer in Panguitch Valley (Thiros and Brothers, 1993; https://www.waterrights.utah.gov/cgi-bin/docview.exe?Folder=TP20-6-511&Title=Technical+Publication+102).

GEOLOGIC SETTING

Johns and Emery Valleys are in the Colorado Plateau physiographic province. Johns Valley, situated between the Escalante Mountains and Sevier Plateau, is a topographic depression in which valley-fill sediment has accumulated from the East Fork Sevier River and alluvial fans and side drainages emanating from the surrounding hills. Emery Valley, a southwestern extension of Johns Valley is situated between the Sevier

and Paunsaugunt plateaus. The valley fill forms the principal aquifer of both valleys. Bryce Canyon is a major geologic feature to the south of both valleys.

Geologic units in the study area are Quaternary unconsolidated deposits, Tertiary volcanic and sedimentary rocks, and Cretaceous sedimentary rocks. The predominant geologic units are Quaternary valley fill, the Tertiary Mount Dutton, Brian Head, and Claron Formations, and the Cretaceous Kaiparowits, Wahweap, and Straight Cliffs Formations.

The Quaternary unconsolidated deposits include gravel, sand, and clay derived from adjacent hills and mountains that were deposited in alluvial-fan, fluvial, and mass-movement environments.

The Oligocene-Miocene Mount Dutton Formation is moderately resistant to nonresistant volcanic mudflow breccia consisting of angular to subrounded, matrix-supported, pebble- to boulder-sized clasts of dacitic to andesitic volcanic rock in a muddy to sandy matrix (Mackin and Rowley, 1976; Maldonado and Williams, 1993a, 1993b; Rowley and others, 1994). In the northwestern part of Johns Valley in the Sevier Plateau, Mount Dutton Formation is light- to dark-gray and brown, andesitic to dacitic volcanic mudflow breccia and lesser interbedded volcaniclastic conglomerate and tuffaceous sandstone (Biek and others, 2015). Exposures in the Sevier Plateau are the alluvial facies of the Mount Dutton Formation, re-interpreted as part of the Markagunt gravity slide, about 2000 feet thick on the southern end of the Sevier Plateau (Rowley and others, 1987; Biek and others, 2015).

The Eocene-Oligocene Brian Head Formation is mapped as non-tuffaceous sandstone and conglomerate, volcanic mudflow breccia, mafic lava flows, volcaniclastic

sandstone with minor limestone and chalcedony, ash-flow tuff (Biek and others, 2015). The unit consists dominantly of yellowish-gray and light-gray, cross-bedded, tuffaceous sandstone with interbedded pebble- to boulder-sized conglomerate, sandstone, and minor limestone and mudflow breccia (Maldonado and Moore, 1995).

The Eocene-Paleocene Claron Formation in the study area consists of the white limestone member and pink member. The Claron Formation consists of mudstone, siltstone, sandstone, limestone, and minor conglomerate deposited in fluvial, floodplain, and lacustrine environments of an intermontane basin (Mullet, 1989; Ott, 1999; Biek and others, 2015). The pink member is dominantly fluvial, while the white member is both fluvial and lacustrine (Goldstrand,1994; Bown and others, 1997). The lower white member consists of micritic limestone similar to the upper white limestone interval and forms a cliff or steep, ledgy, white slope. The lower limestone unit has a maximum thickness of about 300 feet at Bryce Point in BCNP (Bowers, 1990), and about 160 feet thick to the north on the southwest flank of the Sevier Plateau (Biek, 2015). Within BCNP at Inspiration Point, the lower limestone member is mostly white, pink, and pale-orange, slope-forming mudstone and siltstone with only minor limestone (Knudsen and others, in preparation).

The upper limestone unit of the white member is white, pale-yellowish-gray, pinkish-gray, and very pale orange micritic limestone and uncommon pelmicritic limestone, and typically about 80 to 100 feet thick on the southern flank of the Sevier Plateau (Biek and others, 2015). The pink member consists of micritic limestone, calcite-cemented sandstone, calcareous mudstone, and minor pebbly conglomerate that weather

to colluvium-covered ledgy slopes. The pink member is about 600 feet thick at Bryce Canyon National Park (Biek and others, 2015).

The Kaiparowits Formation is the light-brown, very fine grained sandstone and gray sandy mudstone (above the capping sandstone member of the Wahweap Formation) southwest of Tropic Reservoir (Bowers, 1990). The Kaiparowits Formation was deposited as an eastward-prograding clastic wedge in a relatively wet, subhumid alluvial plain with periodic to seasonal aridity near the western margin of the Late Cretaceous Western Interior Seaway (Roberts, 2007).

The Late Cretaceous Wahweap Formation overlies the Straight Cliffs Formation in the drainage basin; these two units are very similar, especially near their contact, and are commonly lumped together as an undivided map unit. The Wahweap Formation is mostly fine-grained sandstone, siltstone, and mudstone deposited in braided and meandering river and floodplain environments of a coastal plain (Lawton and others, 2003). Around Tropic Reservoir, because of extensive vegetative cover and poor geomorphic expression, three members of the Wahweap Formation are mapped as undivided, with the exception of the distinctive capping sandstone (Knudsen and others, in preparation).

The Late Cretaceous Straight Cliffs Formation consists of the Drip Tank and John Henry's Members in the study area. On the Paunsaugunt Plateau, the Drip Tank Member is white to light-gray, fine- to medium-grained quartzose sandstone, and, in the upper part of the unit, pebbly sandstone and pebbly conglomerate (Biek and others, 2015). The John Henry Member consists of variegated, gray, brown, and reddish-brown mudstone and thin- to thick-bedded, grayish-orange to yellowish-brown, fine-grained subarkosic

sandstone and forms ledgy slopes on the eastern margin of the BCNP boundary; in the area around Bulldog Hollow near the town of Tropic, the John Henry Member is stacked or amalgamated sandstone in the upper part of the unit. North of Tropic, a prominent 20- to 40-foot coal-rich interval is mapped as a marker bed (Knudsen and others, in preparation).

The principal structural elements of Johns Valley (Biek and others, 2015) include the Paunsaugunt fault zone, a northwest-side-down Quaternary normal fault that strikes northeast through Johns Valley along the eastern margin of the study area; the Pine Hills and Rubys Inn thrust faults, which strike east-west and bound the northern and southern boundaries, respectively, of Emery Valley; and the Johns Valley thrust fault northwest of Flake Mountain, which strikes northeast through the central part of Johns Valley in the northern part of the study area.

GROUNDWATER CONDITIONS

Introduction

Groundwater in Johns and Emery Valleys occurs in two types of aquifers: (1) valley-fill deposits, and (2) bedrock (figure 2). This study focuses on the valley-fill aquifer, which consists primarily of clay, silt, sand, and gravel and ranges in thickness from tens of feet to 200 feet. Tertiary and Cretaceous rocks may also yield water to some wells, but the number of wells screened in and water production from these units before this study were unknown. The limestone of the Claron Formation is part of the bedrock aquifer, along with Cretaceous sandstone formations, in the Emery Valley area. The East Fork Sevier River is sourced in the Paunsaugunt Plateau, enters the study area from the

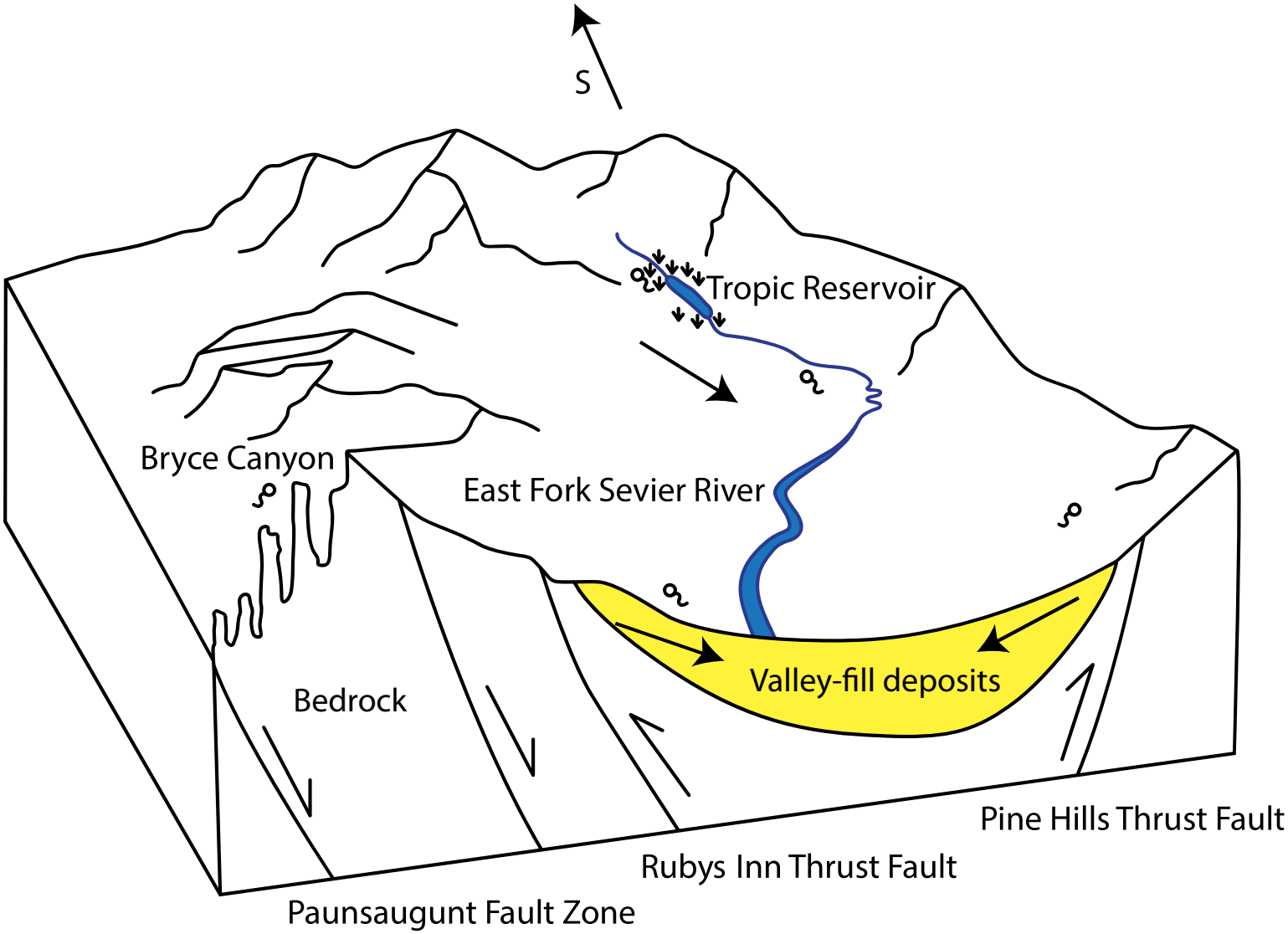

Figure 2. *Schematic block diagram showing groundwater conditions in Johns and Emery Valleys. Arrows indicate groundwater flow direction.*

south, and flows northeast through the study area in Johns and Emery Valleys. During seasonal irrigation (April to October), water from the East Fork Sevier River is diverted to the Tropic Ditch below Tropic Reservoir where it flows within a canal/ditch system toward the community of Tropic to the east.

Valley-Fill Aquifer

Occurrence

The valley-fill aquifer is an important source of drinking water in the Bryce Canyon City area. In general, the valley fill consists predominantly of stream alluvium and alluvial-fan deposits (Thiros and Brothers, 1993), which are generally coarser grained near basin margins, and finer grained along the lower reaches of streams and creeks and along floodplains in the central parts of the basin. Drillers' logs of water wells indicate that some wells intersect clay lenses, but no clay layers are extensive enough to act as a single, continuous confining layer, and the valley-fill aquifer is dominantly unconfined. Based on a review of well logs from the Utah Division of Water Rights database, the valley fill ranges in thickness from tens of feet near the basin margins to more than 100 feet below the valley floor, and up to 200 feet on Johnson Bench. Most valley-fill deposits are Quaternary stream alluvium (map unit Qaly of Biek and others, 2015), which consists of stream alluvium and stream-terrace alluvium and likely has high transmissivity.

Depth to water in the principal aquifer ranges from near surface level along the upper East Fork Sevier River to no greater than 200 feet. Unconfined groundwater is typically less than 10 feet deep adjacent to floodplains and shallow tributary alluvial

valleys, and in low-lying areas where phreatophytes and springs are common. Groundwater flows primarily from recharge areas and from Tropic Reservoir, and generally flows to the north-northeast, parallel to the East Fork Sevier River.

Groundwater Quality

Water quality and the potential for water-quality degradation are critical elements determining the extent and nature of future development in Johns and Emery Valleys. Most development is on unconsolidated valley-fill deposits, the primary source of groundwater. Unlike other Utah communities, the population of Bryce Canyon City decreased between 2010 and 2016, from 198 to 182 residents (Town Charts, 2018; http://www.towncharts.com/Utah/Demographics/Bryce-Canyon-City-town-UT-Demographics-data.html). However, this is an area of active tourism and therefore, potential future growth. Increased demand on drinking water would warrant careful land-use planning and resource management to preserve Johns and Emery Valleys' surface and groundwater resources. A preliminary search of water-quality data for the study area yielded only one sample from the Utah Department of Agriculture and Food (UDAF). A sample from a well in the northeastern corner of the study area taken in 2003 had a total-dissolved-solids (TDS) content of 218 mg/L, a pH of 8.5, and no constituents that exceeded secondary drinking-water or agricultural standards.

GROUNDWATER-QUALITY CLASSIFICATION DATA

To facilitate this groundwater-quality classification, the Utah Geological Survey sampled 32 wells and 22 springs during autumn 2018, spring 2019, autumn 2019, and spring 2021. These sites have water in both alluvial and bedrock material, though the

aquifer classification for this petition is for the valley fill only, we include these other sites to provide a more detailed background for water quality for the entire area.

We measured specific conductance in groundwater from 32 wells and 22 springs, groundwater from 24 wells and 16 springs was analyzed for general chemistry (appendix A), and groundwater from 27 wells and 16 springs was analyzed for nutrients by the Utah Department of Epidemiology and Laboratory Services (appendix A). We augmented our data with 14 sites within the USGS National Water Information System (NWIS) and UDAF databases for dissolved metals and pesticides. Select solutes analyzed for these sites include aluminum, arsenic, boron, barium, bromide, copper, lead, selenium, iron, manganese, fluoride, zinc, lithium, silicon, and uranium. Overall, water quality is characterized as calcium-magnesium bicarbonate type water (figure 3).

Total-Dissolved-Solids Concentrations

The Utah Water Quality Board's drinking-water quality (health) standard for TDS is 2000 mg/L for public-supply wells. The secondary groundwater quality standard is 500 mg/L (U.S. Environmental Protection Agency, 2006) and is primarily due to imparting a potential unpleasant taste to the water (Bjorklund and McGreevy, 1971). Plate 1 shows the distribution of TDS in Johns and Emery Valleys' valley-fill aquifer. Based on data from groundwater samples from 32 wells (26 from TDS and six wells from TDS converted from specific conductance data), TDS concentrations in the valley-fill and bedrock aquifers of Johns and Emery Valleys range from 151 to 530 mg/L, with no wells exceeding 1000 mg/L TDS and an overall average TDS concentration of 282 mg/L (appendix A, plate 1). The TDS concentration of 530 mg/L is from one of three bedrock

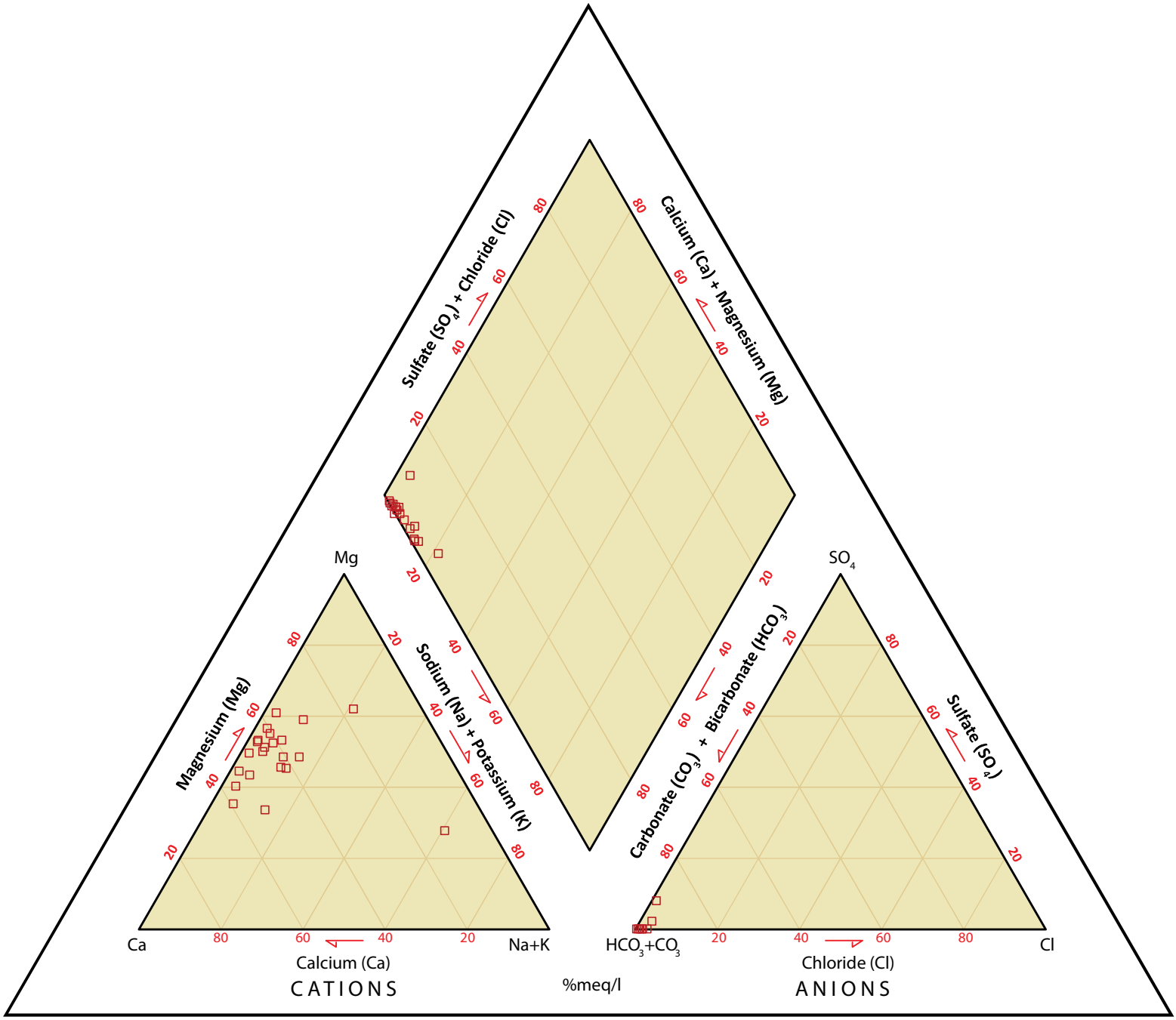

Figure 3. *General chemistry in Johns and Emery Valleys characterized by an overall calcium-magnesium bicarbonate water type.*

wells perforated in bedrock only, which is not classified as part of this aquifer petition (the other bedrock wells yield TDS of 192 and 416 mg/L). One well has a TDS of 514 mg/L (site 48; plate 1) that has perforations in both the alluvium and bedrock, just above the 500 mg/L Pristine quality cutoff, but because a single well cannot be classified, the overall valley-fill aquifer remains Class IA. The range of specific conductance for 54 wells and springs is from 240 to 884 µS/cm. We computed TDS concentrations from specific conductance measurements using a conversion factor of 0.63. This conversion factor was calculated by comparing TDS and specific conductance data collected in this study (figure 4). Using this conversion factor, we calculated TDS values for six wells and six springs sampled for this study. The converted TDS values range from 151 to 377 mg/L; all of these samples are below 500 mg/L and are classified as Pristine water quality as defined by the Utah Water Quality Board.

Nitrate Concentrations

The groundwater quality (health) standard for nitrate is 10 mg/L (U.S. Environmental Protection Agency, 2006). More than 10 mg/L of nitrate in drinking water can result in a condition known as methemoglobinemia, or "blue baby syndrome" (Comley, 1945; Fan and others, 1987; Bouchard and others, 1992) in infants under six months old and can be life threatening without immediate medical attention (U.S. Environmental Protection Agency, 2002). This condition is characterized by a reduced ability for blood to carry oxygen. Studies involving lab rats ingesting a combination of nitrate and heptamethyleneimine in drinking water reported an increase in tumor occurrence (Taylor and Lijinsky 1975). However, epidemiological investigations

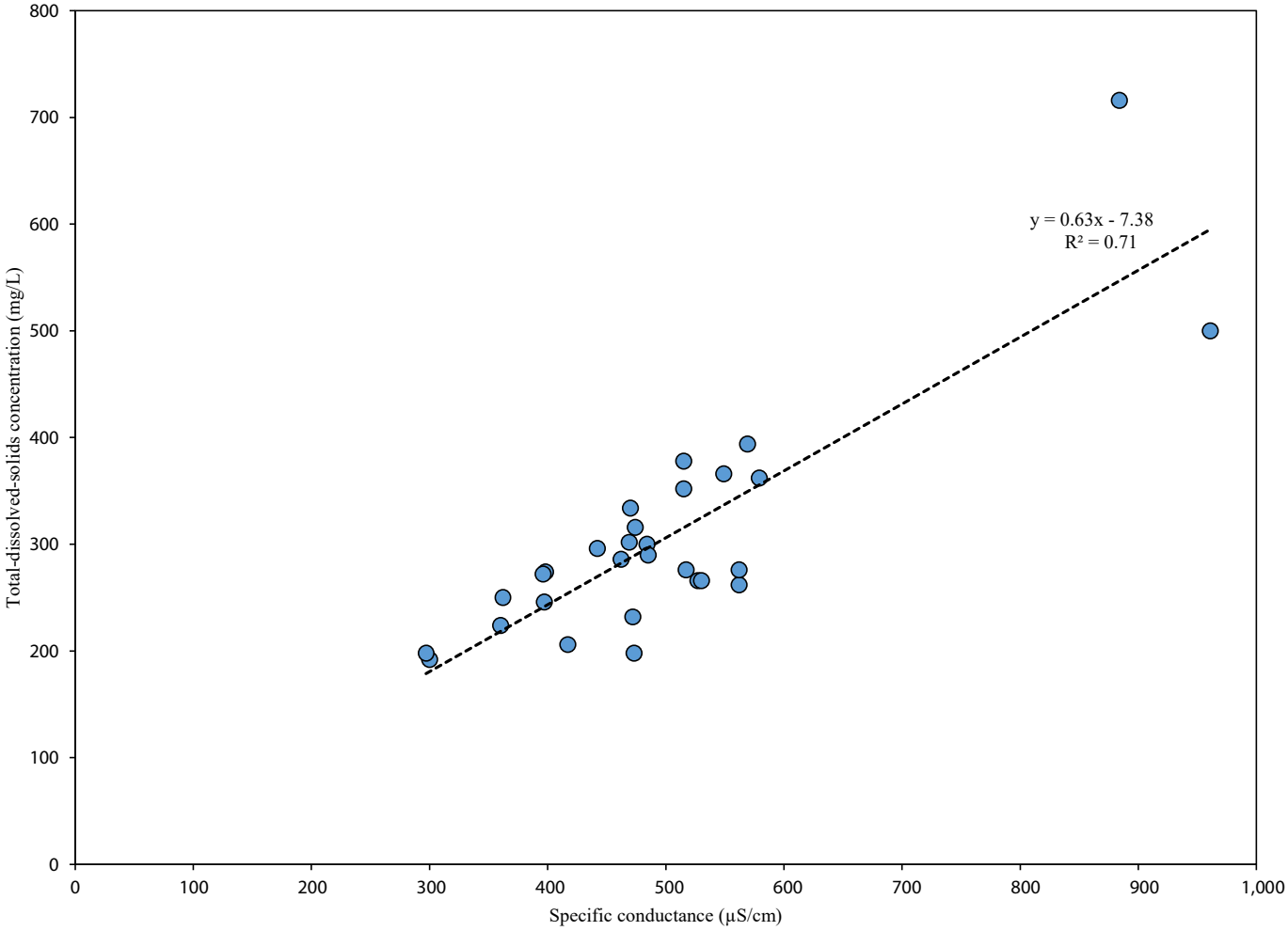

Figure 4. *Specific conductance versus total-dissolved-solids concentration data for 29 wells in Johns and Emery Valleys. R-squared is 0.71. Based on Hem's (1985) equation for estimating TDS from specific conductance: KA=S, where K=specific conductance, S=TDS, A ranges from 0.4 to 0.8 with an average A=0.63 (slope) used as the conversion factor to compute TDS in the study area.*

involving human beings have shown conflicting evidence. Stomach cancer in human beings associated with nitrate from drinking water has been reported in Columbia and Denmark (Cuello and others, 1976, Fraser and others, 1980). Conversely, investigations in the United Kingdom and other countries indicate no correlation exists between nitrate levels and cancer incidence (Forman, 1985; Al-Dabbagh and others, 1986; Croll and Hayes, 1988, Taneja, 2017).

Based on data from groundwater samples from 27 wells and 16 springs, nitrate-as-nitrogen concentrations range from less than 0.1 to 1.47 mg/L, with 42% of wells and springs yielding groundwater having concentrations below 0.1 mg/L, and an overall average nitrate concentration of 0.35 mg/L (appendix A). No apparent trend in the distribution of nitrate concentrations exists; the highest concentrations (1.06 and 1.47 mg/L) are likely attributed to proximity to stables/corrals and downgradient from septic systems (plate 3). All but one well had ammonia concentrations below the detection limit (0.05 mg/L); the well having a detectable ammonia concentration is below the Utah and EPA standard (appendix A).

Other Constituents

Based on the data presented in appendix A, no water from wells exceeded primary water-quality standards.

PROPOSED CLASSIFICATION

Under "Administrative Rules for Ground Water Quality Protection R317-6, December 1, 2019," Section 317-6-3, Ground Water Classes, Utah Administrative Code,

Utah's groundwater quality classes are based on TDS concentrations as shown in table 1. Two other classes, IB and IC, are not based on groundwater chemistry. Class IB groundwater, called Irreplaceable groundwater, is a source of water for a community public drinking-water system for which no reliable supply of comparable quality and quantity is available because of economic or institutional constraints; this class has not been considered as part of this petition. Class IC groundwater, called Ecologically Important groundwater, is a source of groundwater discharge important to the continued existence of wildlife habitat. Groundwater protection levels for classes IA and IB, as set under "Administrative Rules for Ground Water Quality Protection R317-6, December 1, 2019," Section 317-6-4, Ground Water Class Protection Levels, Utah Administrative Code, are more stringent than for other groundwater quality classes.

Garfield County is petitioning the Utah Water Quality Board to classify the principal valley-fill aquifer in Johns and Emery Valleys as shown on plate 2. The classification is based on data from groundwater from the 32 wells we sampled for TDS and augmented by UDAF and NWIS data from wells presented in appendix A. Where insufficient data exist, extrapolation of groundwater quality conditions is required. We based the extrapolation on local geologic characteristics.

Class IA- Pristine groundwater: TDS concentrations in the valley fill of Johns and Emery Valleys range from 151 to 512 mg/L (appendix A). Class IA areas are mapped throughout all of Johns and Emery Valleys (plate 2). Areas having Pristine water quality cover 100% of the total valley-fill material.

Table 1. *Groundwater quality classes under the Utah Water Quality Board total-dissolved-solids (TDS)-based classification system (modified from Utah Division of Water Quality, 1998).*

Groundwater Quality Class	**TDS Concentration**	**Beneficial Use**
Class IA/IB[1]/IC[2]	Less than 500 mg/L[3]	Pristine/Irreplaceable/ Ecologically Important
Class II	500 to less than 3000 mg/L	Drinking Water[4]
Class III	3,000 to less than 10,000 mg/L	Limited Use[5]
Class IV	10,000 mg/L and greater	Saline[6]

[1]Irreplaceable groundwater (Class IB) is a source of water for a community public drinking-water system for which no other reliable supply of comparable quality and quantity is available due to economic or institutional constraints; it is a groundwater quality class that is not based on TDS.
[2]Ecologically Important groundwater (Class IC) is a source of groundwater discharge important to the continued existence of wildlife habitat; it is a groundwater quality class that is not based on TDS.
[3]For concentrations less than 7000 mg/L, mg/L is about equal to parts per million (ppm).
[4]Water having TDS concentrations in the upper range of this class must generally undergo some treatment before being used as drinking water.
[5]Generally used for industrial purposes.
[6]May have economic value as brine.

CURRENT BENEFICIAL USES

In the study area, groundwater from the valley-fill aquifer is an important source of domestic and municipal culinary water for people living within the valley (Burden and others, 2007). Domestic use of municipal groundwater supply in 2018 was 2.3%; commercial use was 93.1%, and institutional use was 4.7% (Utah Division of Water Rights, 2019). Countywide, the three public-supply systems located in Johns and Emery Valleys use about 18.1% of total Garfield County municipal water supply (286 acre-feet compared to 1586 acre-feet of water by the entire county during 2018).

WATER-SUPPLY WELLS

There are 50 approved water wells in Johns and Emery Valleys based on Utah Division of Water Rights records, nine of which are public-supply wells (Deidre Beck, Division of Drinking Water, personal communication, February 2019). The location of all wells is shown on plate 2.

POTENTIAL CONTAMINANT SOURCES

We mapped potential groundwater contaminant sources including facilities related to mining, manufacturing, agricultural practices, and wastewater-treatment facilities (plate 3; appendix B). We mapped 104 potential contaminant sources in the following categories in Johns and Emery Valleys:

(1) Mining, which includes abandoned and active gravel mining operations and borrow pits that potentially contribute metals, solvents, and petroleum products.

(2) Agricultural practices, which consist of irrigated and non-irrigated crops, irrigation wells, active and abandoned animal feedlots, corrals, and stables/barnyards that potentially contribute nitrate.

(3) Industrial facilities that potentially contribute pesticides, metals, solvents, petroleum products, and polychlorinated biphenyl (PCB) spills associated with a variety of sources such as transportation facilities, salt storage facilities, transformer (power) stations, and cell towers.

(4) Small businesses, such as hotels, restaurants, retail shops, and commercial shooting ranges, some of which may contribute pollutants such as metals and solvents.

(5) Large lawns, including parks and cemeteries, that may contribute fertilizer and pesticides.

(6) Service stations including auto shops and gas stations that may contribute petroleum products, antifreeze, and solvents, and junkyard/salvage operations that may contribute pollutants such as metals and solvents.

(7) Waste-disposal sites that may contribute pollutants such as solvents, metals, and nitrate.

(8) Above-ground storage tanks that may contribute pollutants such as petroleum, metals, and solvents.

In addition to the above-described potential contaminants, septic tank soil-absorption systems are also present in Johns and Emery Valleys. Since 1978, 39 wastewater permits have been issued or are in process in our study area (Jeremy Roberts, Southeastern Utah Public Health Department, verbal/written communication, August 15,

2019). Outside of towns and cities, septic-tank systems in Garfield County, until recently, have been widely spaced. Within Bryce Canyon National Park, a few septic tanks still exist (Moyle Jones, personal communication, November, 2020) but were likely more prevalent historically within the Bryce Canyon City community. These domestic wastewater facilities could have contributed to nitrate concentrations in groundwater in the vicinity of town. Septic-tank systems may contribute contaminants such as nitrate and solvents.

EXISTING POLLUTION SOURCES

Existing pollution sources include those contaminants that have been documented and/or are currently being treated; potential contaminants address pollutants that have the potential to degrade groundwater. There are no known existing pollution sources in Johns and Emery Valleys.

GROUNDWATER FLOW

To construct potentiometric surfaces, we measured water levels in wells at four different times: autumn 2018, spring 2019, autumn 2019, and spring 2020. We calculated the elevation at most wells using a Trimble high-precision GPS having vertical accuracy of 10 centimeters. Water-level elevation at each well was determined by subtracting the measured depth to water from the land-surface elevation obtained from the GPS. The potentiometric surface for the autumn 2018 season shows conditions with water levels at their lowest measurement levels (in most wells); we use data from this potentiometric surface map to determine groundwater flow direction— perpendicular to contours on the

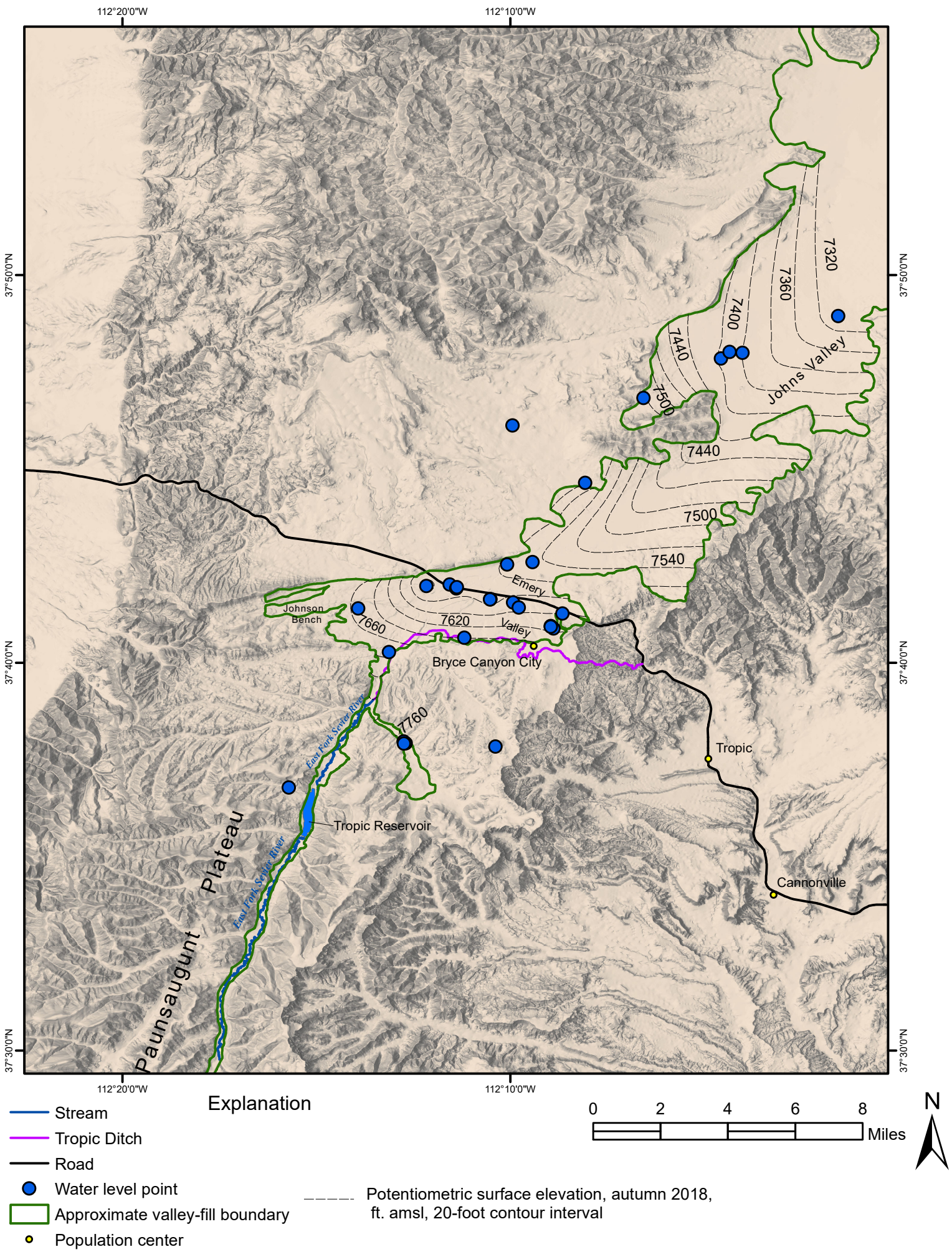

Figure 5. *Potentiometric surface map of water wells from autumn 2018. Overall direction of groundwater flow is to the north-northeast.*

potentiometric surface map (figure 5; plate 2). Groundwater flows from Tropic Reservoir to the north and from the valley margins toward the valley center, along the East Fork Sevier River, and eventually downstream (north and then northeast) toward Black Canyon where the East Fork Sevier River exits Johns Valley (figure 5; plate 2).

SUMMARY

Groundwater is the principal source of drinking water in Johns and Emery Valleys. While most of the development in Bryce Canyon City is on community sewer and public-water systems, most development in the county portion has single-family homes, with each lot-owner typically using their privately owned water well for water supply and a septic-tank system for wastewater disposal. These septic-tank systems are on valley-fill deposits, which are a major drinking-water aquifer for the valley residents. Groundwater quality classification is a tool that can be used in Utah to manage potential groundwater contamination sources and protect the quality of groundwater resources. The results of the proposed groundwater quality classification for the valley indicate that the valley-fill aquifer contains mostly high-quality groundwater resources that warrant protection. One hundred percent of the valley-fill in the area is classified as having Class IA groundwater based on chemical analyses of water from 54 wells and springs sampled during autumn 2018, spring 2019, and spring 2021.

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APPENDIX A

WATER-QUALITY DATA

(Site ID numbers shown on plate 1)

Appendix A. *Water quality data for Johns and Emery Valleys, Garfield County, Utah.*

Site ID	Site Type	Site Name	pH	pH Lab	Temp (°C)	Conductivity Field (µS/cm)	Conductivity Lab (µS/cm)	TDS (mg/L)	Phosphate (mg/L)	Ammonia(N) (mg/L)	Nitrite + Nitrate (mg/L)	TSS (mg/L)	Ca (mg/L)	Mg (mg/L)
BC6S	spring	Dipping Vat	7.9	7.07	8	470	449	226	0.0035	<0.05	0.352	<4	43.6	33.5
BC3S	spring	Hatch	8.12	7.07	11.4	428	414	214	0.0202	<0.05	0.504	199	48.9	25
BC15S	spring	Lower Berry	7.94	6.82	12.5	398	448	268	0.031	<0.05	<0.1	<4	56.8	17.9
BC8S	spring	Swamp	7.72	-	7.3	590	-	338	-	-	<0.1	-	-	-
BC10S	spring	NPS Bryce Spring 1	7.69	-	8.8	517	-	315	-	-	-	-	-	-
BC31S	spring	Tom Best Spring	7.92	6.82	10.8	332	333	198	0.159	<0.05	0.105	<4	40.4	15.6
BC2S	spring	Tropic 1	8.09	7.68	8.7	530	519	254	0.0042	<0.05	0.249	<4	39	47.8
BC4S	spring	Tropic 2	8.45	7.03	10.4	360	517	220	0.0032	<0.05	0.143	<4	34.4	35.2
BC17S	spring	Upper Berry	8.1	7.47	12.5	569	670	394	0.032	<0.05	-		64.1	45.2
BC62S	spring	Whiteman Spring	7.54	7.80	10.5	560	561	294	0.0198	<0.05	<0.1	152	61.6	41
BC34S	spring	Mossy Spring 1	7.65	6.77	10.6	479	481	266	-	-	-	490	45.6	35.5
BC35S	spring	Mossy Spring Cave	8.3	8.08	7.8	472	455	232	0.018	<0.05	0.367	65.6	42.3	35.2
BC36S	spring	Mossy Spring 3	7.97	-	10.1	531	-	324	-	-	-	-	-	-
BC11S	spring	NPS 4	7.45	6.87	8.2	510	504	254	0.0043	<0.05	<0.1	<4	54.8	37.4
BC53S	spring	Waterstop	7.8	7.68	7.6	455	441	220	<0.003	<0.05	0.223	<4	42.2	35.6
BC27W	well	Airport	8.13	8.02	14.3	469	517	262	0.0033	<0.05	0.111	<4	55.5	37.9
BC24W	well	BLM 2	8.2	7.04	-	365	1840	186	-	-	<0.1	10	28.8	23.5
BC19W	well	Kings Campground	8.45	7.07	9.2	371	371	192	<0.003	<0.05	<0.1	<4	34.3	28.2
BC28W	well	Landfill 1	7.57	6.82	10.2	426	426	234	0.033	<0.05	0.991	<4	35.9	28.7
BC29W	well	Landfill 2	7.67	6.99	10.8	561	561	308	0.034	<0.05	0.702	12.8	50.7	36.7
BC30W	well	Landfill 3	7.91	7.26	9.6	540	540	282	0.0151	<0.05	0.292	<4	55.3	39.1
BC13W	well	Poe	7.13	6.65	9.9	884	884	530	0.147	<0.05	<0.1	215	118	50.8
BC26W	well	Rich	8.01	7.13	12	585	585	310	0.024	<0.05	0.416	<4	55.8	36.1
BC7W	well	Ruby 4	8.18	6.85	16.3	345	333	182	-	-	0.602	-	50.9	13.7
BC20W	well	Ruby 1	-	7.06	-	542	546	286	<0.003	<0.05	<0.1	5.6	-	-
BC21W	well	Ruby 2	7.85	7.24	7.4	530	548	286	<0.003	<0.05	<0.1	<4	56.8	40.6
BC22W	well	Ruby 3	8	7.07	7.1	555	548	282	0.0031	<0.05	<0.1	<4	56.2	40.7
BC25W	well	UDOT	7.87	7.48	12.9	520	506	252	0.0045	<0.05	0.43	<4	48.8	34.4
BC12W	well	USFS Daves Hollow	7.51	7.07	8.1	664	619	324	0.0036	<0.05	<0.1	<4	69.8	43.5
BC37W	well	Ruby 5	8.33	6.78	12.7	309	328	192	0.0048	0.164	1.01	13.6	48.7	14.6
BC38W	well	Ruby 6	7.8	7.06	9.2	390	377	194	-	-	0.958	<4	50.3	15.7
BC39W	well	Ruby 7	-	-	-	-	-	-	-	-	0.953	-	-	-
BC40W	well	Elgin Elk Preserve	7.55	7.06	8.8	466	446	224	0.0074	<0.05	1.47	<4	32.8	31.2
BC44W	well	NPS 1	7.62	7.06	7.9	536	508	254	0.0039	<0.05	<0.1	<4	49.8	35.9
BC45W	well	NPS 3	7.21	-	7.8	594	-	362	-	-	-	-	-	-
BC46W	well	NPS 2	7.77	-	11.6	568	-	346	0.0045	<0.05	<0.1	-	-	-
BC48W	well	SITLA	7.72	6.55	9.2	928	931	512	0.0118	<0.05	0.312	<4	37.5	84.7
BC49W	well	Cottonwood	10.8	7.79	10.8	782	761	416	0.0043	<0.05	<0.1	4.8	70.5	58.8
BC51W	well	Bristlecone	7.47	7.78	9.4	515	674	354	0.021	<0.05	1.06	<4	55	43.4
BC61S	spring	Showalter Spring	-	8.01	-	536	620	384	-	-	-	<4	87.3	21.9

Appendix A. *Water quality data for Johns and Emery Valleys, Garfield County, Utah.*

Site ID	Site Type	Site Name	pH	pH Lab	Temp (°C)	Conductivity Field (µS/cm)	Conductivity Lab (µS/cm)	TDS (mg/L)	Phosphate (mg/L)	Ammonia(N) (mg/L)	Nitrite + Nitrate (mg/L)	TSS (mg/L)	Ca (mg/L)	Mg (mg/L)
BC60S	spring	Middle Berry	-	8.22	-	-	467	282	0.058	<0.05	0.325	15.6	58.1	17.1
BC64S	spring	Mossy Trail	8.3	8.20	10.4	453	486	246	0.0036	<0.05	0.349	16.4	47.3	36.6
BC65W	well	Sitla 2	8.03	7.64	11.9	411	430	210	0.033	<0.05	0.564	54.4	42	29
BC66W	well	Smith	7.66	7.03	10.6	478	478	256	0.0174	<0.05	0.231	<4	63.1	22.7
BC67W	well	Anderson	7.62	6.94	9.5	605	608	356	0.0088	<0.05	<0.1	7.6	60.4	40.5
BC68S	spring	Yovimpa	7.52	7.07	6.5	475	455	236	-	-	0.182	<4	57.8	29.1
BC70S	spring	Iron	6.74	-	8.9	596	-	364	-	-	<0.1	-	-	-
BC77S	spring	Ingram	7.77	-	6.7	503	-	307	-	-	0.3	-	-	-
BC84W	well	Highway 12 North Well	-	7.06	-	435	404	198	-	-	<0.1	<4	49.4	18.4
BC115W	well	SITLA Cottonwood Creek Well	-	-	8.4	240	-	151	-	-	-	-	-	-
BC116W	well	16068 Stock Well	-	-	7.7	523	-	329	-	-	-	-	-	-
BC117W	well	432226 Stock Well	-	-	7.4	447	-	282	-	-	-	-	-	-
BC118W	well	16066 Stock Well	-	-	7.1	250	-	158	-	-	-	-	-	-
BC119S	spring	Reynolds Spring	-	-	8.4	408	-	257	-	-	-	-	-	-
BC120W	well	432247 Stock Well	-	-	8.3	485	-	306	-	-	-	-	-	-
3250	well	UDAF site*	8.5	-	9.8	364	-	218	nd	nd	nd	-	28.86	27.18
374205112091501	well	NWIS** site	8.1	-	-	-	-	168	-	-	-	-	-	-
374205112091501	well	NWIS site	8.1	-	12	439	-	238	-	-	-	-	-	-
374205112091501	well	NWIS site	7.7	-	15	426	-	226	-	-	-	-	-	-
374205112091501	well	NWIS site	7.6	-	10	415	-	251	-	-	-	-	-	-
374205112091501	well	NWIS site	7.2	-	19.3	536	-	287	-	-	-	-	-	-
374205112091501	well	NWIS site	7.5	-	18.1	542	-	245	-	-	-	-	-	-
374855112054501	spring	NWIS site	-	-	-	445	-	271	-	-	-	-	-	-
374846112055001	well	NWIS site	7.8	-	10	408	-	246	-	-	-	-	-	-
374846112055001	well	NWIS site	-	-	10	375	-	233	-	-	-	-	-	-
374501112022901	well	NWIS site	7.7	-	7.5	440	-	224	-	-	-	-	-	-
373237112162101	well	NWIS site	7.8	-	5.7	445	-	34	-	-	-	-	-	-
373237112162101	well	NWIS site	7.7	-	6	410	-	214	-	-	-	-	-	-
373456112133501	well	NWIS site	8	-	6	455	-	243	-	-	-	-	-	-
373508112151701	well	NWIS site	7.5	-	6.5	435	-	28	-	-	-	-	-	-
373508112151701	well	NWIS site	7.6	-	7	475	-	255	-	-	-	-	-	-
373533112150901	well	NWIS site	7.6	-	6.5	390	-	6	-	-	-	-	-	-
373638112151801	well	NWIS site	7.6	-	7	485	-	297	-	-	-	-	-	-
373638112151801	well	NWIS site	7.5	-	7.5	505	-	271	-	-	-	-	-	-
373754112123901	well	NWIS site	7.5	-	7	520	-	267	-	-	-	-	-	-
374245112123901	well	NWIS site	7.5	-	-	840	-	422	-	-	-	-	-	-
374150112111501	well	NWIS site	7.4	-	-	480	-	260	-	-	-	-	-	-
374120112084201	well	NWIS site	7.8	-	9.5	305	-	167	-	-	-	-	-	-

Appendix A. *Water quality data for Johns and Emery Valleys, Garfield County, Utah.*

Site ID	Na (mg/L)	K (mg/L)	Cl (mg/L)	SO4 (mg/L)	Alkalinity (mg/L CaCO3)	CO3 solids(mg/L)	HCO3 (mg/L)	CO2(mg/L)	Hardness (mg/L)	Turbidity (NTU)	Al (mg/L)	As (µg/L)	B (µg/L)	Ba (mg/L)	Be (mg/L)	Br (µg/L)
BC6S	7.07	<1	6.17	<20	232	139	283	39.7	247	0.15	-	-	-	-	-	-
BC3S	5.04	<1	8.62	<20	196	118	239	33.6	225	25.2	-	-	-	-	-	-
BC15S	14.7	<1	8.74	<20	205	123	250	62.2	216	1.41	-	-	-	-	-	-
BC8S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC10S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC31S	11.3	1.4	3.59	<20	161	96.4	196	49	165	0.933	-	-	-	-	-	-
BC2S	3.93	<1	4.15	<20	273	164	333	11.4	294	0.485	-	-	-	-	-	-
BC4S	2.59	<1	3.5	<20	220	132	268	40.7	231	0.636	-	-	-	-	-	-
BC17S	21.9	3.86	15.2	<20	336	202	410	23	346	93.9	-	-	-	-	-	-
BC62S	3.23	<1	3.57	<20	298	179	363	9.4	323	119	-	-	-	-	-	-
BC34S	5.19	1.82	8.18	<20	253	152	309	86.9	260	237	-	-	-	-	-	-
BC35S	4.47	1.82	6.88	<20	236	141	288	3.9	251	83.3	-	-	-	-	-	-
BC36S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC11S	2.93	<1	3.5	<20	265	159	323	71.5	291	0.302	-	-	-	-	-	-
BC53S	2.94	<1	3.56	<20	230	138	281	9.49	252	0.365	-	-	-	-	-	-
BC27W	3.36	<1	3.5	<20	270	162	329	5.06	295	0.23	-	-	-	-	-	-
BC24W	10.6	1.98	9.13	<20	165	99.2	202	30.3	169	14.1	-	-	-	-	-	-
BC19W	3.04	1.99	4.45	<20	181	109	221	31	202	0.392	-	-	-	-	-	-
BC28W	15.6	1.46	8.6	<20	206	123	251	62.1	208	0.33	-	-	-	-	-	-
BC29W	14.3	2.02	9.54	<20	270	162	329	55.4	278	2.68	-	-	-	-	-	-
BC30W	6.27	1.38	6.11	<20	270	162	329	29.5	299	0.214	-	-	-	-	-	-
BC13W	7.27	1.37	10.1	111	358	215	437	162	504	133	-	-	-	-	-	-
BC26W	16.9	1.21	20.8	<20	264	158	322	38.7	288	0.828	-	-	-	-	-	-
BC7W	2.68	<1	3.5	<20	160	95.8	195	45.1	184	0.485	-	-	-	-	-	-
BC20W	-	-	3.64	<20	292	175	356	50.3	-	2.4	-	-	-	-	-	-
BC21W	2.88	<1	3.53	<20	288	173	351	33.1	309	0.284	-	-	-	-	-	-
BC22W	2.71	<1	3.5	<20	273	164	333	46.6	308	0.143	-	-	-	-	-	-
BC25W	9.06	1.23	8.3	<20	241	145	295	15.9	254	0.339	-	-	-	-	-	-
BC12W	2.73	<1	3.55	<20	322	193	393	55.1	353	16.1	-	-	-	-	-	-
BC37W	2.94	<1	9.84	<20	155	93.1	189	51.5	182	1.72	-	-	-	-	-	-
BC38W	3.49	<1	12.1	<20	169	102	207	29.4	190	0.49	-	-	-	-	-	-
BC39W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC40W	11.9	1.07	10.6	<20	203	132	248	35.3	210	0.566	-	-	-	-	-	-
BC44W	2.93	<1	3.5	<20	268	161	326	46.5	272	0.451	-	-	-	-	-	-
BC45W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC46W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC48W	53.2	2.89	29.3	34	417	250	509	234	443	<0.1	-	-	-	-	-	-
BC49W	16.4	1.29	12.4	<20	385	231	470	12.3	418	32.7	-	-	-	-	-	-
BC51W	22	1.13	47.3	<20	266	159	324	8.73	316	2.43	-	-	-	-	-	-
BC61S	15.1	5.3	9.38	<20	319	191	389	6.13	308	2.02	-	-	-	-	-	-

Appendix A. *Water quality data for Johns and Emery Valleys, Garfield County, Utah.*

Site ID	Na (mg/L)	K (mg/L)	Cl (mg/L)	SO4 (mg/L)	Alkalinity (mg/L CaCO3)	CO3 solids(mg/L)	HCO3 (mg/L)	CO2(mg/L)	Hardness (mg/L)	Turbidity (NTU)	Al (mg/L)	As (µg/L)	B (µg/L)	Ba (mg/L)	Be (mg/L)	Br (µg/L)
BC60S	12.2	<1	10.5	<20	221	133	270	2.61	216	6.55	-	-	-	-	-	-
BC64S	5.22	1.94	7.39	<20	248	149	302	3.11	269	2.29	-	-	-	-	-	-
BC65W	7.04	1.56	3.76	<20	213	128	260	9.85	224	3.01	-	-	-	-	-	-
BC66W	5.77	1.12	6.84	<20	240	144	293	45.3	251	0.486	-	-	-	-	-	-
BC67W	21.4	2.07	8.49	<20	304	183	371	70.7	318	13.7	-	-	-	-	-	-
BC68S	2.03	<1	3.5	<20	244	147	298	41.9	264	0.117	-	-	-	-	-	-
BC70S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC77S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC84W	5.86	1.69	7.71	<20	190	114	232	33	199	13.9	-	-	-	-	-	-
BC115W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC116W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC117W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC118W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC119S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC120W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3250	4.78	1.07	nd	2.97	-	-	3.76	-	3.3	-	nd	nd	nd	0.31	nd	-
374205112091501	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
374205112091501	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
374205112091501	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
374205112091501	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-
374205112091501	-	-	-	-	-	-	-	-	-	-	-	0.31	-	-	-	0.035
374205112091501	-	-	-	-	-	-	-	-	-	-	-	0.62	-	-	-	0.037
374855112054501	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-
374846112055001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
374846112055001	-	-	-	-	-	-	-	-	-	-	-	-	30	-	-	-
374501112022901	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-
373237112162101	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-
373237112162101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
373456112133501	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-
373508112151701	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-
373508112151701	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
373533112150901	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-
373638112151801	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-
373638112151801	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
373754112123901	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
374245112123901	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
374150112111501	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
374120112084201	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. *Water quality data for Johns and Emery Valleys, Garfield County, Utah.*

Site ID	Cd (mg/L)	Co (mg/L)	Cr (mg/L)	Cu (mg/L)	F (mg/L)	Fe (µg/L)	Li (mg/L)	Mn (µg/L)	Mo (µg/L)	Pb (mg/L)	Se (µg/L)	Si (mg/L SiO2)	U (µg/L)	V (mg/L)	Zn (mg/L)	Pesticides
BC6S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC3S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC15S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC8S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC10S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC31S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC2S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC4S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC17S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC62S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC34S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC35S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC36S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC11S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC53S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC27W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC24W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC19W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC28W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC29W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC30W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC13W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC26W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC7W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC20W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC21W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC22W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC25W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC12W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC37W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC38W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC39W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC40W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC44W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC45W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC46W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC48W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC49W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC51W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC61S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. *Water quality data for Johns and Emery Valleys, Garfield County, Utah.*

Site ID	Cd (mg/L)	Co (mg/L)	Cr (mg/L)	Cu (mg/L)	F (mg/L)	Fe (µg/L)	Li (mg/L)	Mn (µg/L)	Mo (µg/L)	Pb (mg/L)	Se (µg/L)	Si (mg/L SiO2)	U (µg/L)	V (mg/L)	Zn (mg/L)	Pesticides
BC60S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC64S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC65W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC66W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC67W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC68S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC70S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC77S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC84W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC115W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC116W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC117W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC118W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC119S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BC120W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3250	nd	nd	nd	nd	-	nd	0.13	nd	nd	nd	nd	-	-	nd	nd	see footnote
374205112091501	-	-	-	-	0.1	160	-	-	-	-	-	12	-	-	-	-
374205112091501	-	-	-	-	-	100	-	-	-	-	-	8.8	-	-	-	-
374205112091501	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-
374205112091501	-	-	-	-	0.1	580	-	25	-	-	< 1	9	-	-	-	-
374205112091501	-	-	-	-	0.13	5	-	< 0.16	0.38	-	0.34	7.61	1.59	-	-	-
374205112091501	-	-	-	-	0.17	< 10	-	0.21	0.364	-	0.31	7.86	1.63	-	-	-
374855112054501	-	-	-	-	0.3	20	-	< 10	-	-	-	27	-	-	-	-
374846112055001	-	-	-	-	0.2	-	-	-	-	-	-	30	-	-	-	-
374846112055001	-	-	-	-	0.3	8	-	< 1	-	-	< 1	29	-	-	-	-
374501112022901	-	-	-	-	0.2	< 10	-	< 1	-	-	-	7.4	-	-	-	-
373237112162101	-	-	-	-	0.1	10	-	-	-	-	-	6.3	-	-	-	-
373237112162101	-	-	-	-	0.2	< 9	-	< 3	-	-	-	6.1	-	-	-	-
373456112133501	-	-	-	-	0.2	< 10	-	< 1	-	-	-	6.8	-	-	-	-
373508112151701	-	-	-	-	0.2	20	-	-	-	-	-	7.1	-	-	-	-
373508112151701	-	-	-	-	0.3	10	-	< 3	-	-	-	6.9	-	-	-	-
373533112150901	-	-	-	-	0.2	< 10	-	-	-	-	-	6.4	-	-	-	-
373638112151801	-	-	-	-	0.2	< 10	-	< 1	-	-	-	6.8	-	-	-	-
373638112151801	-	-	-	-	0.3	< 9	-	< 3	-	-	-	6.7	-	-	-	-
373754112123901	-	-	-	-	0.5	< 10	-	-	-	-	-	6.9	-	-	-	-
374245112123901	-	-	-	-	0.4	< 10	-	-	-	-	-	9.3	-	-	-	-
374150112111501	-	-	-	-	0.2	100	-	50	-	-	-	7.9	-	-	-	-
374120112084201	-	-	-	-	0.6	30	-	-	-	-	-	7.2	-	-	-	-

TDS = total dissolved solids
TSS = total suspended solids
NTU = nephelometric turbidity units
nd = non-detect

*Well water was analyzed for these pesticides by the Utah Department of Agriculture and Food having no detect: Hexachlorocyclopentadiene Alpha Chlordane 2,4,5-TP (Silvex) Hexachlorobenzene Dieldrin Picloram Simazine * Endrin Aldicarb Atrazine * Methoxychlor Aldicarb sulfone Gamma-Lindane Chlordane "T" Aldicarb sulfoxide Heptachlor Toxaphene "T" Carbofuran Alachlor * Prometon Methomyl Aldrin Dicamba Oxamyl (Vydate) Heptachlor-Epoxide 2,4-D 3-OH Carbofuran Gamma Chlordane PCP 3-Keto Carbofuran Disulfton Diazinon Metolachlor

**Data from USGS National Water Information System

APPENDIX B

POTENTIAL CONTAMINANT INVENTORY DATA

Appendix B. *Potential contaminant inventory for Johns and Emery Valleys, Garfield County, Utah.*

FIELD ID	TYPE	Description of potential contaminant	Pollutant
1	AFO[1]	equestrian campground	fertilizers, manure, nitrates
2	Waste Disposal	RV dump station	metals, solvents, nitrates
3	AFO	horse corral	fertilizers, manure, nitrates
4	Former AFO	abandoned corral	fertilizers, manure, nitrates
5	AFO	corral	fertilizers, manure, nitrates
6	Service station	service station	solvents, petroleum
7	Business	RV park	metals, solvents, nitrates
8	AFO	horse corral	fertilizers, manure, nitrates
9	Junk Yard/Salvage	junk site	metals, solvents, petroleum
10	AFO	corral	fertilizers, manure, nitrates
11	Business	hotel, restaurant	solvents
12	AFO	horse corral, rodeo arena	fertilizers, manure, nitrates
13	AFO	corral	fertilizers, manure, nitrates
14	AFO	corral	fertilizers, manure, nitrates
15	Government	rest area	solvents, nitrates
16	Government	guard station	metals, solvents, petroleum
17	AFO	corral	fertilizers, manure, nitrates
18	Junk Yard/Salvage	personal junk yard	metals, solvents, petroleum
19	Former AFO	abandoned corral	fertilizers, manure, nitrates
20	Junk Yard/Salvage	junk site	metals, solvents, petroleum
21	Former AFO	abandoned corral	fertilizers, manure, nitrates
22	Mining	inactive borrow pit	metals, solvents, petroleum
23	Former AFO	abandoned corral	fertilizers, manure, nitrates
24	Business, AFO	wildlife museum, ATV storage, exotic animal corral	fertilizers, manure, nitrates
25	Mining	inactive borrow pit	metals, solvents, petroleum
26	Mining	inactive borrow pit	metals, solvents, petroleum
27	Business	hotel, restaurant	solvents
28	AFO	mule/horse corral	fertilizers, manure, nitrates
29	Former AFO	abandoned corral	fertilizers, manure, nitrates
30	Government	waste disposal, automotive storage/scrap yard	metals, solvents, petroleum
31	Junk Yard/Salvage	junk site	metals, solvents, petroleum
32	Mining	gravel pit	metals, solvents, petroleum
33	Government	maintenance yard, paint shop, automotive repair	metals, solvents, petroleum
34	Mining	inactive borrow pit	metals, solvents, petroleum
35	Waste Disposal	sewage lagoons	metals, solvents, nitrates
36	Government	radio towers	metals, solvents
37	Industry	power sub station	PCBs
38	Former AFO	abandoned corral	fertilizers, manure, nitrates
39	Junk Yard/Salvage	junk site	metals, solvents, petroleum
40	AFO	coral	fertilizers, manure, nitrates
41	Business	hotel, restaurant	solvents
42	Service station	abandoned service station	metals, solvents, petroleum
43	AFO	elk preserve	fertilizers, manure, nitrates
44	Waste Disposal	RV dump station	metals, solvents, nitrates
45	Mining	inactive borrow pit	metals, solvents, petroleum
46	AFO	horse corral	fertilizers, manure, nitrates
47	AFO	corral	fertilizers, manure, nitrates
48	Mining	inactive borrow pit	metals, solvents, petroleum
49	Junk Yard/Salvage	auto scrap yard/storage	metals, solvents, petroleum
50	AFO	horse corrals	fertilizers, manure, nitrates
51	Business	RV park	metals, solvents, nitrates
52	Waste Disposal	RV dump station	metals, solvents, nitrates
53	Waste Disposal	sewage lagoons	metals, solvents, nitrates
54	Business, Large Lawn	hotel, large lawns	pesticides, fertilizer
55	Mining	inactive borrow pit	metals, solvents, petroleum
56	Government	fire station	metals, solvents, petroleum
57	Business	maintenance yard, automotive repair	metals, solvents, petroleum
58	Business	restaurants	solvents
59	Service station	service station	solvents, petroleum
60	Large Lawn	park	pesticides, fertilizer

Appendix B. *Potential contaminant inventory for Johns and Emery Valleys, Garfield County, Utah.*

FIELD ID	TYPE	Description of potential contaminant	Pollutant
61	Waste Disposal	RV dump station	metals, solvents, nitrates
62	Business	gift shop, restaurants	solvents
63	AFO	horse corral	fertilizers, manure, nitrates
64	Junk Yard/Salvage	personal junk yard	metals, solvents, petroleum
65	Industry	airport	metals, solvents, petroleum
66	Business	hotel, restaurants	solvents
67	Business, Large Lawn	restaurant, large lawn	pesticides, fertilizer
68	AFO	corral, rodeo grounds	fertilizers, manure, nitrates
69	Business, Large Lawn	hotel, large lawn	solvents, pesticides, fertilizers
70	Business	hotel	solvents
71	Industry	power sub station	PCBs
72	Business	abandoned restaurant	metals, solvents
73	Large Lawn	cemetary	pesticides, fertilizer
74	Business	RV park	metals, solvents, nitrates
75	Shooting range	shooting range	metals
76	Industry	cell tower	metals, solvents
77	AFO	corral	fertilizers, manure, nitrates
78	Junk Yard/Salvage	junk site	metals, solvents, petroleum
79	Former AFO	abandoned corral	fertilizers, manure, nitrates
80	Industry	cell tower	metals, solvents
81	Waste Disposal	landfill	metals, solvents, petroleum
82	Former AFO	abandoned corral	fertilizers, manure, nitrates
83	Junk Yard/Salvage	junk site	metals, solvents, petroleum
84	Former AFO	abandoned corral	fertilizers, manure, nitrates
85	Junk Yard/Salvage	junk site	metals, solvents, petroleum
86	Former AFO	abandoned corral	fertilizers, manure, nitrates
87	AFO	corral	fertilizers, manure, nitrates
88	AFO	corral	fertilizers, manure, nitrates
89	AFO	corral	fertilizers, manure, nitrates
90	Former AFO	abandoned corral	fertilizers, manure, nitrates
91	Mining	gravel pit	metals, solvents, petroleum
92	AFO	corral	fertilizers, manure, nitrates
93	AFO	corral	fertilizers, manure, nitrates
94	AFO	corral	fertilizers, manure, nitrates
95	AFO	corral	fertilizers, manure, nitrates
96	Former AFO	abandoned corral	fertilizers, manure, nitrates
97	AFO	corral	fertilizers, manure, nitrates
98	Former AFO	abandoned corral	fertilizers, manure, nitrates
99	Junk Yard/Salvage	personal junk yard	metals, solvents, petroleum
100	AFO	corral	fertilizers, manure, nitrates
101	AST[2]	above-ground storage tank	metals, solvents, petroleum
102	AST	above-ground storage tank	metals, solvents, petroleum
103	AST	above-ground storage tank	metals, solvents, petroleum
104	AST	above-ground storage tank	metals, solvents, petroleum

[1] - Animal Feed Operation

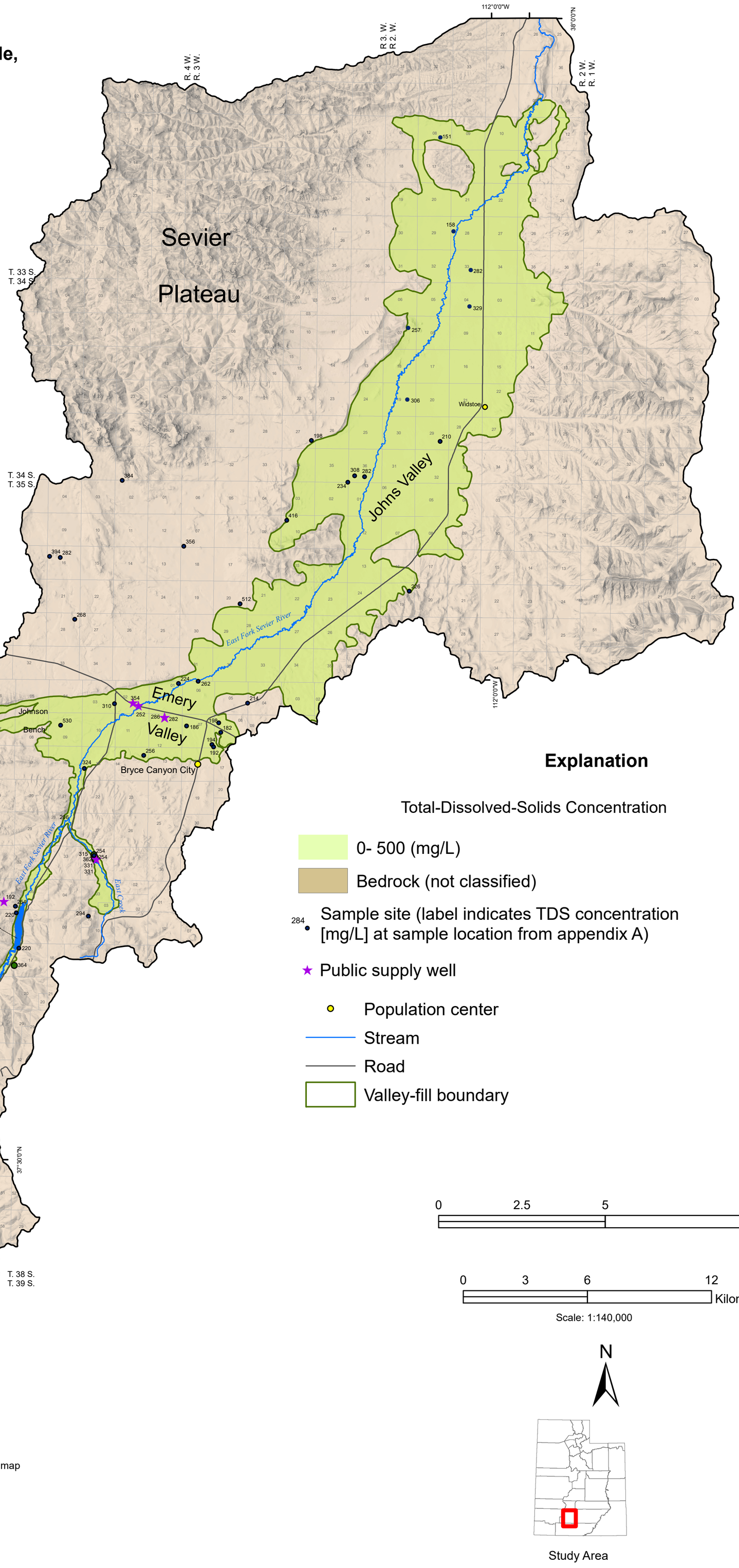
[2] - Above-ground Storage Tank

Plate 1

Total Dissolved Solids, Johns and Emery Valleys, Garfield County, Utah

By
Janae Wallace and Trevor Schlossnagle,
Utah Geological Survey

2021



UTAH DNR GEOLOGICAL SURVEY

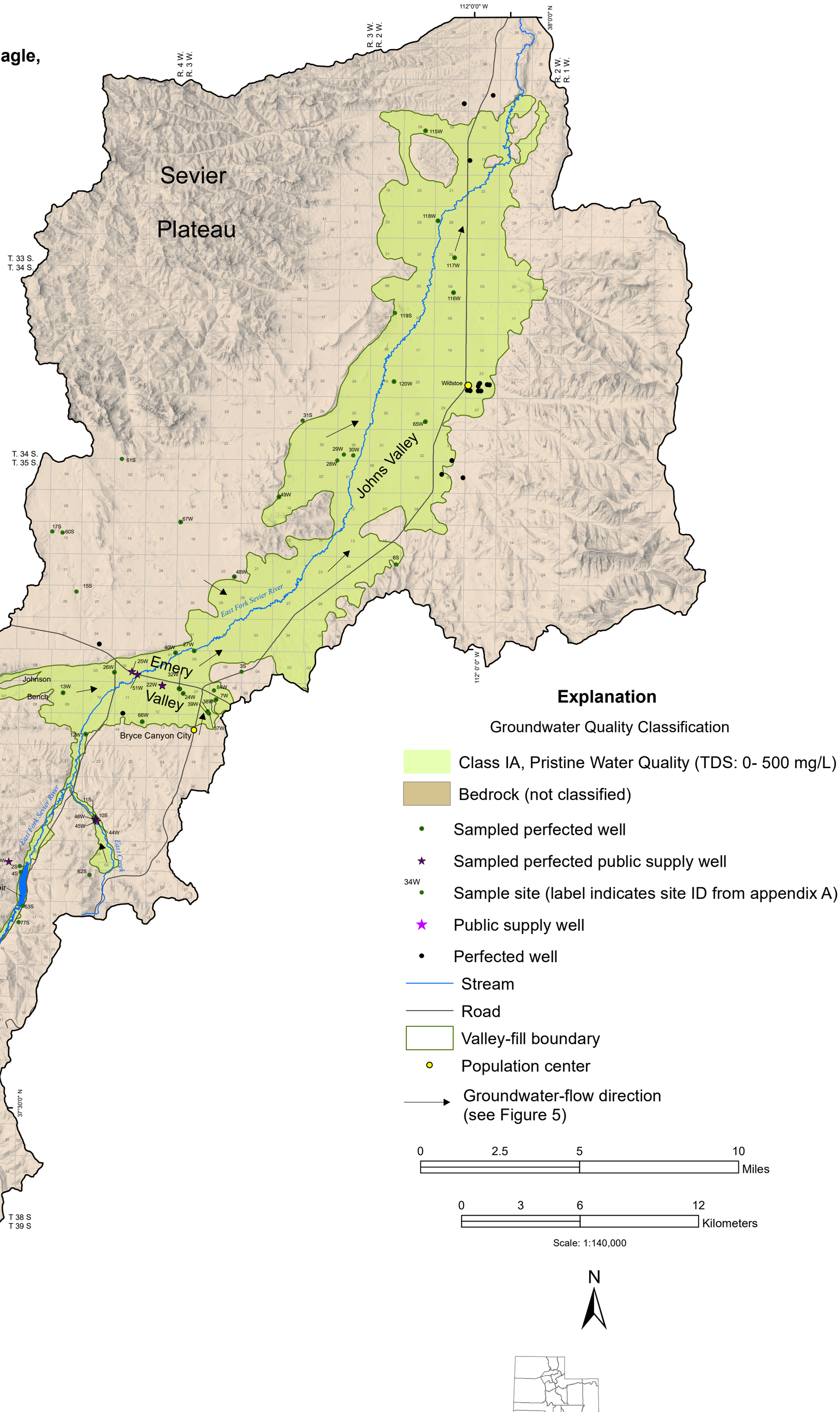
This map was created from GIS files. Basemap constructed from features obtained from the Utah AGRC.
Projection: UTM
Datum: NAD 83 Zone 12N
Cartography by Nathan Payne

Plate 2

Groundwater Quality Classification, Johns and Emery Valleys, Garfield County, Utah

By
Janae Wallace and Trevor Schlossnagle,
Utah Geological Survey

2021



Explanation

Groundwater Quality Classification

- Class IA, Pristine Water Quality (TDS: 0- 500 mg/L)
- Bedrock (not classified)
- Sampled perfected well
- Sampled perfected public supply well
- 34W Sample site (label indicates site ID from appendix A)
- Public supply well
- Perfected well
- Stream
- Road
- Valley-fill boundary
- Population center
- Groundwater-flow direction (see Figure 5)

0 2.5 5 10 Miles

0 3 6 12 Kilometers

Scale: 1:140,000

N

Study Area

UTAH DNR GEOLOGICAL SURVEY

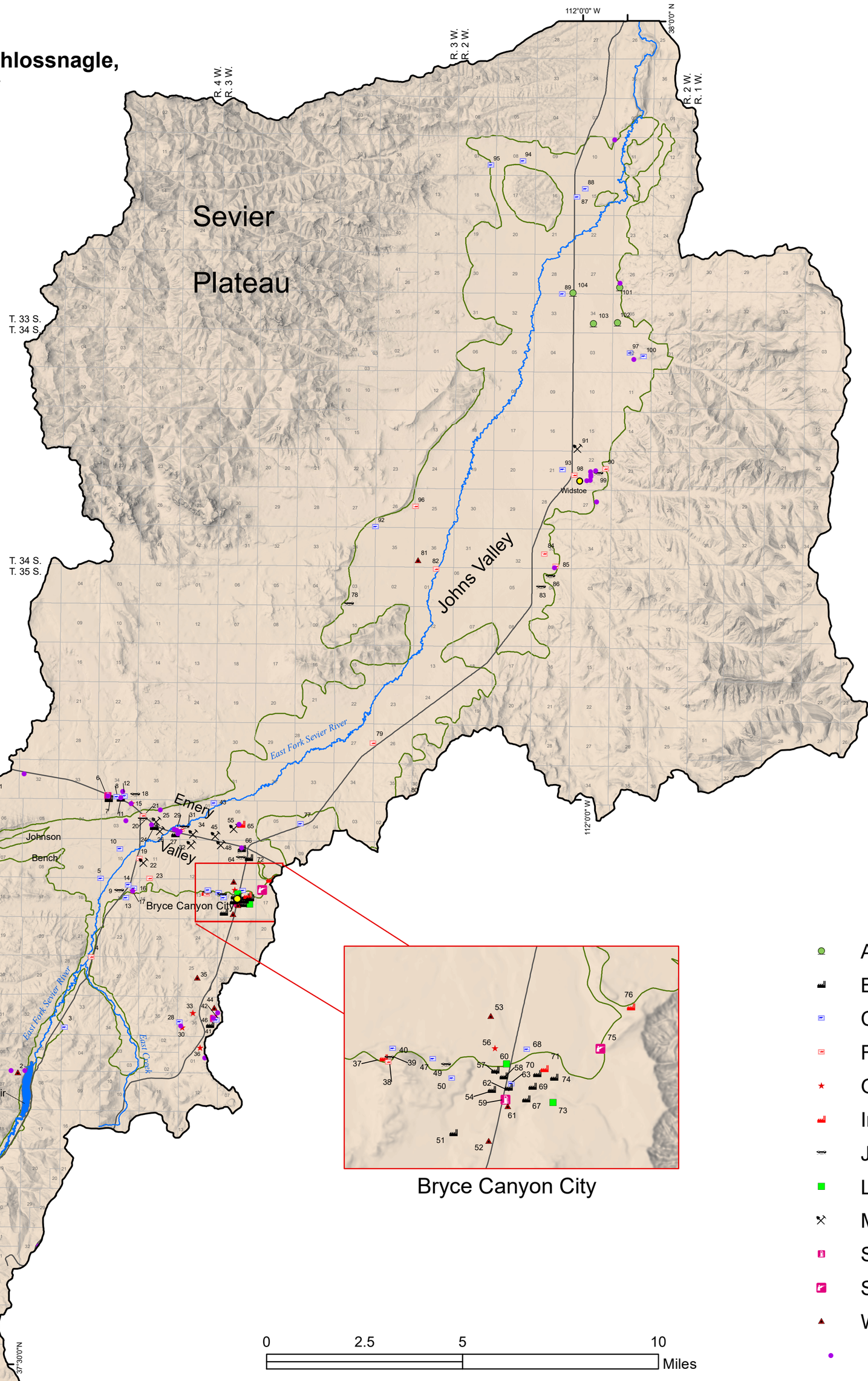
This map was created from GIS files. Basemap constructed from features obtained from the Utah AGRC.
Projection: UTM
Datum: NAD 83 Zone 12N
Cartography by Nathan Payne

Plate 3

Potential Contaminant Sources, Johns and Emery Valleys, Garfield County, Utah

By
Janae Wallace and Trevor Schlossnagle,
Utah Geological Survey

2021



Potential Contaminants
(see appendix B for description of numbered contaminants)

- Above-ground storage tank
- Business
- Current animal feed operation
- Former animal feed operation
- Government
- Industry
- Junk yard/salvage
- Large lawn
- Mining
- Service station
- Shooting range
- Waste disposal
- Septic system
- Vault toilet
- Population center
- Stream
- Road
- Valley-fill boundary

Study Area

This map was created from GIS files. Basemap constructed from features obtained from the Utah AGRC.
Projection: UTM
Datum: NAD 83 Zone 12N
Cartography by Nathan Payne

DWQ-2021-006975