Agenda

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF DRINKING WATER
Kenneth H. Bousfield, P.E.
Director

DRINKING WATER BOARD MEETING

November 7, 2014 - 1:00 pm
Multi Agency State Office Building - Room 1015
195 North 1950 West
Salt Lake City, Utah 84116

Ken Bousfield's Cell Phone #: (801) 674-2557

1. Call to Order – Chairman Hansen
2. Roll Call – Ken Bousfield
3. Introductions – Chairman Hansen
4. Approval of the Minutes:
   - A. August 27, 2014
   - B. October 14, 2014
5. Financial Assistance Committee Report
   - A. Status Report – Michael Grange
   - B. Project Priority List – Michael Grange
   - C. SRF Applications
     - i. STATE:
       - a) Ticaboo Special Service District – Gary Kobzeff
     - ii. FEDERAL:
       - a) Central Iron County Water Conservancy District – Julie Cobleigh
       - b) Dagget County / Dutch John – Jesse Johnson
       - c) West Erda Improvement District – Julie Cobleigh
     - iii. OTHER:
6. Drinking Water Energy Efficiency Initiative
   - A. Documents and Presentations – Ken Bousfield
   - B. Drinking Water Boards' Direction on Energy Efficiency Initiative Incentives

7. Final Adoption of Rule Revision

    A. R309-400 – Water System Rating Criteria (Improvement Priority System) – To Be Determined
    B. R309-545 – Drinking Water Storage Tanks – Ying Ying Macauley
    C. R309-550 – Transmission and Distribution Pipelines – Ying Ying Macauley

8. Intent to Solicit Informal Comments

    A. *R309-500 – Plan Review, Operation, and Maintenance Requirements* – Ying Ying Macauley

9. Rural Water Association Report – Dale Pierson

10. Chairman's Report

11. Directors Report

    A. Drinking Water Boards' 2015 Meeting Schedule
    B. ASDWA Annual Conference October 20-23, 2014

12. Next Board Meeting:

    Date: January 9, 2015
    Time: 1:00 pm
    Place: Multi Agency State Office Building
    Room 1015
    195 North 1950 West
    Salt Lake City, Utah 84116

13. Other

14. Adjourn

In compliance with the American Disabilities Act, individuals with special needs (including auxiliary communicative aids and services) should contact Dana Powers, Office of Human Resources, at: (801) 499-2117, TDD (801) 536-4414, at least five working days prior to the scheduled meeting.

Agenda Item 4(A)

State of Utah

GARY R. HERBERT
Governor

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Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF DRINKING WATER
Kenneth H. Bousfield, P.E.
Director

DRINKING WATER BOARD MEETING
Wednesday, August 27, 2014 – 2:00 pm
Davis Conference Center, Zephyr Room
1651 North 700 West
Layton, Utah 84041

DRAFT MINUTES

1. **Call to Order – Chairman Hansen**

Paul Hansen, Board Chairman, called the meeting to order at 2:05 pm.

2. **Roll Call – Ken Bousfield**

Board Members present: Paul Hansen, Betty Naylor, Tage Flint, Roger Fridal, and David Sakrison.

Board Members excused: Brett Chynoweth, Brad Johnson, David Stevens, and Mark Stevens

Division Staff present: Ken Bousfield, Michael Grange, Heather Bobb, Marianne Booth, and Rich Peterson

3. **Introductions – Chairman Hansen**

Paul Hansen, Board Chairman, welcomed everyone to the meeting and requested that those in the audience introduce themselves.

Those in attendance were:

- Brian Pattee and Curtis Ludvigson representing the Rural Water Association of Utah.
- Roger Fulgham representing the Rural Water Association of Utah and Tremonton City.
- Henry Allred, Board Member, representing Cedarview Montwell Special Service District.

4. **Approval of the Minutes:**

A. July 18, 2014 Board Meeting

- Tage Flint moved to approve the minutes. Roger Fridal seconded. The motion was carried unanimously by the Board.

❖ Paul Hansen, Board Chairman, requested that agenda item number 7 be addressed next as Tage Flint may have needed to leave the meeting in order to make a previously scheduled flight. Item number 7 was the only other item requiring a vote by a quorum of Board Members, and with Tage absent, there would not be a quorum to act.

7. Operator Certification Commission Member Appointment – Ken Bousfield

Ken Bousfield, Director of the Division of Drinking Water (DDW, the Division) informed the board that Jim Callison's current term on the Operator Certification Commission (OCC) will be over at the end of this year and as Jim has served very well, Division staff recommends appointing him to a new term.

In response to questions, Ken informed the Board that Jim is associated with Utah Valley University and represents the Joint Training Coordinating Committee.

- David Sakrison moved to re-appoint Jim Callison to the Operator Certification Commission for another 3 year term. Betty Naylor seconded. The motion was carried unanimously by the Board.

5. **Financial Assistance Committee Report**

A. Status Report – Michael Grange

Michael Grange, Construction Assistance Section Manager with the Division, reported that the State Loan Fund currently has just over $200,000, and with the $5.5 million in expected funding, the Division is projecting the fund will have approximately $5.8 million by August 1, 2015.

Michael Grange also reported that the Federal SRF currently has $31 million and with the expected $15 million in funding, the Division is projecting the fund will have approximately $46.5 million by August 1, 2015.

Michael then gave some background information on the funding, stating that two competing proposals for funding go before Congress; one from the House, approximately $755 million this year; and one from the Senate, approximately $900 million this year. He then explained that this money is allocated based on a Drinking Water Infrastructure Needs Survey conducted by the US EPA, and in 2011 Utah fully participated and is recognized as a 1.04% state, meaning that Utah will get 1.04% of the total Drinking Water SRF amount authorized by Congress.

Michael updated the Board on the Town of Stockton, reminding them of the fire that burned their main water storage tank. He then went on to state that Stockton is currently

working with their insurance company on funding and requirements; and that as soon as that is worked out, Stockton will work with Division staff to put together a packet to bring before the Board. Michael also stated that in talking with other engineers, there could be additional new projects coming before the Board, ranging from $2 to $4 million.

In response to questions from the Board, Michael updated them on the status of the funds that were authorized but not yet closed. They were (in no particular order):

- Wooden Shoe Water Company: Closed after the printing of the handout.
- Pleasantview City: Authorized $1.97 million in January 2014. Still considering whether to accept or not. They have until January 2015.
- Duchesne County, Victory Pipeline: Still in the process of procuring easement rights and their authorization from the Bureau of Indian Affairs needs to be modified. Estimated closing is the end of September 2014.
- Herriman: Authorized $4.5 million in March 2012. Using a special assessment area to repay their bond. They are currently using interim financing until construction is complete and then will close for the exact amount.
- Greendale Water Company: They are still going through a public comment period.
- Sheep Creek Cove: No current update.
- Forest Glen A: Their authorization from the Forest Service stated that DDW would be responsible for design and construction of the infrastructure, and will have to be modified as that is incorrect. Estimated closing is November or December or 2014.
- Boulder Farmstead: Authorized in May 2014. No current update.
- White Hills Water Company: Because they have been authorized within the last 2 or 3 years, the attorney can use some information on the new documents; this will speed up the process for them. Estimated closing is January to February of 2015.

6. **Drinking Water Energy Efficiency**

A. Documents and Presentations - Ken Bousfield

i. Cost Saving Opportunities Through Implementing Energy Efficiency Strategies

ii. Conserving Energy and Power in a Water System

iii. Rural Water Association of Utah Energy Efficiency Presentation

Ken Bousfield, Director of DDW, introduced DDW's Drinking Water Energy (Cost) Savings Handbook (handout 6(A)(i)) that the Division has prepared, in conjunction with individuals as noted on the Acknowledgement page of the Handbook. Ken explained each chapter of the handbook as follows:

1) Introduction section, which gives information on the energy savings potential, how to use the handbook, finding the right consultant, and the Board's SRF fund.
2) Energy Saving Investigation Process, which hasn't yet been finalized, will list energy saving ideas. This chapter will be divided into three sections:
    a) things water system personnel can do
    b) things water system personnel can do with the help of consultants, and
    c) things involving construction and/or equipment replacement.

    This chapter will be provided by Doug Evans, who has already achieved a savings of $300,000 per year for his water system (handout 6(A)(ii)).
3) Funding Opportunities which addresses available funding options and step by step instructions on how to procure it.

4) Appendix which will have web links containing helpful and supporting information.

Ken went on to explain that DDW staff will be giving presentations on this handbook (handout 6(A)(iii)) at this RWAU 2014 Fall Conference, August 28, 2014, the Intermountain Section of the American Water Works Association's Annual Conference on September 11th, the League of Cities and Towns 2014 Annual Conference on September 12th, and the RWAU 2015 Annual Conference in February 2015. Ken also stated that they are hoping to present it at the 2015 Utah City Engineer Conference, January 22nd and 23rd, as well.

i. Water Energy Summit

Ken Bousfield informed the Board that Senator Margaret Dayton, (R-Utah), is promoting a Water Energy Summit that will be held on Thursday, January 22, 2015 at the Utah Government Trust Building. Ken stated that the Utah Office of Energy Development, Senator Dayton and he, all have differing topics and the agenda has not yet been finalized. Handout 6(A)(iv) lists Ken's ideas for the Summit.

B. Drinking Water Boards Direction on Interest Rate Reductions for Energy Efficient Applicants – Michael Grange

Michael Grange started out by posing 3 questions to the Board; what kind of incentive do we offer for implementing energy efficiency; how much of an incentive do we offer; and how do we apply that incentive? He then explained that there are different levels of energy audits; level 1 is a planning audit, level 2 includes the low cost or no cost measures, and level 3 audits will involve capital intensive measures. Michael then posed the question of whether to base the incentive on a modification of table 2 calculations (a series of calculations used to determine the interest rate on authorized funding) or to offer a direct interest rate reduction?

Michael then explained that the handout included what the audit levels were and some different examples and ideas from Division staff on how to apply incentives. Michael also made sure to note that this process is just beginning and these are just some talking points for the Board to consider and deliberate on, not a recommendation from the Division.

After a lengthy discussion, including the Green Project Reserve Option, standard criteria on conducting audits, generating reports, baselines for water systems, determining bonus points, thresholds, et cetera; the Board decided that it would take the time to do research and then meet the morning of the November 7, 2014 Drinking Water Board meeting to further discuss this item and get input from other Board members before making any decisions on incentivizing energy efficiency.

8. Rural Water Association Report – Dale Pierson

Curtis Ludvigson, Development Specialist for RWAU, apologized on behalf of Dale Pierson, Executive Director of RWAU, for his absence, as Dale had a conflicting out of state meeting and expressed appreciation to the Board for their attendance at the Conference.

9. Chairman's Report

Paul Hansen, Board Chairman, had nothing additional to report.

10. Directors Report

Ken Bousfield mentioned that DDW was seeking authority to implement a Certification Program for Energy Efficiency counselors. The target audience would be engineers and water system personnel. Ken directed the Board's attention back to Doug Evans' list of improvement ideas (handout 6(A)(ii)) and noted that it included more than 300 ideas. He went on to explain that the certification program is intended to ensure that advice givers are cognizant of the breadth of available ideas. Ken went on to explain that he would need statutory authority and funding to implement the Certification Program.

11. Next Board Meeting:

Date:	November 7, 2014
Time:	1:00 pm
Place:	Multi Agency State Office Building Room 1015 195 North 1950 West Salt Lake City, Utah 84116

12. Other

13. Adjourn

- Betty Naylor moved to adjourn the Drinking Water Board Meeting. Roger Fridal seconded. The motion was carried unanimously by the Board.

Meeting adjourned at 3:02 pm.

In compliance with the American Disabilities Act, individuals with special needs (including auxiliary communicative aids and services) should contact Dana Powers, Office of Human Resources, at: (801) 499-2117, TDD (801) 536-4414, at least five working days prior to the scheduled meeting.

Agenda Item 4(B)

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF DRINKING WATER
Kenneth H. Bousfield, P.E.
Director

DRINKING WATER BOARD MEETING
Tuesday, October 14, 2014 – 11:00 am
Multi Agency State Office Building
195 North 1950 West
Salt Lake City, Utah 84116
Teleconference 1-877-820-7831 Pin#: 878776#

DRAFT MINUTES

1. **Call to Order – Chairman Hansen**

Paul Hansen, Board Chairman, called the meeting to order at 11:03 am.

2. **Roll Call – Ken Bousfield**

Board members attending telephonically: Paul Hansen, Betty Naylor, Brett Chynoweth, Brad Johnson, and David Sakrison. Roger Fridal joined at approximately 11:06 am.

Board members excused: Tage Flint, David Stevens, and Mark Stevens.

Division staff present: Ken Bousfield, Rich Peterson, Heather Bobb, and Marianne Booth.

3. **Introductions – Chairman Hansen**

Paul Hansen, Board Chairman, welcomed everyone and asked that they introduce themselves.

Attending telephonically was:
- Bruce Warren, President of the Forest Glen A Homeowners Association.

4. **Financial Assistance Committee Report**

A. SRF Applications

i. STATE:

ii. FEDERAL:

a) Forest Glen A – Rich Peterson

Betty Naylor, Board Vice-Chairman, stated that the Forest Glen A project consists of doing a complete rebuild of their water system, including redeveloping their spring, a new water storage tank, and transmissions lines. She went on to state that this project was brought before the Board and was

approved a loan on February 27, 2014. They are coming before the Board today to request additional funding, as project bids came in over the approved amount. Division staff recommends that the Board authorize a loan of $1, 438,986 with an interest rate of 0% for 30 years with $438,986 in principal forgiveness, on the condition that they resolve all issues on their compliance report.

It was discussed that the increase of the loan would be $188,986.00 and that the average water bill for users would go from the current $33.33 per month, to $112.02 per month. Paul Hansen made note that the Board looks at the financeability of a project, and it is the water supplier's responsibility to determine the water rates for its users.

- Brett Chynoweth moved to authorize a $1,438,986 loan at 0% interest for 30 years, with $438,986 in principal forgiveness to the Forest Glen A Homeowners Association, with the condition that they resolve all issues on their compliance report. Roger Fridal seconded. The motion was carried unanimously by the Board.

iii. OTHER:

5. **Next Board Meeting:**

Date: November 7, 2014
Time: 1:00 pm
Place: Multi Agency State Office Building
Room 1015
195 North 1950 West
Salt Lake City, Utah 84116

6. **Other**

Paul Hansen noted that the next Financial Assistance Committee meeting would be held Wednesday, October 15, 2014, at 9:00 am, in advance of the next scheduled Board meeting.

Ken Bousfield informed the Board that there will be a working meeting the morning of November 7th before the official Board meeting. Details of the working meeting and the Board meeting will be sent to Board members. Paul Hansen reminded the Board members that this was planned at the last Board meeting in order to discuss the Board's direction on implementing interest rate reductions for projects incorporating energy efficiency measures.

7. **Adjourn**

- Betty Naylor moved to adjourn the Drinking Water Board Meeting. Brett Chynoweth seconded. The motion was carried unanimously by the Board.

Meeting adjourned at 11:11 am

In compliance with the American Disabilities Act, individuals with special needs (including auxiliary communicative aids and services) should contact Dana Powers, Office of Human Resources, at: (801) 499-2117, TDD (801) 536-4414, at least five working days prior to the scheduled meeting.

Agenda Item 5(A)

DIVISION OF DRINKING WATER

STATE LOAN FUNDS

AS OF September 30, 2014

	SUMMARY		
	Total State Fund:	$3,104,611	
	Total State Hardship Fund:	$1,084,936	
	Subtotal:	$4,189,547	
LESS AUTHORIZED	Less:		
	Authorized Loans & Closed loans in construction:	$2,483,000	*(see Page 2 for details)*
	Authorized Hardship:	$344,875	
	Subtotal:	$2,827,875	
	Total available after Authorized deducted	**$1,361,672**	
PROPOSED	**Proposed Loan Project(s):**	**$700,000**	*(see Page 2 for details)*
	Proposed Hardship Project(s):	**$0**	
	Subtotal:	**$700,000**	
AS OF:			
September 30, 2014	**TOTAL REMAINING STATE LOAN FUNDS:**	**-$78,389**	
	TOTAL REMAINING STATE HARDSHIP FUNDS:	**$740,061**	

Total Balance of ALL Funds: **$661,672**

Projected Receipts Next Twelve Months:			
and Sales Tax Revenue			
Annual Maximum Sales Tax Projection	**$3,587,500**		
	$0		
Less State Match for 2015 Federal Grant	($1,560,000)		
Less Appropriation to DDW	($800,000)		
Less Administration Fees	($145,700)		
SUBTOTAL Sales Tax Revenue including adjustments:		$1,081,800	
Payment:			
Interest on Investments (Both Loan and Hardship Accounts)		$24,000	
Principal payments		$3,515,700	**Receive 80% in January**
Interest payments		$1,020,300	
Total Projections:		$5,641,800	

Total Estimated State SRF Funds Available through 10-01-2015	**$6,303,472**

DIVISION OF DRINKING WATER
STATE LOAN FUNDS
PROJECTS AUTHORIZED BUT NOT YET CLOSED
AS OF September 30, 2014

Community	Loan #	Cost Estimate	Date Authorized	Date Closed/Anticipated	Authorized Funding		
					Loan	Grant	Total
							0
							0
Trenton Town 1.5% int 30 yrs	3S196	422,139	May-14		145,000	145,075	290,075
							0
Subtotal Loans and Grants Authorized					145,000	145,075	290,075
PLANNING LOANS / GRANTS IN PROCESS							
Henrieville Town 0% int 5 yrs	3S189P	36,000	Jun-13	Sep-13	36,000		36,000
Tabiona	3S192P	32,000	Sep-13	??	32,000		32,000
Coalville pl loan 5 yrs 0% int	3S186P	32,000	Jul-13	Sep-13	32,000		32,000
Fairview	3S198P	38,000	Jun-14	Aug-14	38,000		38,000
Hildale pl grant	3S194P	40,000	Jan-14	Mar-14		40,000	40,000
West Erda Imp Dist - pl grnt	3S197P	39,800	Jun-14			39,800	39,800
Hanksville	3S199P	40,000	Jul-14	Jul-14		40,000	40,000
Glen Canyon-Big Water Town	3S200P	40,000	Jul-14	Jul-14		40,000	40,000
Cedarview Montwell SSD	3S201P	40,000	Jul-14			40,000	40,000
					138,000	199,800	337,800
CLOSED LOANS (partially disbursed)							
Payson, 3.46% int, 20 yrs	3S170	3,404,000	Nov-11	Apr-12	908,000		908,000
Woods Cross 0% int 20 yrs	3S195	3,275,000	Jul-13	Feb-13	1,292,000		1,292,000
							0
							0
Subtotal Planning Loans/Grants Auth					2,200,000	0	2,200,000
Total authorized or closed but not yet funded					$2,483,000	$344,875	$2,827,875
PROPOSED PROJECTS for Aug 2014							
Ticaboo	3S206	700,000			700,000	0	700,000
		0			0	0	0
		0			0	0	0
							0
Total Proposed Projects					700,000	0	700,000

DIVISION OF DRINKING WATER
STATE LOAN FUNDS
AS OF September 30, 2014

	5235 Loan Funds	5240 Interest (use for Grants)	Total
Cash:	$3,104,611	$1,084,936	$4,189,547
Less:			
Loans & Grants authorized but not yet closed (schedule attached)	(283,000)	(344,875)	(627,875)
Loans & Grants closed but not fully disbursed (schedule attached)	(2,200,000)	0	(2,200,000)
Proposed loans & grants	(700,000)	0	(700,000)
Administrative quarterly charge for entire year	(145,700)		(145,700)
Appropriation to DDW	(800,000)		(800,000)
	0		0
FY 2015 Federal SRF 20% match of $7,570,000	(1,560,000)		(1,560,000)
	(2,584,089)	**740,061**	**(1,844,028)**
Projected repayments during the next twelve months			
Thru 10-01-2015			
Principal	3,515,700		3,515,700
Interest		1,020,300	1,020,300
Projected annual investment earnings on invested cash balance		24,000	24,000
Sales Tax allocation thru Oct-01-2015	3,587,500		3,587,500
Total	**$4,519,111**	**$1,784,361**	**$6,303,472**
* All interest is added to the Hardship Fee account.			

DIVISION OF DRINKING WATER
FEDERAL SRF
AS OF September 30, 2014

FIRST ROUND FUND	
1997 thru 2014 SRF Grants	
Net Federal SRF Grants:	$144,595,581
Total State Matches:	$31,540,300
Closed Loans:	-$176,135,881
Total Grant Dollars:	**$0**

FEDERAL SECOND ROUND FUND	
Principal Repayments	
Principal (P):	$34,952,862
Interest (I):	$9,398,156
Total P & I:	**$44,351,018**

Earnings on Invested Cash Balance	
Total:	**$1,151,229**

Hardship Fund	
Total:	**$2,647,983**

SUMMARY	
Total Federal State Revolving Fund:	$45,502,247
Total Federal Hardship Fund:	$2,647,983
Subtotal:	$48,150,229

LESS AUTHORIZED & PARTIALLY DISBURSED		
Less:		
Authorized & Partially Disbursed Closed Loans:	$14,942,908	*(see Page 2 for details)*
Authorized Federal Hardship:	$523,348	
Subtotal:	$15,466,256	

PROPOSED		
Proposed Federal Project(s):	**$462,000**	*(see Page 2 for details)*
Proposed Federal Hardship Project(s):	**$0**	
Subtotal:	**$462,000**	

AS OF:		
September 30, 2014	**TOTAL REMAINING LOAN FUNDS:**	**$30,097,339**
	TOTAL REMAINING HARDSHIP FUNDS:	**$2,124,634**

Total Balance of ALL Funds after deducting proposed actions: $32,221,973

Projected Receipts thru October 1, 2015		
2015 Fed SRF Grant	$6,056,000	
2015 State Match	$1,514,000	
Interest on Investments	$201,600	
Principal Payments	$5,774,246	**Receive 60% in January**
Interest	$1,426,487	
Hardship & Technical Assistance fees	$420,176	
Total:	$15,392,509	

Total Estimated Federal SRF Funds Available through: 10/1/2015 **$47,614,482**

DIVISION OF DRINKING WATER
FEDERAL STATE REVOVING FUND

PROJECTS AUTHORIZED BUT NOT YET CLOSED
AS OF September 30, 2014

COMMUNITY	Project			Authorized Date	Closing Date Scheduled	Authorized From Loan Funds (1st or 2nd Round)			Hardship Fund
	Total Project	Terms	Loan #			Loan	Forgiveness	Total	
Herriman	8,375,000	2.25% hgf, 20 yrs	3F194	Mar-12	Sep-15	4,682,000		4,682,000	
Greendale Water Co	1,385,000	3.92 int/hgf, 20 yrs	3F213	Jul-13	Mar-15	1,145,000		1,145,000	
Sheep Creek Cove HOA	90,000	4.82% int, 20 yr	3F218	Jan-14		90,000		90,000	
Pleasant View City	2,327,000	3.75% int, 20 yrs	3F219	Jan-14		1,977,000		1,977,000	
Forest Glen A	1,418,000	0% int, 30 yrs	3F222	Feb-14	Sep-14	986,000	432,000	1,418,000	
Big Plains - Cedar Point	83,000	100% PF	3F224P	May-14		41,000	42,000	83,000	
Boulder Farmstead	2,000,000	0% INT, 30 yrs	3F225	May-14		1,000,000	1,000,000	2,000,000	
White Hills	1,047,000	1% int, 30 yr	3F226	Jul-14		519,000	518,000	1,037,000	
								0	
					TOTAL CONSTRUCTION AUTHORIZED:	**$ 10,440,000**	**$ 1,992,000**	**$ 12,432,000**	**$ -**
COMMITTED PLANNING ADVANCES / AGREEMENTS or PARTIALLY DISBURSED CLOSED 2ND ROUND AGREEMENTS:									
					Date Closed				
								0	0
Kane Co-Zion View	1,400,000	4.71% int, 30 yrs	3F185	Mar-12	Jul-12	725,000		725,000	0
Duchesne County WID	22,000,000	0% int 30 yrs 700K pf	3F142	Mar-10	Oct-14	1,085,908	700,000	1,785,908	
Rural Water Assn of Utah	124,758	5 yr contract for Development Specialist	Ongoing	Nov-12	Jan-13			0	463,054
Woodland Mutual Wtr Co.	37,000	Planning Loan 0% 5 yrs	3F206P	Nov-12	May-13			0	37,000
Rockville Pipeline Co	36,700	Planning Grant	3F220P	Feb-14	Mar-14			0	17,825
Marble Hills	28,167	100% Principal Forgiveness	3F227	Jul-14	Aug-14			0	5,469
					TOTAL PLANNING AUTHORIZED:	**$1,810,908**	**$700,000**	**$2,510,908**	**$523,348**
				TOTAL CONSTRUCTION & PLANNING:				**$14,942,908**	**$523,348**
				AVAILABLE PROJECT FUNDS:					**$30,559,339**
				AVAILABLE HARDSHIP FUNDS:					**$2,124,634**
PROPOSED PROJECTS FOR AUGUST 2014:									
Central Iron County WCD	100,000	0.0% 5 yrs $50,000 PF	3F230			50,000	50,000	100,000	
Dutch John	362,000		3F231			362,000		362,000	
					TOTAL PROPOSED PROJECTS FOR THIS MEETING:	**$412,000**	**$50,000**	**$462,000**	**$0**
*RWAU hardship grant is being disbursed monthly									
				TOTAL FUNDS AFTER PROPOSED PROJECTS ARE FUNDED:					**$30,097,339**
				TOTAL FUNDS AFTER PROPOSED HS PROJECTS ARE FUNDED:					**$2,124,634**
NOTES OF LOAN CLOSINGS SINCE LAST BOARD MEETING:									
Total Recent Loan Closings						**$0**	**$0**	**$0**	**$0**

DIVISION OF DRINKING WATER
FEDERAL SRF LOAN FUNDS
AS OF September 30, 2014

	Loan Funds 1st Round	Loan Payments 2nd Round Principal	Loan Payments 2nd Round Interest	Loan Payments Hardship Fund	TOTAL
Federal Capitalization Grants and State 20% match thru 2013	$176,135,881				
Earnings on Invested 1st Round Funds			1,151,229		
Repayments (including interest earnings on 2nd round receipts)		34,952,862	9,398,156	2,647,983	224,286,110
Less:					
Closed loans and grants	-176,135,881				-176,135,881
SUBTOTAL of Funds Available	**$0**	**$34,952,862**	**$10,549,385**	**$2,647,983**	**$48,150,229**
Loans & Grants authorized but not yet closed or fully disbursed	-9,652,000	-4,590,908	-700,000	-523,348	-15,466,256
SUBTOTAL of Funds Available less Authorized	**-$9,652,000**	**$30,361,954**	**$9,849,385**	**$2,124,634**	**$32,683,973**
Future Estimates:					
Proposed Loans/Grants for current board package	-462,000			0	-462,000
SUBTOTAL of Funds Available less Proposed Loans & Grants	**-$10,114,000**	**$30,361,954**	**$9,849,385**	**$2,124,634**	**$32,221,973**
PROJECTIONS THRU October-2015					
2015 Grant proceeds estimate (inc state match)	0				
2014 Grant $9,000,000 less set-asides	6,056,000				
2014 State Match for Grant	1,514,000				
Projected repayments & revenue during the next twelve months		5,774,246	1,426,487	420,176	7,620,909
Projected annual investment earnings on invested cash balance		180,000	12,000	9,600	201,600
TOTAL	**-$2,544,000**	**$36,316,200**	**$11,287,872**	**$2,554,410**	**$47,614,482**

Agenda Item 5(B)

Project Priority List
Presented to the Drinking Water Board
November 7, 2014, 2014

DRINKING WATER BOARD
PACKET FOR PROJECT PRIORITY LIST

There are three new projects being added to the Project Priority List:

West Erda Improvement District is being added to the Project Priority List with 82.6 points. Their project consists of a connection to Erda Acres Water and the Tooele Valley Airport, and distribution system upgrades.

Ticaboo Utility Improvement District is being added to the Project Priority List with 18.5 points. Their project consists of replacing a well pump and a pump house.

Dutch John is being added to the project priority list with 18.4 points. Their project consists of tank repair, water meters and treatment.

FINANCIAL ASSISTANCE COMMITTEE RECOMMENDATION:

The Drinking Water Board approve the updated Project Priority List.

October 7, 2014

Utah Federal SRF Program

Project Priority List

Total Unmet Needs: **$238,908,932** **Total Needs, incl. Recent funding** **$260,521,932** **Authorized** **$210,785,090**

	date	type	%Green	Priority Points	System Name	County	Pop.	ProjectTitle	Project Total	Request DWB	Funds Authorized
N				82.6	West Erda	Toole	158	Connect West Erda and Toele Airport to Erda Acres	$1,801,331.00	1801331	
N				22.5	White Hills Water	Utah	419	Waterline replacement, tank rehad, new PRV	$1,047,168	1,047,168	
N				18.5	Ticaboo Utility Imp Dist	Garfield	83	New well pump and pump house	$707,071	707,071	
N				18.4	Dutch John	Daggett	185	Tank repair, treatment upgrades, meters	$361,313	331,313	
A				75.8	Wooden Shoe Water Co.	Summit	76	Well, well house, tank	$202,424	$202,424	$201,000
A				50.0	Boulder Farmstead	Garfiled	226	Waterline, spring upgrades and chlorination	$2,000,000	$2,000,000	$2,000,000
A				47.4	Duchesne County	Duchesne	3,585	Supply line to 3 existing districts	$22,000,000	$4,000,000	$4,000,000
A				37.2	Gunnison	Sanpete	3,285	New well, Tank, Chlorination bldg, waterlines	$6,575,000	2,500,000	$2,500,000
A				20.5	Forest Glen A	Salt Lake	58	Spring redevelopment, tank, waterline replacement	$1,458,780	1,417,280	$1,418,000
A				13.7	Greendale	Daggett	500	New Water treatment system, 50,000 gal tank	$1,384,444	$1,144,444	$1,145,000
A				12.5	Bear River WCD- Collinston	Box Elder	50,104	1-MG tank, transmission line, pump station	$3,400,000	$3,300,000	$3,600,000
A				8.9	Herriman	Salt Lake	24,000	New 3 MG tank and pump station	$8,325,000	$5,000,000	$4,682,000
A				6.0	Sheep Creek HOA	Cache	75	New source and treatment	$90,000	$90,000	$90,000
A				3.4	Pleasant View	Weber	6,500	New well and reservoir	$2,326,263	$2,126,263	$1,977,000

N = **New Application**
A = **Authorized**
P = **Potential Project- no application**

E= **Energy Efficiency**
W= **Water Efficiency**
G= **Green Infrastructure**

I= **Environmentally Innovative**

GREEN PROJECTS

EMERGENCY FUNDING

N		100	Trenton Town	Cache	466	Spring Re-development	$401,150.00	$241,150
N		100	Mrble Hills	Box Elder	250	pump replacement	$152,167.00	$28,170

POTENTIAL PROJECTS

P				125.2	Soldier Summit SSD-2nd home sub	Utah	33	waterline upgrade	$530,303	$530,303	
P				36.4	Santa Clara (on hold)	Washington	8,000	Waterline upgrades	$6,419,202	$6,354,202	
P				35.0	CUWCD-Utah Valley	Utah		Treatment plant upgrades	$39,369,500	$36,950,000	

Utah Federal SRF Program

Project Priority List

October 7, 2014

Total Unmet Needs: **$238,908,932** **Total Needs, incl. Recent funding** **$260,521,932** **Authorized** **$210,785,090**

	date	type	%Green	Priority Points	System Name	County	Pop.	ProjectTitle	Project Total	Request DWB	Funds Authorized
P				24.4	Jordan Valley WCD	Salt Lake	82,500	Treatment	$3,200,000		
P				20.0	Pinon Forest	Duchesne	n/a	New system- residents haul water	$21,247,000		
P				17.9	Wendover	Tooele	1,600	Waterline upgrades	$833,000		
P				17.5	Draper City	Salt Lake	15,000	Storage and distribution upgrades	$35,789,000		
P				17.1	East Zion SSD	Kane	49	waterline	$128,876	$128,876	
P				16.4	Eastland SSD	San Juan	60	New well for back up purposes	$500,000		
P				16.4	Neola	Duchesne	840	Waterline upgrades, storage, source improvements	$3,607,592	$3,607,592	
P				15.3	Newton Town	Cache	799	Spring rehabilitation, waterline upgrades	$1,581,500		
P				15.3	South Rim Water	Tooele	264	Well equipment and house, new tank	$600,000		
P				15.2	Midvalley Estates Water Company	Iron	700	Source, storage, distribution	$500,000		
P				15.1	Syracuse	Davis	25,200	Waterline upgrades	$1,589,756	$1,589,756	
P				14.7	Central Waterworks Co.	Sevier	450	Storage and distribution upgrades	$1,400,000		
P				14.0	Herriman	Salt Lake	18,431	Booster Pump, waterline	$2,050,000		
P				13.7	Cornish Town	Cache	300	Connect to Lewiston, rehab well	$1,226,263		
P				13.7	Morgan City	Morgan	3,250	Waterline upgrades	$692,026		
P				13.5	Riverdale	Weber	8,200	New well and tank, waterline upgrades	$2,050,000		
P				13.3	Richfield City	Sevier	7,111	System repairs	$2,722,000		
P				13.0	Uintah City	Weber	1,300	Treatment	$1,063,000		
P				12.8	Centerfield	Sanpete	1,200	New tank, upgrade waterlines	$3,600,000		
P				12.6	Enterprise	Washington	1,500	New tank, upgrade waterlines	$1,917,100		
P				12.6	Price River	Carbon	7,659	New tank, waterlines, treatment	$2,750,000		
P				11.6	Manila Culinary Water Co.	Utah	2,450	Treatment and waterline upgrades	$700,000		
P				11.6	Jordan Valley WCD	Salt Lake	82,500	Flouride facility, well equipping	$3,694,000	$2,000,000	
P				11.4	Pineview West Water Company	Weber	115	Telemetry system	$25,000		
P				11.4	North Ogden City	Weber	15,000	Waterline upgrades	$746,000	$746,000	
P				11.3	Farmington	Davis	15,000	New well, new tank, waterline replacement	$2,830,000		
P				10.7	Ogden City	Weber	77,000	Source rehabilitation, treatment plant upgrades	$26,500,000		
P				10.7	High Valley Water Company	Summit	850	Waterline upgrades	$1,000,000		
P				10.3	City of Monticello	San Juan	2,000	Storage and distribution upgrades	$1,200,000		
P				9.8	Gorgoza	Summit	4,200	Waterline upgrades	$1,000,000		
P				9.7	Moutain Regional SSD	Summit	6,700	Transmission line	$600,000		
P				9.7	Benson Culinary Water District	Cache	743	New tank, waterline replacement	$500,000		
P				9.3	Mapleton City	Utah	7,300	Replace distribution lines	$15,339,560		
P				9.2	Greendale Water Co.	Daggett	500	Treatment system	$800,000		

October 7, 2014

Utah Federal SRF Program

Project Priority List

										Authorized
				Priority Points	**Total Unmet Needs:**	**$238,908,932**		**Total Needs, incl. Recent funding**	**$260,521,932**	**$210,785,090**
	date	type	%Green		System Name	County	Pop.	ProjectTitle	Project Total	Request DWB	Funds Authorized
P				**9.1**	Center Creek	Wasatch	200	Pump house and pump	$80,000		
P				**8.4**	Nibley City	Cache	4,300	New tank	$1,270,355		
P				**8.3**	Hurricane	Washington	8,000	Waterline replacement and new tank	$5,047,899		
P				**7.6**	Harmony Farms Water User Assoc.	Washington	300	Waterline Replacement	$3,000		
P				**6.8**	Hooper Water Improvement District	Weber	16,520	Storage, waterlines, treatment	$2,887,000		
P				**6.7**	Centerville City	Davis	16,000	Replacement well, waterline upgrades	$2,965,000		
P				**6.1**	Marble Hill Water Company	Box Elder	250	New storage tank	$225,000		
P				**4.5**	Peterson Pipeline Association	Morgan	450	Source, storage, distribution	$1,700,000		
P				**4.5**	Perry City	Box Elder	4,603	Source, storage, distribution	$4,782,220		
P				**3.9**	Wolf Creek Country Club	Weber	2,000	Waterline	$180,000		
P				**3.4**	Highland City	Utah	15,066	New well houses	$650,000		

Agenda Item 5(C)(i)(a)

Ticaboo Utility Improvement District
Presented to the Drinking Water Board
November 7, 2014

DRINKING WATER BOARD
BOARD PACKET FOR CONSTRUCTION LOAN

APPLICANT'S REQUEST:

Ticaboo Utility Improvement District is requesting financial assistance in the amount of $700,000 to replace the Well #1 pump and pump house.

STAFF COMMENTS:

The pumping equipment for the District's primary source, Well #1, has failed. The existing pump house has exceeded its useful life and is failing. The existing security fence is also old and requires replacement. The system presently uses diesel generators to provide the power required for the operation of the two existing wells. The dependence upon diesel power generation results in high pumping costs. The project also includes the installation of new solar panel arrays to provide power for Well #1 and Well #2 and reduce the reliance on diesel generation and associated high pumping costs.

The local MAGI for Ticaboo is $19,243 which is 49% of the State MAGI. They currently have a water bill of approximately $39.32 per month, which is 2.45% of local MAGI. Due to Ticaboo's low MAGI and high water bill relative it's MAGI the town qualifies for grant. A loan of $700,000 for 30 years with 20% grant or $140,000 would require the District to maintain an average water bill of $34.49, 2.15% of local MAGI. The District currently collects a surplus from water revenue.

FINANCIAL ASSISTANCE COMMITTEE RECOMMENDATION:

The Drinking Water Board authorize a loan of $560,000 at 0% interest for 30 years to the Ticaboo Utility Improvement District with $140,000 in grant.

APPLICANT'S LOCATION:

Ticaboo is located in Garfield County.

MAP OF APPLICANT'S LOCATION:

PROJECT DESCRIPTION:

The pumping equipment for the District's primary source, Well #1, has failed. The existing pump house has exceeded its useful life and is failing and the existing security fence is also old and requires replacement. The system presently uses diesel generators to provide the power required for the operation of the two existing wells. The dependence upon diesel power generation results in high pumping costs.

The project includes the following:

• Replacement of Well #1 pump and related equipment.
• Construction of a new pump house for Well #1.
• New fencing to secure Well #1 and the existing storage reservoir.
• Installation of new solar panel arrays to provide power for Well #1 and Well #2 and reduce the reliance on diesel generation and associated high pumping costs.

This project is designed to place this source back in reliable service, reduce pumping costs and satisfy state and federal regulatory requirements.

A solar engineering firm was consulted and provided with the District's kilowatt hour usage on the well pumps. From their analysis they recommended: 78.4 kW solar-direct for Well Pump 1; and 39.2 kW solar-direct for Well Pump 2. The solar-direct kW needed to power each pump was based upon historical usage values. This provides the District the ability to run the pumps solely on solar-direct power and keep up with demand even during night time hours when no pumping would occur. By doing so the District would no longer be reliant on diesel generation for water production though under an emergency situation the diesel generation can still be utilized. The District has estimated a return on investment for the solar construction in approximately 15 years.

POPULATION GROWTH:

According to the Utah State Governor's Office of Planning and Budgeting, the anticipated growth rate for Trenton Town Water System is approximately 1.1% per year over the next 40 years

	Year	Population
Current:	2014	134
Projected:	2030	180

IMPLEMENTATION SCHEDULE:

Apply to DWB for Construction Funds:	September 25, 2014
SRF Committee Conference Call:	October 15, 2014
DWB Funding Authorization:	November 7, 2014
Complete Design:	December 31, 2014
Plan Approval:	January 31, 2014
Advertise for Bids:	January 31, 2014
Bid Opening:	February 28, 2014
Loan Closing:	March 9, 2014
Begin Construction:	March 23, 2014
Complete Construction:	June 23, 2014
Receive Operating Permit:	July 23, 2014

COST ESTIMATE:

Legal and Bonding	$6,000
Engineering- Design	$25,000
Engineering- CMS	$10,000
Engineering- O&M Manual	$5,000
Construction-Water Source	$236,000
Construction- Solar Equipment	$358,000
Contingency	$60,000
Total Project Cost	**$700,000**

COST ALLOCATION:

The cost allocation proposed for the project is shown below.

Funding Source	Cost Sharing	Percent of Project
DWB Loan (0%, 30-yr)	$560,000	80%
DWB Grant	$140,000	20%
Total Amount	$700,000	100%

ESTIMATED ANNUAL COST OF WATER SERVICE:

Operation and Maintenance plus Depreciation: $27,578
Existing DW Debt Service: $0
DDW Debt Service (0%, 30-yrs): $18,666.67
DDW Debt Reserve: $1,866.67
Replacement Reserve Account: $2,800.00
Annual Cost/ERC: $413.91
Monthly Cost/ERC: $34.49
Cost as % MAGI: 2.15%

APPLICANT:	Ticaboo Utility Improvement District Highway 276, Mile Marker 27 P.O. Box 2140 Ticaboo, Utah 84533-8343 ticabooUID@gmail.com
PRESIDING OFFICIAL & CONTACT PERSON:	Chip Shortreed P.O. Box 2140 Ticaboo, Utah 84533 435-788-8343 435-459-1776 Mobile chipshortreed@msn.com
TREASURER/RECORDER:	Justin Fischer 435-788-8343
CONSULTING ENGINEER:	Ryan Jolley Jones & Demille Engineering, Inc. 1535 South 100 West Richfield, Utah 84701 435-896-8266 ryanj@jonesanddemille.com
FINANCIAL CONSULTANT:	Hinton Burdick 159 North Main Richfield, Utah 84701 435-896-5491
BOND ATTORNEY:	Baline Carlton Ballard Spahr Andrews & Ingersoll, LLP 201 South Main Street, One Utah Center, Suite 800 Salt Lake City, Utah 84111 801-531-3020

DRINKING WATER BOARD FINANCIAL ASSISTANCE EVALUATION

SYSTEM NAME: Ticaboo
COUNTY: Garfield
PROJECT DESCRIPTION: Well Construction

FUNDING SOURCE: State SRF

80 % Loan & 20 % Grant

ESTIMATED POPULATION:	134	NO. OF CONNECTIONS:	123 *	SYSTEM RATING:	APPROVED
CURRENT AVG WATER BILL:	$39.32 *			PROJECT TOTAL:	$700,000
CURRENT % OF AGI:	2.45%	FINANCIAL PTS:	64	LOAN AMOUNT:	$560,000
ESTIMATED MEDIAN AGI:	$19,243			GRANT AMOUNT:	$140,000
STATE AGI:	$39,325			TOTAL REQUEST:	$700,000
SYSTEM % OF STATE AGI:	49%				

	@ ZERO % RATE	@ RBBI MKT RATE		AFTER REPAYMENT PENALTY & POINTS
	0%	4.93%		0.00%
SYSTEM				
ASSUMED LENGTH OF DEBT, YRS:	30	30		30
ASSUMED NET EFFECTIVE INT. RATE:	0.00%	4.93%		0.00%
REQUIRED DEBT SERVICE:	$18,666.67	$36,138.64		$18,666.67
*PARTIAL COVERAGE (15%):	$2,800.00	$5,420.80		$2,800.00
*ADD. COVERAGE AND RESERVE (10%):	$1,866.67	$3,613.86		$1,866.67
ANNUAL NEW DEBT PER CONNECTION:	$189.70	$367.26		$189.70
O & M + FUNDED DEPRECIATION:	$27,578.00	$27,578.00		$27,578.00
OTHER DEBT + COVERAGE:	$0.00	$0.00		$0.00
REPLACEMENT RESERVE ACCOUNT:	$0.00	$0.00		$0.00
ANNUAL EXPENSES PER CONNECTION:	$224.21	$224.21		$224.21
TOTAL SYSTEM EXPENSES	$50,911.33	$72,751.30		$50,911.33
TAX REVENUE:	$0.00	$0.00		$0.00
RESIDENCE				
MONTHLY NEEDED WATER BILL:	$34.49	$49.29		$34.49
% OF ADJUSTED GROSS INCOME:	2.15%	3.07%		2.15%

* Equivalent Residential Connections

R309-700-5

Ticaboo
Garfield
October 1, 2014

TABLE 2
FINANCIAL CONSIDERATIONS

		POINTS	
1. COST EFFECTIVENESS RATIO (SELECT ONE)			
A. Project cost $0 to $500 per benefitting connection		16	
B. $501 to $1,500		14	
C. $1,501 to $2,000		11	
D. $2,001 to $3,000		8	
E. $3,001 to $5,000		4	
F. $5,001 to $10,000		1	X
G. Over $10,000		0	
	$5,691		
2. CURRENT LOCAL MEDIAN ADJUSTED GROSS INCOME (AGI) (SELECT ONE)			
A. Less than 70% of State Median AGI		19	X
B. 71 to 80% of State Median AGI		16	
C. 81 to 95% of State Median AGI		13	
D. 96 to 110% of State Median AGI		9	
E. 111 to 130% of State Median AGI		6	
E. 131 to 150% of State Median AGI		3	
F. Greater than 150% of State Median AGI		0	
	49%		
3. PROJECT FUNDING CONTRIBUTED BY APPLICANT (SELECT ONE)			
a. Greater than 25% of project funds		17	
b. 15 to 25% of project funds		14	
c. 10 to 15% of project funds		11	
c. 5 to 10% of project funds		8	
d. 2 to 5% of project funds		4	
e. Less than 2% of project funds		0	X
	0.0%		
4. ABILITY TO REPAY LOAN			
4. WATER BILL (INCLUDING TAXES) AFTER PROJECT IS BUILT RELATIVE TO LOCAL MEDIAN ADJUSTED GROSS INCOME (SELECT ONE)			
a. Greater than 2.50% of local median AGI		16	
b. 2.01 to 2.50% of local median AGI		12	X
c. 1.51 to 2.00% of local median AGI		8	
d. 1.01 to 1.50% of local median AGI		3	
e. 0 to 1.00% of local median AGI		0	
	2.15%		
5. SPECIAL INCENTIVE POINTS Applicant: (Mark all that apply)			
A. has a replacement fund receiving annual deposits of 5% of the system's drinking water budget been established, and has already accumulated a minimum of 10% of said annual DW budget in this reserve fund.		5	X
B. Has a replacement fund equal to at least 15% or 20% of annual DW budget.		5	X
C. Is creating or enhancing a regionalization plan		16	X
D. Has a rate structure encouraging conservation		6	X
TOTAL POINTS FOR FINANCIAL NEED		64	
TOTAL POSSIBLE POINTS FOR FINANCIAL NEED		100	

Ticaboo

PROPOSED BOND REPAYMENT SCHEDULE

80 % Loan & 20 % Grant

PRINCIPAL	$560,000.00	ANTICIPATED CLOSING DATE	09-Mar-15
INTEREST	0.00%	FIRST P&I PAYMENT DUE	01-Jul-16
TERM	30	REVENUE BOND	
NOMIN. PAYMENT	$18,666.67	PRINC PREPAID:	$0.00

YEAR	BEGINNING BALANCE	DATE OF PAYMENT	PAYMENT		PRINCIPAL	INTEREST	ENDING BALANCE	PAYM NO.
2015	$560,000.00		$0.00	*	$0.00	$0.00	$560,000.00	0
2016	$560,000.00		$19,000.00		$19,000.00	$0.00	$541,000.00	1
2017	$541,000.00		$19,000.00		$19,000.00	$0.00	$522,000.00	2
2018	$522,000.00		$19,000.00		$19,000.00	$0.00	$503,000.00	3
2019	$503,000.00		$19,000.00		$19,000.00	$0.00	$484,000.00	4
2020	$484,000.00		$19,000.00		$19,000.00	$0.00	$465,000.00	5
2021	$465,000.00		$19,000.00		$19,000.00	$0.00	$446,000.00	6
2022	$446,000.00		$19,000.00		$19,000.00	$0.00	$427,000.00	7
2023	$427,000.00		$19,000.00		$19,000.00	$0.00	$408,000.00	8
2024	$408,000.00		$19,000.00		$19,000.00	$0.00	$389,000.00	9
2025	$389,000.00		$19,000.00		$19,000.00	$0.00	$370,000.00	10
2026	$370,000.00		$19,000.00		$19,000.00	$0.00	$351,000.00	11
2027	$351,000.00		$18,000.00		$18,000.00	$0.00	$333,000.00	12
2028	$333,000.00		$19,000.00		$19,000.00	$0.00	$314,000.00	13
2029	$314,000.00		$18,000.00		$18,000.00	$0.00	$296,000.00	14
2030	$296,000.00		$19,000.00		$19,000.00	$0.00	$277,000.00	15
2031	$277,000.00		$18,000.00		$18,000.00	$0.00	$259,000.00	16
2032	$259,000.00		$19,000.00		$19,000.00	$0.00	$240,000.00	17
2033	$240,000.00		$18,000.00		$18,000.00	$0.00	$222,000.00	18
2034	$222,000.00		$19,000.00		$19,000.00	$0.00	$203,000.00	19
2035	$203,000.00		$18,000.00		$18,000.00	$0.00	$185,000.00	20
2036	$185,000.00		$19,000.00		$19,000.00	$0.00	$166,000.00	21
2037	$166,000.00		$18,000.00		$18,000.00	$0.00	$148,000.00	22
2038	$148,000.00		$19,000.00		$19,000.00	$0.00	$129,000.00	23
2039	$129,000.00		$18,000.00		$18,000.00	$0.00	$111,000.00	24
2040	$111,000.00		$19,000.00		$19,000.00	$0.00	$92,000.00	25
2041	$92,000.00		$18,000.00		$18,000.00	$0.00	$74,000.00	26
2042	$74,000.00		$19,000.00		$19,000.00	$0.00	$55,000.00	27
2043	$55,000.00		$18,000.00		$18,000.00	$0.00	$37,000.00	28
2044	$37,000.00		$19,000.00		$19,000.00	$0.00	$18,000.00	29
2045	$18,000.00		$18,000.00		$18,000.00	$0.00	$0.00	30
			$560,000.00		$560,000.00	$0.00		

*Interest Only Payment

Ticaboo

DWB Loan Terms		
Local Share (total):	$	-
Other Agency Funding:	$	-
DWB Grant Amount:	$	140,000
DWB Loan Amount:	$	560,000
DWB Loan Term:		30
DWB Loan Interest:		**0.00%**
DWB Loan Payment:	$	18,667

DW Expenses (Estimated)		
Proposed Facility Capital Cost:		#VALUE!
Existing Facility O&M Expense:	$	27,578
Proposed Facility O&M Expense:	$	27,578
O&M Inflation Factor:		**1.0%**
Existing Debt Service:	$	-

DW Revenue Sources (Projected)		
Beginning Cash:	$	-
Existing Customers (ERC):		123
Projected Growth Rate:		**1.0%**
Impact Fee/Connection Fee:	$	3,500
Current Monthly User Charge:	$	39.32
Needed Average Monthly User Charge:	$	34.49

DW Revenue Projections

Yr	Growth Rate (%)	Annual Growth (ERC)	Total Users (ERC)	User Charge Revenue	Impact Fee Revenue	Property Tax Revenue	Total Revenue	DWB Loan Repayment	DWB Loan Reserves	Remaining Principal	Principal Payment	Interest Payment	Existing DW Debt Service	O&M Expenses	Total Expenses	Debt Service Ratio
0	1.0%	1	123	58,032	3,500	-	61,532	**-**	**-**	560,000	-	-	-	27,578	27,578	-
1	1.0%	1	124	51,325	3,500	-	54,825	**19,000**	**1,867**	541,000	19,000	-	-	27,578	48,445	1.43
2	1.0%	1	125	51,739	3,500	-	55,239	**19,000**	**1,867**	522,000	19,000	-	-	27,854	48,720	1.44
3	1.0%	2	127	52,567	7,000	-	59,567	**19,000**	**1,867**	503,000	19,000	-	-	28,132	48,999	1.65
4	1.0%	1	128	52,981	3,500	-	56,481	**19,000**	**1,867**	484,000	19,000	-	-	28,414	49,280	1.48
5	1.0%	1	129	53,395	3,500	-	56,895	**19,000**	**1,867**	465,000	19,000	-	-	28,698	49,564	1.48
6	1.0%	2	131	54,223	7,000	-	61,223	**19,000**	**1,867**	446,000	19,000	-	-	28,985	49,851	1.70
7	1.0%	1	132	54,637	3,500	-	58,137	**19,000**	**1,867**	427,000	19,000	-	-	29,275	50,141	1.52
8	1.0%	1	133	55,050	3,500	-	58,550	**19,000**	**1,867**	408,000	19,000	-	-	29,567	50,434	1.53
9	1.0%	2	135	55,878	7,000	-	62,878	**19,000**	**1,867**	389,000	19,000	-	-	29,863	50,730	1.74
10	1.0%	1	136	56,292	3,500	-	59,792	**19,000**	**1,867**	370,000	19,000	-	-	30,162	51,028	1.56
11	1.0%	1	137	56,706	3,500	-	60,206	**19,000**		351,000	19,000	-	-	30,463	49,463	1.57
12	1.0%	2	139	57,534	7,000	-	64,534	**18,000**		333,000	18,000	-	-	30,768	48,768	1.88
13	1.0%	1	140	57,948	3,500	-	61,448	**19,000**		314,000	19,000	-	-	31,076	50,076	1.60
14	1.0%	1	141	58,362	3,500	-	61,862	**18,000**		296,000	18,000	-	-	31,386	49,386	1.69
15	1.0%	2	143	59,190	7,000	-	66,190	**19,000**		277,000	19,000	-	-	31,700	50,700	1.82
16	1.0%	1	144	59,604	3,500	-	63,104	**18,000**		259,000	18,000	-	-	32,017	50,017	1.73
17	1.0%	2	146	60,431	7,000	-	67,431	**19,000**		240,000	19,000	-	-	32,337	51,337	1.85
18	1.0%	1	147	60,845	3,500	-	64,345	**18,000**		222,000	18,000	-	-	32,661	50,661	1.76
19	1.0%	2	149	61,673	7,000	-	68,673	**19,000**		203,000	19,000	-	-	32,987	51,987	1.88
20	1.0%	1	150	62,087	3,500	-	65,587	**18,000**		185,000	18,000	-	-	33,317	51,317	1.79
21	1.0%	2	152	62,915	7,000	-	69,915	**19,000**		166,000	19,000	-	-	33,650	52,650	1.91
22	1.0%	1	153	63,329	3,500	-	66,829	**18,000**		148,000	18,000	-	-	33,987	51,987	1.82
23	1.0%	2	155	64,157	7,000	-	71,157	**19,000**		129,000	19,000	-	-	34,327	53,327	1.94
24	1.0%	1	156	64,570	3,500	-	68,070	**18,000**		111,000	18,000	-	-	34,670	52,670	1.86
25	1.0%	2	158	65,398	7,000	-	72,398	**19,000**		92,000	19,000	-	-	35,017	54,017	1.97
26	1.0%	1	159	65,812	3,500	-	69,312	**18,000**		74,000	18,000	-	-	35,367	53,367	1.89
27	1.0%	2	161	66,640	7,000	-	73,640	**19,000**		55,000	19,000	-	-	35,721	54,721	2.00
28	1.0%	2	163	67,468	7,000	-	74,468	**18,000**		37,000	18,000	-	-	36,078	54,078	2.13
29	1.0%	1	164	67,882	3,500	-	71,382	**19,000**		18,000	19,000	-	-	36,439	55,439	1.84
30	1.0%	2	166	68,710	7,000	-	75,710	**18,000**		-	18,000	-	-	36,803	54,803	2.16
									Total Paid in Debt Service =		560,000	-				

Utah Department of Environmental Quality

Division of Drinking Water

Public Water System Master Report

Run Date:
10/08/2014 01:21 pm

PWS ID: UTAH09022 ***Name:*** TICABOO UTILITY IMPROVEMENT DISTRICT

Legal Contact TICABOO TOWN
WILLIAM JOHN SHORTREED JR

Address: PO BOX 2140
TICABOO, UT 84533

Phone Number: 435-788-8343

City Served (Area):

County: GARFIELD COUNTY

Rating: Approved

Rating Date: 04/09/1996

Activity Status: A

Consumptive Use Zone

Irrigation Zone Number: 5 02/15/2013

System Type: Community

Population: 83

Last Inv Update: 04/08/2014

Last Snty Srv Dt: 11/06/2012

Surveyor: GARY MICAH KOBZEF

Oper Period: 1/1 to 12/31

Contacts

Contact Type	Name	Title	Phone Numbers Office	Emergency	Email Address
AC	SHORTREED JR, WILLIAM JOHN		435-788-8343	435-788-2020	CHIPSHORTREED@MSN.C

Service Connections

Connection Type	Meter Type Code	Meter Size	Number Connections	
Residential	Metered	0	91	
Agricultural	Unknown	0	2	
Commercial	Unknown	0	5	
			98	**Total Svc Connections**

Storage

Total Storage: 500,000 GAL ***Number of Units:*** 1

No.	Name	Type	Effective Volume	Constr Matrl	Activity Status	Activity Status Reason	Press'd
ST001	TANK #1	Ground	500,000 GAL	Concrete	A		

Sources

No.	Source Name	Activity Status	Activity Status Reason	Source Type	Safe Yield *	Pump Capacity	Location Data On File	Water Type	Availability	Period of Operation
WS001	WELL #1	Active		WL	150 GPM	150 GPM	Yes	GW	Permanent	1/1 to 12/31
WS002	WELL #2	Active		WL	47 GPM	70 GPM	Yes	GW	Permanent	1/1 to 12/31

**Reports measured flow for wells, approved design capacity for all other sources.*

Sampling and Monitoring Requirements

Total Coliform Rule Monitoring

Sample Count	Sample Type	Sample Frequency	Effective Begin Date	Effective End Date	Seasonal Start	Seasonal End	Analyte Code	Analyte Name
1	Routine	Monthly	08/01/2014		1/1	12/31	3100	COLIFORM (TCR)

Additional Monitoring Requirements

Facility ID	Facility Name / Analyte Name	Sample Count	Sample Type	Sample Frequency	Last Sample	Next Sample Between
DS001	UTAH09022 DISTRIBUTION SYSTEM		Activity Status: A	Sample Label: UTAH09022 DS001		
	Lead & Copper	5	Routine	3 Years	2012	06/01-09/30 2015
WS001	WELL #1		Activity Status: A	Sample Label: UTAH09022 WS001 WS001		
	NITRATE	1	Routine	Year	09/26/2013	01/01/2014-12/31/2014
	Radionuclides	1	Routine	6 Years		01/01/2011-12/31/2016
	Volatile Organics	1	Routine	3 Years	07/25/2013	01/01/2014-12/31/2016
	Inorg & Metals	1	Routine	3 Years	05/08/2013	01/01/2014-12/31/2016
	Sodium, Sulfate, TDS	1	Routine	3 Years	05/08/2013	01/01/2014-12/31/2016
	Pesticides	1	Routine	3 Years	07/25/2013	01/01/2014-12/31/2016
WS002	WELL #2		Activity Status: A	Sample Label: UTAH09022 WS002		
	NITRATE	1	Routine	Year	08/26/2014	01/01/2015-12/31/2015
	Inorg & Metals	1	Routine	3 Years	09/26/2013	01/01/2014-12/31/2016
	Sodium, Sulfate, TDS	1	Routine	3 Years	09/26/2013	01/01/2014-12/31/2016
	Pesticides	1	Routine	3 Years	10/29/2013	01/01/2014-12/31/2016
	Volatile Organics	1	Routine	Year	11/19/2013	01/01/2014-12/31/2014
	Radionuclides	1	Routine	6 Years	09/26/2013	01/01/2017-12/31/2022

Improvement Priority System

Total IPS Points: **1** **Rating Date:** 04/09/1996 **Rating:** **Approved**

Admin & Physical Facilities:	1
*** Qualtiy & Monitoring Violations:**	0
Operator Certification:	0

* Total Admin & Physical Facilities demerit points may not agree with the detail section. The detail section shows all 'open' physical deficiencies; the Total Admin & Physical Facilities value adjusts for duplicate deficiencies

Physical Facility, Administrative, & Source Protection Deficiencies from Site Visits

Facility	Activity Status	Severity	Date Determined	Point Not Effective	Point Effective
Code **Description**					
S015 WELL LACKS A MEANS TO MEASURE DRAWDOWN					
		MIN	11/16/2006		1

Total Admin & Physical Faciity Deficiency **1**

Operator Certification Points

	Distribution	*Treatment*
Level Required	**SS**	
Highest Certificate on Record	**SS**	
Points	**0**	**0**

Total Points **0**

Certified Operators

License Number	Operator Name	Address	CEU's	Cert Grade	Expiration
141153	BELL, WILLIAM D	PO BOX 2174; TICABOO, UT 84533			
				SS	12/31/2017
25050	DEFFERT, ERNST J	**MOVED**; TICABOO, UT 84533-2224			
				SS	12/31/2008
25051	DEFFERT, JOSEPH F	4855 W LAKERIDGE RD; DENVER, CO 80219-5628			
				SS	12/31/2008
07106	RANDALL, WILFORD KAY	PO BOX 2275; LAKE POWELL, UT 84533			
				SS	12/31/2013
12827	SHORTREED JR, WILLIAM JOHN	PO BOX 2172; TICABOO, UT 84533			
			2.4	SS	12/31/2015
12817	WEIL, JOHN B	PO BOX 2138; TICABOO, UT 84533			
			2.4	SS	12/31/2015

Compliance Schedules

Type	Required Activities	Severity	Date Created	Due Date	Achieved Date
Complete Lead Copper Notice	Submit Lead/Copper Certification Notice to DDW		06/01/2012	12/29/2012	

Total Coliform Sample History

For the 13 Months Beginning 10/01/2013

		TCR Routine Samples			TCR Repeat Samples			Source Samples		
		No Samp	TC Pos.	Ecoli Pos.	No Samp	TC Pos.	Ecoli. Pos.	No Samp	TC Pos	Ecoli Pos.
Oct	2013	1	0	0	0	0	0	0	0	0
Nov	2013	1	0	0	0	0	0	0	0	0
Dec	2013	1	0	0	0	0	0	0	0	0
Jan	2014	1	0	0	0	0	0	0	0	0
Feb	2014	1	0	0	0	0	0	0	0	0
Mar	2014	1	0	0	0	0	0	0	0	0
Apr	2014	1	0	0	0	0	0	0	0	0
May	2014	1	0	0	0	0	0	0	0	0
Jun	2014	1	0	0	0	0	0	0	0	0
Jul	2014	1	0	0	0	0	0	0	0	0
Aug	2014	1	0	0	0	0	0	0	0	0
Sep	2014	0	0	0	0	0	0	0	0	0
Oct	2014	0	0	0	0	0	0	0	0	0

Last sample taken 08/26/2014 from UT00027 CHEMTECH/FORD CHEMICAL LAB

Agenda Item 5(C)(ii)(a)

Central Iron County Water Conservancy District
Presented to the Drinking Water Board
November 7, 2014

DRINKING WATER BOARD
BOARD PACKET FOR AQUIFER BALANCE STUDY

APPLICANT'S REQUEST:

Central Iron County Water Conservancy District is requesting funding in the amount of $100,000 to conduct an aquifer balance study. The cost of the study will be $200,000 and they will contribute $100,000 toward the study.

STAFF COMMENTS:

The aquifer balance project is a result of the declining water levels in the aquifer near the Quichapa well field that supplies the majority of the water for Cedar City. There has also been a mounding of water in the north end of the Cedar basin. They plan to drill test wells and conduct test pumping in order to determine the appropriate locations to develop additional sources to provide water to Cedar City. Having this new source of water would allow them to idle their pumping in the Quichapa well field area and hopefully reduce the fissures and subsidence that is being documented in that area. This project will provide a better management of their current aquifer and prevent further damage to the aquifer's integrity.

The local MAGI, based on the zip code for the area served by Central Iron County Water Conservancy District, is $30,540, which is approximately 78% of the State's MAGI. Their current water bill is approximately $107 per month, which is 4.2% of their MAGI. This water bill includes a portion of their property tax ($83/month/ERC) that goes to the District. A planning loan at 0% interest for 5 years would result in a water bill of $114 per month, which is 4.49% of their MAGI. The District qualifies to be considered for a planning grant.

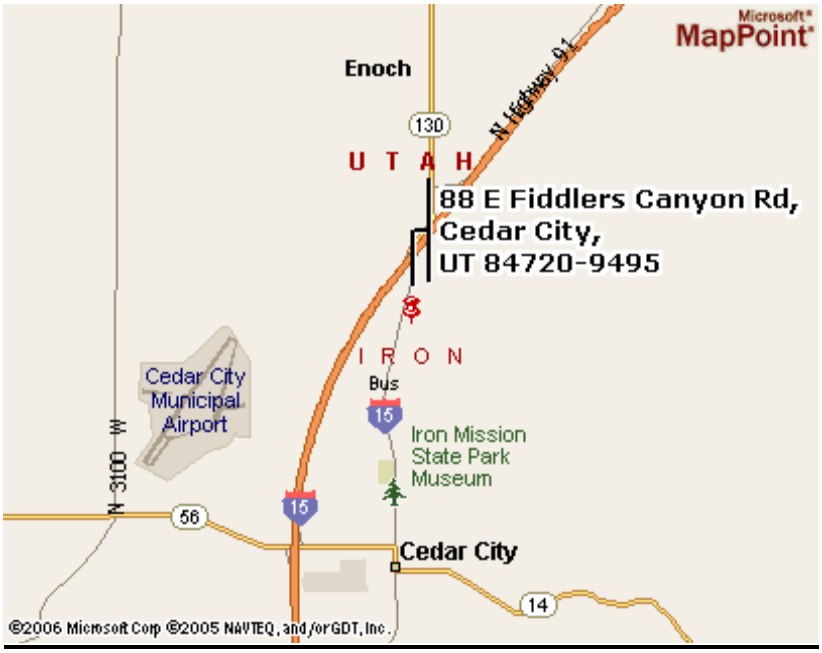
FINANCIAL ASSISTANCE COMMITTEE RECOMMENDATION:

The Drinking Water Board authorize a $100,000 planning loan at 0% interest for 5 years with $50,000 in principal forgiveness to Central Iron County Water Conservancy District.

APPLICANT'S LOCATION:

Central Iron County Water Conservancy District is located in Iron County.

MAP OF APPLICANT'S LOCATION:



PLANNING DESCRIPTION/SCOPE OF WORK:

The aquifer balance project will involve drilling test wells and conducting test pumping in order to determine the appropriate locations to develop additional sources to provide to Cedar City. Having this new source of water would allow them to idle their pumping in the Quichapa well field area, which has been experiencing a decline in water level, and hopefully reduce the fissures and subsidence that is being documented in that area.

POPULATION GROWTH:

According to the Governor's Office of Planning and Budget, Iron County is estimated to grow at an annual average rate of change of approximately 2.6% through the year 2060.

	Year	Population
Current:	2010	50,601
Projected:	2060	168,383

IMPLEMENTATION SCHEDULE:

Apply to DWB for Planning Funds:	September 2014
Division Funding Authorization:	November 2014
Completion of Planning Study:	May 2015

COST ESTIMATE:

Engineering Study:	$200,000
Total Planning Cost:	$200,000

COST ALLOCATION:

The cost allocation proposed for the project is shown below.

Funding Source	Cost Sharing	Percent of Project
DWB Grant:	$50,000	25%
DWB Loan (0%, 5 years)	$50,000	25%
System Contribution	$100,000	50%
Total Amount:	$200,000	100%

APPLICANT:	Central Iron County Water Conservancy District 88 East Fiddlers Canyons Road, Suite A Cedar City, Utah 84720 Telephone: (435) 865-9901 Fax: (435) 865-9902
PRESIDING OFFICIAL & CONTACT PERSON:	Paul Monroe, Executive Director 88 East Fiddlers Canyons Road, Suite A Cedar City, Utah 84720 Telephone: (435) 865-9901 Fax: (435) 865-9902 Email: p.monroe@xcicwcd.org
CONSULTING ENGINEER:	Kelly Crane, P.E. Ensign Engineering 870 North Main Street Suite 102 Cedar City, Utah 84721 Telephone: (435) 590-0187 Fax: (435) 865-7318 Email: kelly.crane@ensignutah.com

DRINKING WATER BOARD FINANCIAL ASSISTANCE EVALUATION

SYSTEM NAME: Central Iron County
COUNTY: Iron
PROJECT DESCRIPTION: Aquifer balance study

FUNDING SOURCE: Federal SRF

50 % Loan & 50 % P.F.

ESTIMATED POPULATION:	2,100	NO. OF CONNECTIONS:	1775 *	SYSTEM RATING:	APPROVED
CURRENT AVG WATER BILL:	$106.83 *			PROJECT TOTAL:	$201,000
CURRENT % OF AGI:	4.20%	FINANCIAL PTS:	97	LOAN AMOUNT:	$50,000
ESTIMATED MEDIAN AGI:	$30,540			PRINC. FORGIVENESS:	$50,000
STATE AGI:	$39,325			TOTAL REQUEST:	$100,000
SYSTEM % OF STATE AGI:	78%				

	@ ZERO % RATE	@ RBBI MKT RATE		AFTER REPAYMENT PENALTY & POINTS
	0%	4.76%		0.00%
SYSTEM				
ASSUMED LENGTH OF DEBT, YRS:	5	5		5
ASSUMED NET EFFECTIVE INT. RATE:	0.00%	4.76%		0.00%
REQUIRED DEBT SERVICE:	$10,000.00	$11,472.23		$10,000.00
*PARTIAL COVERAGE (15%):	$0.00	$0.00		$0.00
*ADD. COVERAGE AND RESERVE (10%):	$1,000.00	$1,147.22		$1,000.00
ANNUAL NEW DEBT PER CONNECTION:	$6.20	$7.11		$6.20
O & M + FUNDED DEPRECIATION:	$1,109,164.00	$1,109,164.00		$1,109,164.00
OTHER DEBT + COVERAGE:	$1,197,303.75	$1,197,303.75		$1,197,303.75
REPLACEMENT RESERVE ACCOUNT:	$103,850.35	$103,923.96		$103,850.35
ANNUAL EXPENSES PER CONNECTION:	$1,357.93	$1,357.97		$1,357.93
TOTAL SYSTEM EXPENSES	$2,421,318.10	$2,423,011.16		$2,421,318.10
TAX REVENUE:	$1,761,030.00	$1,761,030.00		$1,761,030.00
RESIDENCE				
MONTHLY NEEDED WATER BILL:	$196.35	$196.43		$113.68
% OF ADJUSTED GROSS INCOME:	7.72%	7.72%		4.47%

* Equivalent Residential Connections

R309-700-5

Central Iron County
Iron
September 25, 2014

TABLE 2
FINANCIAL CONSIDERATIONS

		POINTS	
1. COST EFFECTIVENESS RATIO (SELECT ONE)			
A. Project cost $0 to $500 per benefitting connection		16	X
B. $501 to $1,500		14	
C. $1,501 to $2,000		11	
D. $2,001 to $3,000		8	
E. $3,001 to $5,000		4	
F. $5,001 to $10,000		1	
G. Over $10,000		0	
	$113		
2. CURRENT LOCAL MEDIAN ADJUSTED GROSS INCOME (AGI) (SELECT ONE)			
A. Less than 70% of State Median AGI		19	
B. 71 to 80% of State Median AGI		16	X
C. 81 to 95% of State Median AGI		13	
D. 96 to 110% of State Median AGI		9	
E. 111 to 130% of State Median AGI		6	
E. 131 to 150% of State Median AGI		3	
F. Greater than 150% of State Median AGI		0	
	78%		
3. PROJECT FUNDING CONTRIBUTED BY APPLICANT (SELECT ONE)			
a. Greater than 25% of project funds		17	X
b. 15 to 25% of project funds		14	
c. 10 to 15% of project funds		11	
c. 5 to 10% of project funds		8	
d. 2 to 5% of project funds		4	
e. Less than 2% of project funds		0	
	50.2%		
4. ABILITY TO REPAY LOAN			
4. WATER BILL (INCLUDING TAXES) AFTER PROJECT IS BUILT RELATIVE TO LOCAL MEDIAN ADJUSTED GROSS INCOME (SELECT ONE)			
a. Greater than 2.50% of local median AGI		16	X
b. 2.01 to 2.50% of local median AGI		12	
c. 1.51 to 2.00% of local median AGI		8	
d. 1.01 to 1.50% of local median AGI		3	
e. 0 to 1.00% of local median AGI		0	
	4.47%		
5. SPECIAL INCENTIVE POINTS Applicant: (Mark all that apply)			
A. has a replacement fund receiving annual deposits of 5% of the system's drinking water budget been established, and has already accumulated a minimum of 10% of said annual DW budget in this reserve fund.		5	X
B. Has a replacement fund equal to at least 15% or 20% of annual DW budget.		5	X
C. Is creating or enhancing a regionalization plan		16	X
D. Has a rate structure encouraging conservation		6	X
TOTAL POINTS FOR FINANCIAL NEED		97	
TOTAL POSSIBLE POINTS FOR FINANCIAL NEED		100	

Central Iron County

PROPOSED BOND REPAYMENT SCHEDULE

50 % Loan & 50 % P.F.

PRINCIPAL	$50,000.00	ANTICIPATED CLOSING DATE	15-Aug-14
INTEREST	0.00%	FIRST P&I PAYMENT DUE	15-May-16
TERM	5	REVENUE BOND	
NOMIN. PAYMENT	$10,000.00	PRINC PREPAID:	$0.00

YEAR	BEGINNING BALANCE	DATE OF PAYMENT	PAYMENT		PRINCIPAL	INTEREST	ENDING BALANCE	PAYM NO.
2015	$50,000.00		$0.00	*	$0.00	$0.00	$50,000.00	0
2016	$50,000.00		$10,000.00		$10,000.00	$0.00	$40,000.00	1
2017	$40,000.00		$10,000.00		$10,000.00	$0.00	$30,000.00	2
2018	$30,000.00		$10,000.00		$10,000.00	$0.00	$20,000.00	3
2019	$20,000.00		$10,000.00		$10,000.00	$0.00	$10,000.00	4
2020	$10,000.00		$10,000.00		$10,000.00	$0.00	$0.00	5
			$50,000.00		$50,000.00	$0.00		

*Interest Only Payment

Central Iron County

DWB Loan Terms		
Local Share (total):	$	101,000
Other Agency Funding:	$	-
DWB Grant Amount:	$	50,000
DWB Loan Amount:	$	50,000
DWB Loan Term:		5
DWB Loan Interest:		**0.00%**
DWB Loan Payment:	$	10,000

DW Expenses (Estimated)		
Proposed Facility Capital Cost:	$	201,000
Existing Facility O&M Expense:	$	999,164
Proposed Facility O&M Expense:	$	999,164
O&M Inflation Factor:		**1.0%**
Existing Debt Service:	$	957,843

DW Revenue Sources (Projected)		
Beginning Cash:	$	-
Existing Customers (ERC):		1,775
Projected Growth Rate:		**1.0%**
Impact Fee/Connection Fee:	$	2,500
Current Monthly User Charge:	$	106.83
Needed Average Monthly User Charge:	$	113.68

DW Revenue Projections

Yr	Growth Rate (%)	Annual Growth (ERC)	Total Users (ERC)	User Charge Revenue	Impact Fee Revenue	Property Tax Revenue	Total Revenue	DWB Loan Repayment	DWB Loan Reserves	Remaining Principal	Principal Payment	Interest Payment	Existing DW Debt Service	O&M Expenses	Total Expenses	Debt Service Ratio
0	1.0%	18	1,775	2,275,543	45,000	1,761,030	4,081,573	**-**	**-**	50,000	-	-	957,843	999,164	1,957,007	-
1	1.0%	18	1,793	2,445,872	45,000	1,761,030	4,251,902	**10,000**	**1,000**	40,000	10,000	-	957,843	999,164	1,968,007	3.36
2	1.0%	18	1,811	2,470,427	45,000	1,761,030	4,276,457	**10,000**	**1,000**	30,000	10,000	-	957,843	1,009,156	1,977,999	3.38
3	1.0%	18	1,829	2,494,981	45,000	1,761,030	4,301,011	**10,000**	**1,000**	20,000	10,000	-	957,843	1,019,247	1,988,090	3.39
4	1.0%	18	1,847	2,519,535	45,000	1,761,030	4,325,565	**10,000**	**1,000**	10,000	10,000	-	957,843	1,029,440	1,998,283	3.41
5	1.0%	19	1,866	2,545,453	47,500	1,761,030	4,353,983	**10,000**	**1,000**	-	10,000	-	957,843	1,039,734	2,008,577	3.42
									Total Paid in Debt Service =		50,000	-				

Agenda Item 5(C)(ii)(b)

Dagget County - Dutch John
Presented to the Drinking Water Board
November 7, 2014

DRINKING WATER BOARD
BOARD PACKET FOR CONSTRUCTION LOAN

APPLICANT'S REQUEST:

Daggett County is requesting a total of $362,000 in financial assistance to repair two storage tanks, upgrade the disinfection system in the water treatment plant, replace filter media, and add meters within the Dutch John system. The total project cost is the requested amount. Dutch John scored 18.4 points on the project priority list.

STAFF COMMENTS:

The local MAGI for Dutch John is $43,604, which is 111% of the state MAGI of $39,625. The current average water bill is estimated at $56.01, which is 1.54% of their MAGI. However, with the proposed funding package, the water rates would need to increase to $75.78, or 2.09% of the MAGI, which would qualify Dutch John for additional subsidization. Staff looked at four (4) funding options which are summarized in the table below:

Loan	P.F.	Interest	Water Bill	% MAGI
$362,000	-----	3.44%	$75.78	2.09%
$288,000	$74,000	3.44%	$73.10	2.01%
$288,000	$74,000	1.72%	$70.98	1.95%
$288,000	$74,000	0.0%	$69.12	1.9%

Dutch John (Daggett County) has an existing loan with the Drinking Water Board. Due to funding from the Bureau of Reclamation, Daggett paid off a higher amount of principal on the first three years of the loan at around $25,000. Now, their annual payments have dropped to around $8,600 on average.

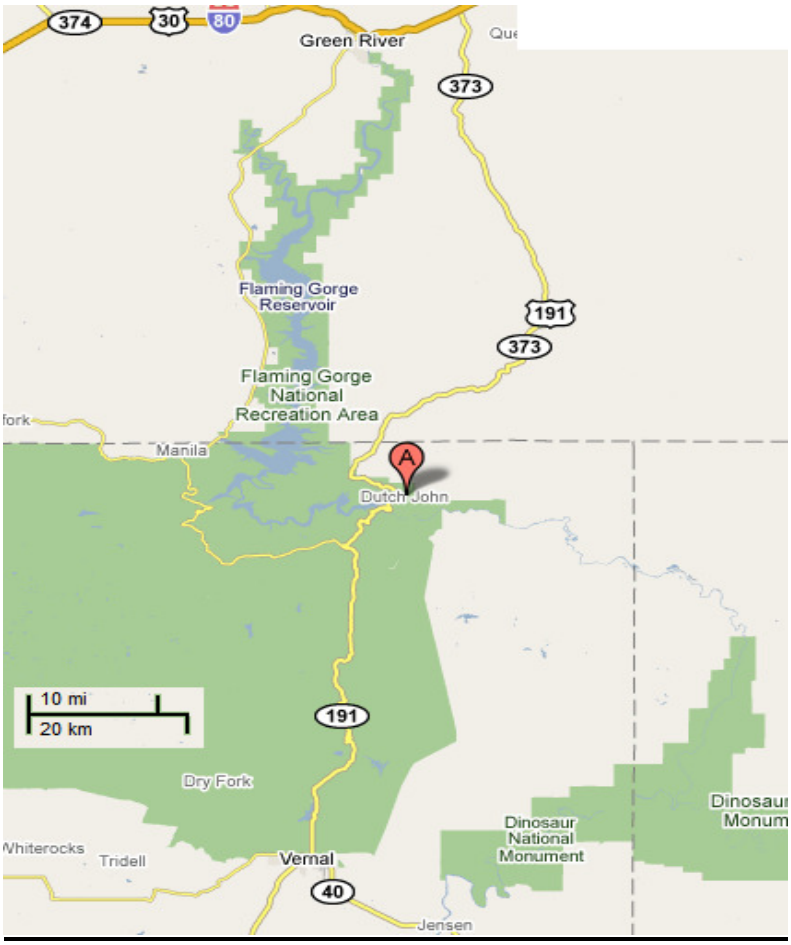
FINANCIAL ASSISTANCE COMMITTEE RECOMMENDATION:

The Drinking Water Board authorize a $288,000 loan at 1.72% interest for 30 years with $74,000 in principal forgiveness to Daggett County - Dutch John.

APPLICANT'S LOCATION:

The Dutch John Water System is located in Daggett County, approximately 40 miles north of Vernal.

MAP OF APPLICANT'S LOCATION:



PROJECT DESCRIPTION:

The Dutch John Water System will repair two storage tanks, upgrade the disinfection system in the water treatment plant, replace filter media, and add meters within the system.

POPULATION GROWTH:

According to the Governor's Office of Planning and Budget the Dutch John Water System service area is expected to grow at an average annual rate of change of approximately 1% through 2030.

	Year	Population	ERC's
Current	2009	260	120
Projected	2030	324	162

IMPLEMENTATION SCHEDULE:

Apply to DWB for Funding:	September 2014
DWB Funding Authorization:	November 2014
Plans Submitted:	December 2014
Plan Approval:	January 2015
Advertise for Bids:	January 2015
Loan Closing:	January 2015
Begin Construction:	February 2015
Complete Construction:	May 2015

COST ESTIMATE:

Construction:	$255,000
Engineering:	$64,000
Contingency:	$35,000
Admin/Legal/Bonding:	$8,000
Total Capital Cost:	$362,000

ESTIMATED ANNUAL COST OF WATER SERVICE:

Operation & Maintenance:	$91,677.00
DDW Debt Service (3.44%, 30 yrs):	$19,534.74
DDW 10% Coverage:	$1,953.47
Total Annual Cost / ERU:	$759.07
Monthly Cost / ERU:	$75.78
Cost as % of MAGI:	2.09%

CONTACT INFORMATION:

APPLICANT:	Dutch John Water System PO Box 219 Manila, UT 84046 435-784-3154
PRESIDING OFFICIAL & CONTACT PERSON:	Warren Blanchard, County Commissioner 95 N 1st West Manila, UT 84046 435-503-4151 wblanchard@daggettcounty.org
TREASURER / RECORDER	Vicky McKee 435-784-3154 vmckee@daggettcounty.org
CONSULTING ENGINEER:	Bret Reynolds CIVCO Engineering, Inc. 1256 West 400 South, Ste. 1 Vernal, UT 84078 435-789-5448 bretreynolds@ubtanet.com
CITY ATTORNEY:	Niel Lund 95 N 1st West Manila, UT 84046 435-503-4151 Nlund@daggettcounty.org

DRINKING WATER BOARD FINANCIAL ASSISTANCE EVALUATION

SYSTEM NAME: Dutch John
COUNTY: Daggett
PROJECT DESCRIPTION: Tank Repair, Upgrade Treatment Plant

FUNDING SOURCE: Federal SRF

80 % Loan & 20 % P.F.

ESTIMATED POPULATION:	185	NO. OF CONNECTIONS:	143 *	SYSTEM RATING:	APPROVED
CURRENT AVG WATER BILL:	$56.01 *			PROJECT TOTAL:	$362,000
CURRENT % OF AGI:	1.54%	FINANCIAL PTS:	41	LOAN AMOUNT:	$288,000
ESTIMATED MEDIAN AGI:	$43,604			PRINC. FORGIVENESS:	$74,000
STATE AGI:	$39,325			TOTAL REQUEST:	$362,000
SYSTEM % OF STATE AGI:	111%				

	@ ZERO % RATE	@ RBBI MKT RATE		AFTER REPAYMENT PENALTY & POINTS
	0%	5.35%		1.72%
SYSTEM				
ASSUMED LENGTH OF DEBT, YRS:	30	30		30
ASSUMED NET EFFECTIVE INT. RATE:	0.00%	5.35%		1.72%
REQUIRED DEBT SERVICE:	$9,600.00	$19,488.84		$12,369.40
*PARTIAL COVERAGE (15%):	$0.00	$0.00		$0.00
*ADD. COVERAGE AND RESERVE (10%):	$960.00	$1,948.88		$1,236.94
ANNUAL NEW DEBT PER CONNECTION:	$73.85	$149.91		$95.15
O & M + FUNDED DEPRECIATION:	$91,677.00	$91,677.00		$91,677.00
OTHER DEBT + COVERAGE:	$10,875.00	$10,875.00		$10,875.00
REPLACEMENT RESERVE ACCOUNT:	$5,498.85	$5,993.29		$5,637.32
ANNUAL EXPENSES PER CONNECTION:	$755.60	$759.06		$756.57
TOTAL SYSTEM EXPENSES	$118,610.85	$129,983.02		$121,795.66
TAX REVENUE:	$0.00	$0.00		$0.00
RESIDENCE				
MONTHLY NEEDED WATER BILL:	$69.12	$75.75		$70.98
% OF ADJUSTED GROSS INCOME:	1.90%	2.08%		1.95%

* Equivalent Residential Connections

R309-700-5

Dutch John
Daggett
October 6, 2014

TABLE 2
FINANCIAL CONSIDERATIONS

		POINTS	
1. COST EFFECTIVENESS RATIO (SELECT ONE)			
A. Project cost $0 to $500 per benefitting connection		16	
B. $501 to $1,500		14	
C. $1,501 to $2,000		11	
D. $2,001 to $3,000		8	X
E. $3,001 to $5,000		4	
F. $5,001 to $10,000		1	
G. Over $10,000		0	
	$2,531		
2. CURRENT LOCAL MEDIAN ADJUSTED GROSS INCOME (AGI) (SELECT ONE)			
A. Less than 70% of State Median AGI		19	
B. 71 to 80% of State Median AGI		16	
C. 81 to 95% of State Median AGI		13	
D. 96 to 110% of State Median AGI		9	X
E. 111 to 130% of State Median AGI		6	
E. 131 to 150% of State Median AGI		3	
F. Greater than 150% of State Median AGI		0	
	111%		
3. PROJECT FUNDING CONTRIBUTED BY APPLICANT (SELECT ONE)			
a. Greater than 25% of project funds		17	
b. 15 to 25% of project funds		14	
c. 10 to 15% of project funds		11	
c. 5 to 10% of project funds		8	
d. 2 to 5% of project funds		4	
e. Less than 2% of project funds		0	X
	0.0%		
4. ABILITY TO REPAY LOAN			
4. WATER BILL (INCLUDING TAXES) AFTER PROJECT IS BUILT RELATIVE TO LOCAL MEDIAN ADJUSTED GROSS INCOME (SELECT ONE)			
a. Greater than 2.50% of local median AGI		16	
b. 2.01 to 2.50% of local median AGI		12	
c. 1.51 to 2.00% of local median AGI		8	X
d. 1.01 to 1.50% of local median AGI		3	
e. 0 to 1.00% of local median AGI		0	
	1.95%		
5. SPECIAL INCENTIVE POINTS Applicant: (Mark all that apply)			
A. has a replacement fund receiving annual deposits of 5% of the system's drinking water budget been established, and has already accumulated a minimum of 10% of said annual DW budget in this reserve fund.		5	X
B. Has a replacement fund equal to at least 15% or 20% of annual DW budget.		5	X
C. Is creating or enhancing a regionalization plan		16	
D. Has a rate structure encouraging conservation		6	X
TOTAL POINTS FOR FINANCIAL NEED		41	
TOTAL POSSIBLE POINTS FOR FINANCIAL NEED		100	

Dutch John

PROPOSED BOND REPAYMENT SCHEDULE

80 % Loan & 20 % P.F.

PRINCIPAL	$288,000.00	ANTICIPATED CLOSING DATE	26-Jan-15
INTEREST	1.72%	P&I PAYMT DUE	10-Jan-16
TERM	30	REVENUE BOND	
NOMIN. PAYMENT	$12,369.40	PRINC PREPAID:	$0.00

YEAR	BEGINNING BALANCE	DATE OF PAYMENT	PAYMENT		PRINCIPAL	INTEREST	ENDING BALANCE	PAYM NO.
2016	$288,000.00		$4,609.60	*	$0.00	$4,609.60	$288,000.00	0
2017	$288,000.00		$11,953.60		$7,000.00	$4,953.60	$281,000.00	1
2018	$281,000.00		$12,833.20		$8,000.00	$4,833.20	$273,000.00	2
2019	$273,000.00		$12,695.60		$8,000.00	$4,695.60	$265,000.00	3
2020	$265,000.00		$12,558.00		$8,000.00	$4,558.00	$257,000.00	4
2021	$257,000.00		$12,420.40		$8,000.00	$4,420.40	$249,000.00	5
2022	$249,000.00		$12,282.80		$8,000.00	$4,282.80	$241,000.00	6
2023	$241,000.00		$12,145.20		$8,000.00	$4,145.20	$233,000.00	7
2024	$233,000.00		$12,007.60		$8,000.00	$4,007.60	$225,000.00	8
2025	$225,000.00		$12,870.00		$9,000.00	$3,870.00	$216,000.00	9
2026	$216,000.00		$12,715.20		$9,000.00	$3,715.20	$207,000.00	10
2027	$207,000.00		$12,560.40		$9,000.00	$3,560.40	$198,000.00	11
2028	$198,000.00		$12,405.60		$9,000.00	$3,405.60	$189,000.00	12
2029	$189,000.00		$12,250.80		$9,000.00	$3,250.80	$180,000.00	13
2030	$180,000.00		$12,096.00		$9,000.00	$3,096.00	$171,000.00	14
2031	$171,000.00		$11,941.20		$9,000.00	$2,941.20	$162,000.00	15
2032	$162,000.00		$12,786.40		$10,000.00	$2,786.40	$152,000.00	16
2033	$152,000.00		$12,614.40		$10,000.00	$2,614.40	$142,000.00	17
2034	$142,000.00		$12,442.40		$10,000.00	$2,442.40	$132,000.00	18
2035	$132,000.00		$12,270.40		$10,000.00	$2,270.40	$122,000.00	19
2036	$122,000.00		$12,098.40		$10,000.00	$2,098.40	$112,000.00	20
2037	$112,000.00		$11,926.40		$10,000.00	$1,926.40	$102,000.00	21
2038	$102,000.00		$12,754.40		$11,000.00	$1,754.40	$91,000.00	22
2039	$91,000.00		$12,565.20		$11,000.00	$1,565.20	$80,000.00	23
2040	$80,000.00		$12,376.00		$11,000.00	$1,376.00	$69,000.00	24
2041	$69,000.00		$12,186.80		$11,000.00	$1,186.80	$58,000.00	25
2042	$58,000.00		$11,997.60		$11,000.00	$997.60	$47,000.00	26
2043	$47,000.00		$11,808.40		$11,000.00	$808.40	$36,000.00	27
2044	$36,000.00		$12,619.20		$12,000.00	$619.20	$24,000.00	28
2045	$24,000.00		$12,412.80		$12,000.00	$412.80	$12,000.00	29
2046	$12,000.00		$12,206.40		$12,000.00	$206.40	$0.00	30
			$375,410.40		$288,000.00	$87,410.40		

*Interest Only Payment

Dutch John

DWB Loan Terms		
Local Share (total):	$	-
Other Agency Funding:	$	-
DWB Grant Amount:	$	74,000
DWB Loan Amount:	$	288,000
DWB Loan Term:		30
DWB Loan Interest:		**1.72%**
DWB Loan Payment:	$	12,369

DW Expenses (Estimated)		
Proposed Facility Capital Cost:	$	362,000
Existing Facility O&M Expense:	$	91,677
Proposed Facility O&M Expense:	$	91,677
O&M Inflation Factor:		**1.0%**
Existing Debt Service:	$	8,700

DW Revenue Sources (Projected)		
Beginning Cash:	$	-
Existing Customers (ERC):		143
Projected Growth Rate:		**1.0%**
Impact Fee/Connection Fee:	$	-
Current Monthly User Charge:	$	56.01
Needed Average Monthly User Charge:	$	70.98

DW Revenue Projections

Yr	Growth Rate (%)	Annual Growth (ERC)	Total Users (ERC)	User Charge Revenue	Impact Fee Revenue	Property Tax Revenue	Total Revenue	DWB Loan Repayment	DWB Loan Reserves	Remaining Principal	Principal Payment	Interest Payment	Existing DW Debt Service	O&M Expenses	Total Expenses	Debt Service Ratio
0	1.0%	1	143	96,118	-	-	96,118	**-**	**-**	288,000	-	-	8,700	91,677	100,377	-
1	1.0%	1	144	122,647	-	-	122,647	**11,954**	**1,237**	281,000	7,000	4,954	8,700	91,677	113,568	1.50
2	1.0%	2	146	124,351	-	-	124,351	**12,833**	**1,237**	273,000	8,000	4,833	8,700	92,594	115,364	1.47
3	1.0%	1	147	125,203	-	-	125,203	**12,696**	**1,237**	265,000	8,000	4,696	8,700	93,520	116,152	1.48
4	1.0%	2	149	126,906	-	-	126,906	**12,558**	**1,237**	257,000	8,000	4,558	8,700	94,455	116,950	1.53
5	1.0%	1	150	127,758	-	-	127,758	**12,420**	**1,237**	249,000	8,000	4,420	8,700	95,399	117,757	1.53
6	1.0%	2	152	129,461	-	-	129,461	**12,283**	**1,237**	241,000	8,000	4,283	8,700	96,353	118,573	1.58
7	1.0%	1	153	130,313	-	-	130,313	**12,145**	**1,237**	233,000	8,000	4,145	8,700	97,317	119,399	1.58
8	1.0%	2	155	132,016	-	-	132,016	**12,008**	**1,237**	225,000	8,000	4,008	8,700	98,290	120,235	1.63
9	1.0%	1	156	132,868	-	-	132,868	**12,870**	**1,237**	216,000	9,000	3,870	8,700	99,273	122,080	1.56
10	1.0%	2	158	134,571	-	-	134,571	**12,715**	**1,237**	207,000	9,000	3,715	8,700	100,266	122,918	1.60
11	1.0%	2	160	136,275	-	-	136,275	**12,560**		198,000	9,000	3,560	8,700	101,268	122,529	1.65
12	1.0%	1	161	137,127	-	-	137,127	**12,406**		189,000	9,000	3,406	8,700	102,281	123,387	1.65
13	1.0%	2	163	138,830	-	-	138,830	**12,251**		180,000	9,000	3,251	8,700	103,304	124,255	1.70
14	1.0%	1	164	139,682	-	-	139,682	**12,096**		171,000	9,000	3,096	8,700	104,337	125,133	1.70
15	1.0%	2	166	141,385	-	-	141,385	**11,941**		162,000	9,000	2,941	8,700	105,380	126,022	1.74
16	1.0%	2	168	143,089	-	-	143,089	**12,786**		152,000	10,000	2,786	8,700	106,434	127,921	1.71
17	1.0%	1	169	143,940	-	-	143,940	**12,614**		142,000	10,000	2,614	8,700	107,498	128,813	1.71
18	1.0%	2	171	145,644	-	-	145,644	**12,442**		132,000	10,000	2,442	8,700	108,573	129,716	1.75
19	1.0%	2	173	147,347	-	-	147,347	**12,270**		122,000	10,000	2,270	8,700	109,659	130,630	1.80
20	1.0%	1	174	148,199	-	-	148,199	**12,098**		112,000	10,000	2,098	8,700	110,756	131,554	1.80
21	1.0%	2	176	149,902	-	-	149,902	**11,926**		102,000	10,000	1,926	8,700	111,863	132,490	1.84
22	1.0%	2	178	151,606	-	-	151,606	**12,754**		91,000	11,000	1,754	8,700	112,982	134,436	1.80
23	1.0%	2	180	153,309	-	-	153,309	**12,565**		80,000	11,000	1,565	8,700	114,112	135,377	1.84
24	1.0%	2	182	155,013	-	-	155,013	**12,376**		69,000	11,000	1,376	8,700	115,253	136,329	1.89
25	1.0%	1	183	155,864	-	-	155,864	**12,187**		58,000	11,000	1,187	8,700	116,405	137,292	1.89
26	1.0%	2	185	157,568	-	-	157,568	**11,998**		47,000	11,000	998	8,700	117,570	138,267	1.93
27	1.0%	2	187	159,271	-	-	159,271	**11,808**		36,000	11,000	808	8,700	118,745	139,254	1.98
28	1.0%	2	189	160,975	-	-	160,975	**12,619**		24,000	12,000	619	8,700	119,933	141,252	1.93
29	1.0%	2	191	162,678	-	-	162,678	**12,413**		12,000	12,000	413	8,700	121,132	142,245	1.97
30	1.0%	2	193	164,382	-	-	164,382	**12,206**		-	12,000	206	8,700	122,343	143,250	2.01
									Total Paid in Debt Service =		288,000	82,801				

Utah Department of Environmental Quality

Division of Drinking Water

Public Water System Master Report

Run Date:
10/08/2014 01:20 pm

PWS ID: UTAH05001 ***Name:*** DUTCH JOHN TOWN WATER SYSTEM

Legal Contact DUTCH JOHN
DOUGLAS LEE SANDS

Address: PO BOX 186
DUTCH JOHN, UT 84023

Phone Number: 385-205-0615

City Served (Area):

County: DAGGETT COUNTY

Rating: Approved

Rating Date: 02/22/2011

Activity Status: A

Consumptive Use Zone
Irrigation Zone Number: 2 02/15/2013

System Type: Community

Population: 185

Last Inv Update: 03/12/2014

Last Snty Srv Dt: 11/17/2010

Surveyor: STEVEN J ONYSKO

Oper Period: 1/1 to 12/31

Contacts

Contact Type	Name	Title	Phone Numbers Office	Emergency	Email Address
AC	SANDS, DOUGLAS LEE		385-205-0615	385-205-0615	dsands@daggettcounty.org

Service Connections

Connection Type	Meter Type Code	Meter Size	Number Connections	
Residential	Unmetered	0	90	
Commercial	Unknown	0	18	
			108	Total Svc Connections

Storage

Total Storage: 378,000 GAL ***Number of Units:*** 3

No.	Name	Type	Effective Volume	Constr Matrl	Activity Status	Activity Status Reason	Press'd
ST001	STORAGE ST001 18K	Ground	18,000 GAL	Concrete	A		NO
ST002	STORAGE ST002 60K	Ground	60,000 GAL	Steel	A		
ST003	STORAGE ST003 300K	Ground	300,000 GAL	Steel	A		

Treatment Plants

No.	Plant Name	BIN Type	BIN Status	BIN Date	App Design Cap (milgal/day)	Activity Status	Activity Status Reason	Treatment Process
TP001	FLAMING GORGE WTP	1	Determined	12/14/2010		A		

Pumping Stations

Facility No	Facility Name	Activity Status	Activity Status Reason	Capacity	Avail
PF001	PEAK & FIRE BOOSTERS	A	OP Issued		P
PF002	AIRPORT RD. PS ABANDONED	I	Abandoned		P

Sources

No.	Source Name	Activity Status	Activity Status Reason	Source Type	Safe Yield *	Pump Capacity	Location Data On File	Water Type	Availability	Period of Operation
WS001	FLAMING GORGE RESERV(	Active		IN			Yes	SW	Permanent	1/1 to 12/31

**Reports measured flow for wells, approved design capacity for all other sources.*

Sampling and Monitoring Requirements

Total Coliform Rule Monitoring

Sample Count	Sample Type	Sample Frequency	Effective Begin Date	Effective End Date	Seasonal Start	Seasonal End	Analyte Code	Analyte Name
1	Routine	Monthly	02/01/2010		1/1	12/31	3100	COLIFORM (TCR)

Additional Monitoring Requirements

Facility ID	Facility Name / Analyte Name		Sample Count	Sample Type	Sample Frequency	Last Sample	Next Sample Between
DS001	UTAH05001 DISTRIBUTION SYSTEM			Activity Status: A		Sample Label: UTAH05001 DS001	
	Disinfection Byproducts Stage 2		1	Routine	Year		
	MR001	115 SECOND AVE				07/29/2014	AUGUST 2015
	Lead & Copper		5	Routine	3 Years	2012	06/01-09/30 2015
TP001	FLAMING GORGE WTP			Activity Status: A		Sample Label: UTAH05001 TP001 TP001	
	CARBON, TOTAL		1	Routine	MN	09/04/2014	10/01/2014-10/31/2014
	NITRATE		1	Routine	Year	07/09/2013	01/01/2014-12/31/2014
	Radionuclides		1	Routine	9 Years	07/09/2013	01/01/2020-12/31/2028
	Volatile Organics		1	Routine	3 Years	07/09/2013	01/01/2014-12/31/2016
	Inorg & Metals		1	Routine	9 Years	03/10/2014	01/01/2020-12/31/2028
	Sodium, Sulfate, TDS		1	Routine	9 Years	03/10/2014	01/01/2020-12/31/2028
	Pesticides		1	Routine	3 Years	02/04/2013	01/01/2014-12/31/2016
WS001	FLAMING GORGE RESERVOIR INTAKE			Activity Status: A		Sample Label: UTAH05001 WS001	
	Total Organic Carbon and Alkalinity		1	Routine	Month	09/04/2014	10/01/2014-10/31/2014

Improvement Priority System

Total IPS Points: **-20** **Rating Date:** 02/22/2011 **Rating:** **Approved**

Admin & Physical Facilities:	0
*** Qualtiy & Monitoring Violations:**	0
Operator Certification:	-20

* Total Admin & Physical Facilities demerit points may not agree with the detail section. The detail section shows all 'open' physical deficiencies; the Total Admin & Physical Facilities value adjusts for duplicate deficiencies

Operator Certification Points

	Distribution	*Treatment*	
Level Required	**SS**	**T1**	
Highest Certificate on Record	**D2**	**T2**	
Points	**-10**	**-10**	***Total Points*** **-20**

Certified Operators

License Number	Operator Name	Address	CEU's	Cert Grade	Expiration
12800	SANDS, DOUGLAS LEE	PO BOX 186; DUTCH JOHN, UT 84023			
			6.7	T2	12/31/2014
			3.7	D2	12/31/2015
141145	SLAUGH, JESSE EDWARD	PO BOX 180; DUTCH JOHN, UT 84023			
				T1	12/31/2017
09628	WILDE, KELLY REED	PO BOX 468; MANILA, UT 84046			
			1.7	D1	12/31/2015
			12.2	T1	12/31/2012

Total Coliform Sample History

For the 13 Months Beginning 10/01/2013

		TCR Routine Samples			TCR Repeat Samples			Source Samples		
		No Samp	TC Pos.	Ecoli Pos.	No Samp	TC Pos.	Ecoli. Pos.	No Samp	TC Pos	Ecoli Pos.
Oct	2013	1	0	0	0	0	0	0	0	0
Nov	2013	1	0	0	0	0	0	0	0	0
Dec	2013	1	0	0	0	0	0	0	0	0
Jan	2014	1	0	0	0	0	0	0	0	0
Feb	2014	1	0	0	0	0	0	0	0	0
Mar	2014	1	0	0	0	0	0	0	0	0
Apr	2014	1	0	0	0	0	0	0	0	0
May	2014	1	0	0	0	0	0	0	0	0
Jun	2014	1	0	0	0	0	0	0	0	0
Jul	2014	1	0	0	0	0	0	0	0	0
Aug	2014	1	0	0	0	0	0	0	0	0
Sep	2014	0	0	0	0	0	0	0	0	0
Oct	2014	0	0	0	0	0	0	0	0	0

Last sample taken 09/04/2014 from UT00027 CHEMTECH/FORD CHEMICAL LAB

Agenda Item 5(C)(ii)(c)

West Erda Improvement District
Presented to the Drinking Water Board
November 7, 2014

DRINKING WATER BOARD
BOARD PACKET FOR CONSTRUCTION LOAN

APPLICANT'S REQUEST:

West Erda Improvement District (WEID) is requesting financial assistance in the amount of $1,478,600 to upgrade their existing distribution system, install a transmission line to connect to Erda Acres Improvement District (EAID) and purchase capacity in EAID's source and storage facilities. They scored 82.6 points on the project priority list.

STAFF COMMENTS:

The culinary water distribution system of WEID consists of smaller diameter PVC piping, and one operating well. There is no storage for this system. The water rights currently owned by WEID will not support future development. The well casing has been compromised and is under suspicion of surface water influence; therefore, a boil order is currently in place. The distribution system has inadequate operating pressures as indicated by customer complaints. The system does not meet current State fire codes due to no storage facilities and limited pump capacity at the functioning well. For these reasons, many of the residents in the area have resorted to developing their own private wells and not connecting to the system. The WEID culinary water system is in desperate need of rehabilitation and expansion in order to bring it up to current State standards.

The proposed project consists of making the necessary upgrades to their existing distribution system, installing a transmission line to connect to EAID, and purchasing capacity in EAID's source and storage facilities. WEID will need to expand their boundaries to include the lots adjacent to the transmission line that will benefit from fire protection. The cost sharing for the project will involve the 17 connections in the current WEID boundary, the 36 other connections in their boundary that are not connected and have private wells, and the 54 lots that will be part of the expanded District boundary along the transmission line. They are proposing that the cost to these areas will be based proportionally on the cost of the infrastructure they are benefiting from (See Project Details).

The local MAGI for the WEID is $29,797, which is 79% of the State MAGI. The current 17 connections have a water bill of approximately $79 per month, which is 3.18% of local MAGI, so the District qualifies to be considered for additional subsidization. Based on a loan of $739,000 at 0% interest for 30 year, with a grant of $739,600, the following water bills should be expected for the 3 areas involved in the project:

District Areas:	ERC	Current Water Bill	Water Bill after Project	% MAGI
WEID (current)	17	$79	$109	4.39
WEID (on private wells)	36	$0	$30	1.21
WEID (expanded)	54	$0	$18	.72

Note: The existing WEID boundary will be paying 62 % of the annual debt service and the WEID expanded area will pay 38%

FINANCIAL ASSISTANCE COMMITTEE RECOMMENDATION:

The Financial Assistance Committee recommends that the Drinking Water Board authorize a loan of $1,478,600 at 0% interest for 30 years to West Erda Improvement District with $739,600 in grant.

Funding is Contingent Upon:

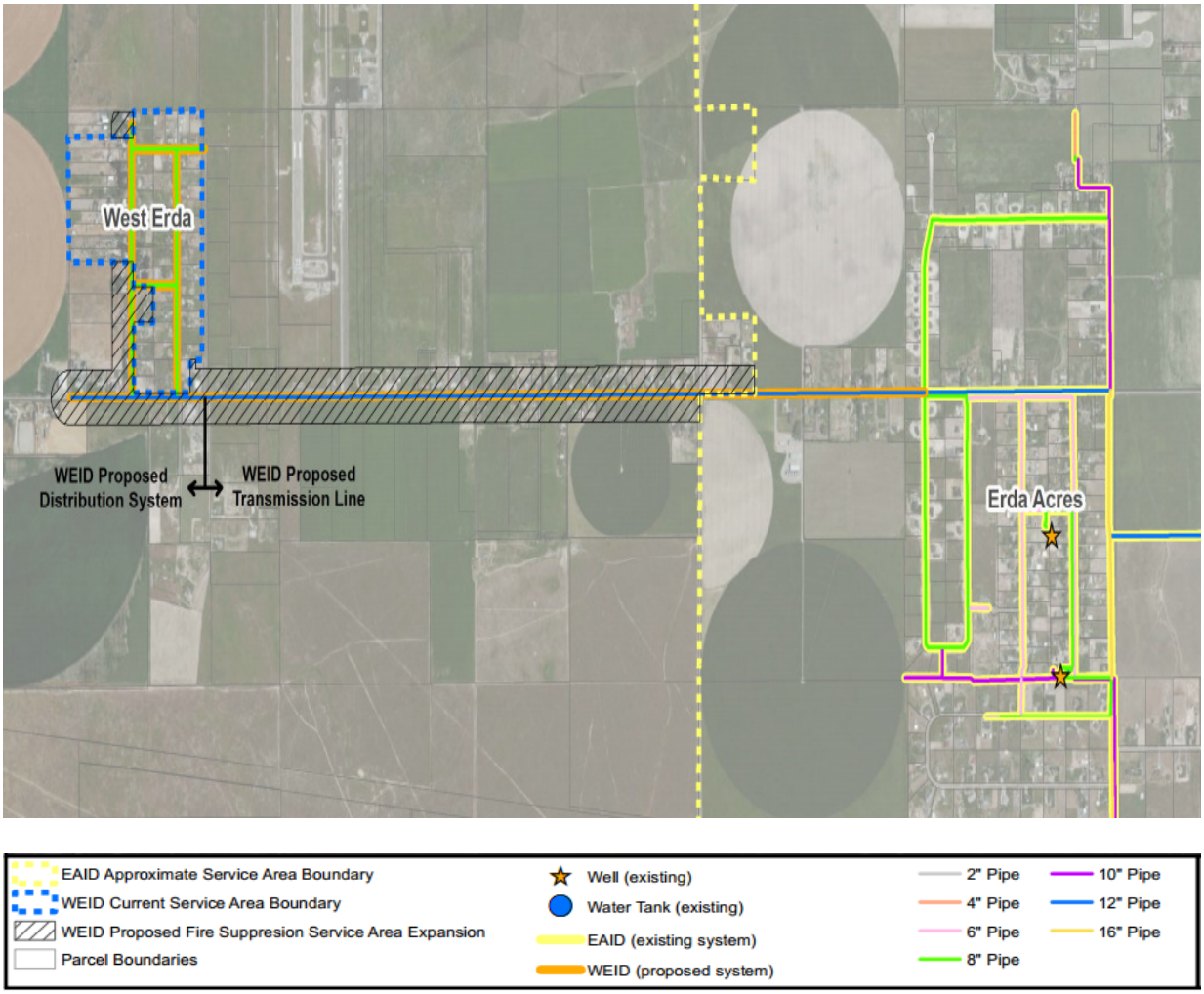
1) **The District's authority and ability to expand their boundary and implement the cost share proposed for the project to include all 53 lots in WEID as well as the 54 lots along the transmission line that are currently not included in their boundary.**

2) **Evidence of public support for the cost share on the project for all lots impacted.**

APPLICANT'S LOCATION:

WEID is located in Tooele County.

MAP OF APPLICANT'S LOCATION:



PROJECT DESCRIPTION:

The WEID Project will include the following tasks:

- Connecting to the existing EAID with approximately 11,000 feet of 12-inch transmission line with appurtenances.

- WEID distribution system upgrades will include installing approximately 5,800 feet of 8-inch water line, along with 34 fire hydrants and valves. 53 service connections and service meters will be installed.

- Capacity in the existing EAID storage and source facilities will be purchased by WEID.

The cost for the project is being shared by the different areas being served and benefitted by the project. The existing boundary of the WEID consists of 17 lots currently connected to the system and 36 lots on private wells. They will share the cost of the distribution systems improvements, the storage and source capacity buy-in from EAID and a portion of the transmission line (62% of total project cost). The WEID expanded area, along the transmission line, consists of 54 connections. They will share the cost of a portion of the transmission line, and a portion of the storage and source capacity buy-in from EAID as they will be benefitting by the fire suppression that the line and hydrants provide (38% of total project cost).

POPULATION GROWTH:

According to the Utah State Governor's Office of Planning and Budgeting, the anticipated growth rate for Tooele County is approximately 2.66% per year over the next 40 years

	Year	Population
Current:	2014	67,150
Projected:	2050	148,486

IMPLEMENTATION SCHEDULE:

Apply to DWB for Construction Funds:	October 2014
SRF Committee Conference Call:	October 2014
DWB Funding Authorization:	November 2014
Advertise Environmental Assessment:	February 2014
Complete Design:	February 2014
Plan Approval:	March 2014
Advertise for Bids:	March 2014
Bid Opening:	March 2014
Loan Closing:	April 2014
Begin Construction:	April 2014
Complete Construction:	July 2014
Receive Operating Permit:	August 2014

COST ESTIMATE:

Legal and Bonding	$26,000
Environmental	$3,000
Inter-local Agreements	$10,000
Engineering- Design	$60,000
Engineering- CMS	$73,000
Engineering- local agreements	$8,000
Storage/Source Buy-in	$120,200
Construction	$1,024,400
Contingency	$154,000
Total Project Cost	**$1,478,600**

COST ALLOCATION:

The cost allocation proposed for the project is shown below.

Funding Source	Cost Sharing	Percent of Project
DWB Loan (0%, 30-yr)	$739,000	50%
DWB Grant	$739,600	50%
Total Amount	$1,478,600	100%

ESTIMATED ANNUAL COST OF WATER SERVICE:

Operation and Maintenance plus Depreciation: $29,876
Existing DW Debt Service: $0
DDW Debt Service (0%, 30-yrs): $24,633.33
DDW Debt Reserve: $2,463.33
Replacement Reserve Account: $3,695
Annual Cost/ERC: $3,568.69
Monthly Cost/ERC to WEID (current): $109
Monthly Cost/ERC to WEID (on private wells): $30
Monthly Cost/ERC to WEID expanded: $18
Cost as % MAGI to WEID current: 4.39%

APPLICANT:	West Erda Improvement District 47 South Main Tooele, Utah 84074
PRESIDING OFFICIAL & CONTACT PERSON:	Jerry Houghton 47 South Main Tooele, UT 84074 435-843-3180 jhoughton@co.tooele.ut.us
BOND ATTORNEY:	Alex Buxton Zions First National Bank One South Main Street, 18th floor Salt Lake City, UT 84111
CONSULTING ENGINEER:	Darin Robinson Jones and DeMille Engineering 1535 South 100 West Richfield, UT 84701 Email: darin@jonesanddemille.com 435-896-8266

DRINKING WATER BOARD FINANCIAL ASSISTANCE EVALUATION

SYSTEM NAME: West Erda
COUNTY: Tooele
PROJECT DESCRIPTION: Transmission Line and Distrubution Improvements

FUNDING SOURCE: Federal SRF

50 % Loan & 50 % P.F.

ESTIMATED POPULATION:	158	NO. OF CONNECTIONS:	17 *	SYSTEM RATING:	APPROVED
CURRENT AVG WATER BILL:	$78.89 *			PROJECT TOTAL:	$1,478,600
CURRENT % OF AGI:	3.18%	FINANCIAL PTS:	53	LOAN AMOUNT:	$739,000
ESTIMATED MEDIAN AGI:	$29,797			PRINC. FORGIVENESS:	$739,600
STATE AGI:	$39,325			TOTAL REQUEST:	$1,478,600
SYSTEM % OF STATE AGI:	76%				

	@ ZERO % RATE	@ RBBI MKT RATE		AFTER REPAYMENT PENALTY & POINTS
	0%	4.93%		0.00%
SYSTEM				
ASSUMED LENGTH OF DEBT, YRS:	30	30		30
ASSUMED NET EFFECTIVE INT. RATE:	0.00%	4.93%		0.00%
REQUIRED DEBT SERVICE:	$24,633.33	$47,690.10		$24,633.33
*PARTIAL COVERAGE (15%):	$3,695.00	$7,153.51		$3,695.00
*ADD. COVERAGE AND RESERVE (10%):	$2,463.33	$4,769.01		$2,463.33
ANNUAL NEW DEBT PER CONNECTION:	$1,811.27	$3,506.62		$1,811.27
O & M + FUNDED DEPRECIATION:	$29,876.00	$29,876.00		$29,876.00
OTHER DEBT + COVERAGE:	$0.00	$0.00		$0.00
REPLACEMENT RESERVE ACCOUNT:	$0.00	$0.00		$0.00
ANNUAL EXPENSES PER CONNECTION:	$1,757.41	$1,757.41		$1,757.41
TOTAL SYSTEM EXPENSES	$60,667.67	$89,488.62		$60,667.67
TAX REVENUE:	$0.00	$0.00		$0.00
RESIDENCE				
MONTHLY NEEDED WATER BILL:				
WEID	$297.39	$438.67		**$109.00**
WEID on wells				**$30.00**
WEID expanded				**$18.00**
% OF ADJUSTED GROSS INCOME:	11.98%	17.67%		4.39%

* Equivalent Residential Connections

R309-700-5

West Erda
Tooele
October 20, 2014

TABLE 2
FINANCIAL CONSIDERATIONS

		POINTS	
1. COST EFFECTIVENESS RATIO (SELECT ONE)			
A. Project cost $0 to $500 per benefitting connection		16	
B. $501 to $1,500		14	
C. $1,501 to $2,000		11	
D. $2,001 to $3,000		8	
E. $3,001 to $5,000		4	
F. $5,001 to $10,000		1	
G. Over $10,000		0	X
	$86,976		
2. CURRENT LOCAL MEDIAN ADJUSTED GROSS INCOME (AGI) (SELECT ONE)			
A. Less than 70% of State Median AGI		19	
B. 71 to 80% of State Median AGI		16	X
C. 81 to 95% of State Median AGI		13	
D. 96 to 110% of State Median AGI		9	
E. 111 to 130% of State Median AGI		6	
E. 131 to 150% of State Median AGI		3	
F. Greater than 150% of State Median AGI		0	
	76%		
3. PROJECT FUNDING CONTRIBUTED BY APPLICANT (SELECT ONE)			
a. Greater than 25% of project funds		17	
b. 15 to 25% of project funds		14	
c. 10 to 15% of project funds		11	
c. 5 to 10% of project funds		8	
d. 2 to 5% of project funds		4	
e. Less than 2% of project funds		0	X
	0.0%		
4. ABILITY TO REPAY LOAN			
4. WATER BILL (INCLUDING TAXES) AFTER PROJECT IS BUILT RELATIVE TO LOCAL MEDIAN ADJUSTED GROSS INCOME (SELECT ONE)			
a. Greater than 2.50% of local median AGI		16	X
b. 2.01 to 2.50% of local median AGI		12	
c. 1.51 to 2.00% of local median AGI		8	
d. 1.01 to 1.50% of local median AGI		3	
e. 0 to 1.00% of local median AGI		0	
	4.39%		
5. SPECIAL INCENTIVE POINTS Applicant: (Mark all that apply)			
A. has a replacement fund receiving annual deposits of 5% of the system's drinking water budget been established, and has already accumulated a minimum of 10% of said annual DW budget in this reserve fund.		5	
B. Has a replacement fund equal to at least 15% or 20% of annual DW budget.		5	X
C. Is creating or enhancing a regionalization plan		16	X
D. Has a rate structure encouraging conservation		6	
TOTAL POINTS FOR FINANCIAL NEED		53	
TOTAL POSSIBLE POINTS FOR FINANCIAL NEED		100	

West Erda

PROPOSED BOND REPAYMENT SCHEDULE

50 % Loan & 50 % P.F.

PRINCIPAL	$739,000.00	ANTICIPATED CLOSING DATE	01-Feb-15
INTEREST	0.00%	FIRST P&I PAYMENT DUE	01-Jan-16
TERM	30	REVENUE BOND	
NOMIN. PAYMENT	$24,633.33	PRINC PREPAID:	$0.00

YEAR	BEGINNING BALANCE	DATE OF PAYMENT	PAYMENT		PRINCIPAL	INTEREST	ENDING BALANCE	PAYM NO.
2015	$739,000.00		$0.00	*	$0.00	$0.00	$739,000.00	0
2016	$739,000.00		$25,000.00		$25,000.00	$0.00	$714,000.00	1
2017	$714,000.00		$25,000.00		$25,000.00	$0.00	$689,000.00	2
2018	$689,000.00		$25,000.00		$25,000.00	$0.00	$664,000.00	3
2019	$664,000.00		$25,000.00		$25,000.00	$0.00	$639,000.00	4
2020	$639,000.00		$25,000.00		$25,000.00	$0.00	$614,000.00	5
2021	$614,000.00		$25,000.00		$25,000.00	$0.00	$589,000.00	6
2022	$589,000.00		$25,000.00		$25,000.00	$0.00	$564,000.00	7
2023	$564,000.00		$25,000.00		$25,000.00	$0.00	$539,000.00	8
2024	$539,000.00		$25,000.00		$25,000.00	$0.00	$514,000.00	9
2025	$514,000.00		$24,000.00		$24,000.00	$0.00	$490,000.00	10
2026	$490,000.00		$25,000.00		$25,000.00	$0.00	$465,000.00	11
2027	$465,000.00		$24,000.00		$24,000.00	$0.00	$441,000.00	12
2028	$441,000.00		$25,000.00		$25,000.00	$0.00	$416,000.00	13
2029	$416,000.00		$24,000.00		$24,000.00	$0.00	$392,000.00	14
2030	$392,000.00		$25,000.00		$25,000.00	$0.00	$367,000.00	15
2031	$367,000.00		$24,000.00		$24,000.00	$0.00	$343,000.00	16
2032	$343,000.00		$25,000.00		$25,000.00	$0.00	$318,000.00	17
2033	$318,000.00		$24,000.00		$24,000.00	$0.00	$294,000.00	18
2034	$294,000.00		$25,000.00		$25,000.00	$0.00	$269,000.00	19
2035	$269,000.00		$24,000.00		$24,000.00	$0.00	$245,000.00	20
			$494,000.00		$494,000.00	$0.00		

*Interest Only Payment

West Erda

DWB Loan Terms		
Local Share (total):	$	-
Other Agency Funding:	$	-
DWB Grant Amount:	$	739,600
DWB Loan Amount:	$	739,000
DWB Loan Term:		30
DWB Loan Interest:		**0.00%**
DWB Loan Payment:	$	24,633

DW Expenses (Estimated)		
Proposed Facility Capital Cost:		#VALUE!
Existing Facility O&M Expense:	$	29,876
Proposed Facility O&M Expense:	$	29,876
O&M Inflation Factor:		**1.0%**
Existing Debt Service:	$	-

DW Revenue Sources (Projected)		
Beginning Cash:	$	-
Existing Customers (ERC):		17
Projected Growth Rate:		**1.0%**
Impact Fee/Connection Fee:	$	5,000
Current Monthly User Charge:	$	78.89
Needed Average Monthly User Charge:	$	109.00

DW Revenue Projections

Yr	Growth Rate (%)	Annual Growth (ERC)	Total Users (ERC)	User Charge Revenue	Impact Fee Revenue	Property Tax Revenue	Total Revenue	DWB Loan Repayment	DWB Loan Reserves	Remaining Principal	Principal Payment	Interest Payment	Existing DW Debt Service	O&M Expenses	Total Expenses	Debt Service Ratio
0	1.0%	0	17	16,094	-	-	16,094	**-**	**-**	739,000	-	-	-	29,876	29,876	-
1	1.0%	0	17	22,236	-	-	22,236	**25,000**	**2,463**	714,000	25,000	-	-	29,876	57,339	- 0.31
2	1.0%	0	17	22,236	-	-	22,236	**25,000**	**2,463**	689,000	25,000	-	-	30,175	57,638	- 0.32
3	1.0%	1	18	23,544	5,000	-	28,544	**25,000**	**2,463**	664,000	25,000	-	-	30,477	57,940	- 0.08
4	1.0%	0	18	23,544	-	-	23,544	**25,000**	**2,463**	639,000	25,000	-	-	30,781	58,245	- 0.29
5	1.0%	0	18	23,544	-	-	23,544	**25,000**	**2,463**	614,000	25,000	-	-	31,089	58,552	- 0.30
6	1.0%	0	18	23,544	-	-	23,544	**25,000**	**2,463**	589,000	25,000	-	-	31,400	58,863	- 0.31
7	1.0%	0	18	23,544	-	-	23,544	**25,000**	**2,463**	564,000	25,000	-	-	31,714	59,177	- 0.33
8	1.0%	0	18	23,544	-	-	23,544	**25,000**	**2,463**	539,000	25,000	-	-	32,031	59,494	- 0.34
9	1.0%	1	19	24,852	5,000	-	29,852	**25,000**	**2,463**	514,000	25,000	-	-	32,351	59,815	- 0.10
10	1.0%	0	19	24,852	-	-	24,852	**24,000**	**2,463**	490,000	24,000	-	-	32,675	59,138	- 0.33
11	1.0%	0	19	24,852	-	-	24,852	**25,000**		465,000	25,000	-	-	33,002	58,002	- 0.33
12	1.0%	0	19	24,852	-	-	24,852	**24,000**		441,000	24,000	-	-	33,332	57,332	- 0.35
13	1.0%	0	19	24,852	-	-	24,852	**25,000**		416,000	25,000	-	-	33,665	58,665	- 0.35
14	1.0%	1	20	26,160	5,000	-	31,160	**24,000**		392,000	24,000	-	-	34,002	58,002	- 0.12
15	1.0%	0	20	26,160	-	-	26,160	**25,000**		367,000	25,000	-	-	34,342	59,342	- 0.33
16	1.0%	0	20	26,160	-	-	26,160	**24,000**		343,000	24,000	-	-	34,685	58,685	- 0.36
17	1.0%	0	20	26,160	-	-	26,160	**25,000**		318,000	25,000	-	-	35,032	60,032	- 0.35
18	1.0%	0	20	26,160	-	-	26,160	**24,000**		294,000	24,000	-	-	35,382	59,382	- 0.38
19	1.0%	1	21	27,468	5,000	-	32,468	**25,000**		269,000	25,000	-	-	35,736	60,736	- 0.13
20	1.0%	0	21	27,468	-	-	27,468	**24,000**		245,000	24,000	-	-	36,093	60,093	- 0.36
									Total Paid in Debt Service =		494,000	-				

Agenda Item 6(A)

Drinking Water Energy (Cost) Savings Handbook

November 2014

Cover photo: Jordan Valley Water Conservancy District's Webster Well

Courtesy of Kim Dyches, Division of Drinking Water

Drinking Water Energy (Cost) Savings Handbook

Table of Contents

Appendix, web links

A. Case Histories of Energy savings by Mountain Regional Water SSD, Logan City and Riverton City
B. Utah Drinking Water Board's SRF Program
C. Utah Energy Office's Program
D. Energy Service Companies' State based laws and lists
E. Rocky Mountain Power's Wattsmart program
F. Energy Audit Guidance websites
G. Other Helpful websites

Acknowledgements

This document was prepared by many people and it is appropriate that they be given credit for their work. I will proceed in giving credit consistent with the order in which this document is presented. I acknowledge the work done by **Steven Jones** with Hansen Allen & Luce, consulting engineers for pioneering the use of extended time running of hydraulic models to identify pump and piping changes that would enable energy savings. I thank **Frances Bernards**, Environmental Scientist with the Department of Environmental Quality's Business Assistance Program, for her work in researching and preparing case histories of the energy and cost savings for the three systems highlighted in Chapter 1. **Ryan Taylor**, with Epic Engineering provided information on the approach to selecting a consulting engineer.

The funding incentives provided by the **Drinking Water Board** is a matter, as set forth in State Statute (19-4 UCA) that must be formally acted upon by the Board. At the Board's August 27, 2014 meeting **Michael Grange**, Construction Assistance Section Manager within the Division, provided well-reasoned options for the Board to consider. The options were further addressed in a work meeting of the Board held prior to their November 7, 2014 meeting. Board members: **Paul Hansen**, Board Chair, **Betty Naylor**, Board Vice Chair, and members: **Brett Chynoweth**, **Tage Flint**, **Roger Fridal**, **Brad Johnson**, **David Sakrison**, **David Stevens**, and **Mark Stevens** provided valued direction to the Division.

Next I recognize **Doug Evans**, who prepared the entire contents of Chapter 2. The content of this chapter contains an extensive list of ideas that water systems can utilize to save money on their energy bills. **Doug Evans** has tried, with success, many of the ideas listed in the chapter for the benefit of the utility, Mountain Regional Water Special Service District (Summit County), he works for. It is important to note that the Water District's energy savings reported in Chapter 1 does not state that **Doug Evans'** work is complete. He has plans in the near term that he will pursue, which will increase the annual savings for his water system.

Chapter 3 of this document lists the funding opportunities provided by varies entities. As should be suspected, the individual sections were authored by representatives of these entities. Therefor I thank **Michael Grange**, who wrote the section dealing with the Drinking Water Board's funding program; **Jennifer Gardner**, of the Utah Office of Energy Development, who wrote the section dealing with her office's program; **Mark Cram**, with Siemens, an energy service company that is Certified by the State, who wrote the section dealing with Energy Service Companies; **Martie Leo**, and the Rocky Mountain Power External Communications Group, who wrote the section dealing with Rocky Mountain Power's Wattsmart Program; and **Johnathan Ward**, Vice President with Zions Bank, who wrote the section dealing with bank financing.

Kenneth H. Bousfield, P.E., Director
Utah Division of Drinking Water

1. Introduction

This document was prepared to provide water system operators and managers with ideas on how to save a significant amount of money by reducing the cost of power necessary to provide water to their customers. As a minimum, the ideas presented herein should enable water systems to lower the cost for power in spite of rate increases implemented by power companies in the coming years.

A. Energy Savings Potential: A number of drinking water systems throughout the State have realized significant dollar savings by implementing strategies that promote energy efficiencies. As an example, Mountain Regional Water Special Service District (Summit County) saved over $300,000.00 per year on projects throughout their system, Logan City (Cache County) saved nearly $119,800 per year by adding a new pressure zone, and Riverton City (Salt Lake County) saved over $42,000 per year on modifications to a single pump station. Each of these water systems were able to realize these savings by implementing one or more of the strategies listed in Chapter 2 of this handbook.

Equally interesting is the number of financing approaches available to water systems that take advantage of them. These include: a) low cost loans offered by the State's Drinking Water Board (administered by the Division of Drinking Water) as well as the State's Energy Office, b) design, build projects by State Pre-Qualified Energy Service Companies, c) cost reimbursement programs offered by Rocky Mountain Power, d) short term internal loans between two separate agencies within a city's or town's government, and of course e) bank financing.

B. How to Use This Document: This document is designed to give suggestions on: a) what to look for to save energy costs, b) where to look for funding needed to pay for changes in infrastructure, and c) where to look for helpful information available via the web.

The second chapter lists more than 300 ideas that may be available for water systems to take advantage of. Each section of this chapter has helpful icons in the left margin that will signify: 1) changes that water system operators and managers may implement, 2) changes that an appropriately qualified technical advisor may assist in identifying and 3) designed and constructed facilities. All of these changes and facilities, if instituted or constructed, will result in cost savings.

The third chapter lists six different funding sources for implementing ideas that save money. A description of these funding sources and the requirements needed to qualify are also provided. The Appendix lists helpful websites and gives a brief description of what the site offers as well as the web's URL address.

The first step in the process is to perform an **Energy Audit**. While this document does not give guidance on this process, multiple websites listed in Appendix F link to instructions on performing them. It is recommended that water system personnel and consultants perform an

energy audit to obtain a baseline of information. Energy audits are required by some of the funding entities. Also energy audits identify specific unit power costs which may identify obvious opportunities to save money by turning on high energy consuming facilities last and then turning them off first.

Significant additional help is provided in Chapter 2, which lists a wide range of ideas that could lead to energy savings. This chapter has helpful icons in the left margin that classify the ideas into specific categories: 1) Things water system personnel can do, 2) Things a consultant can assist water system personnel to do and 3) Things that require equipment replacement and/or construction. It should be noted that the line between: things water system personnel can do and thing consultants could assist water system personnel do, will vary depending upon the expertise of the water system personnel. The line between these two arrangements is drawn for the small water systems operator (a volunteer) in this document.

C. Finding the Right Consultant: The serious water system should consider pursuing all applicable suggestions listed in Chapter 2. When a water system proposes construction and/or equipment changes, the State requires that plans be submitted to the Division of Drinking Water. Such plans must be prepared by a licensed engineer. Ideally the selected engineer will be qualified to make meaningful recommendations regarding energy efficiency. To help ensure that the "expert" will provide the desired help, it is recommended that the water system go through a "Request for Qualification" (RFQ) process. In essence, the RFQ process involves sending out an invitation to multiple consultants to respond. In the response, the consultant provides information which the water system uses to select the best candidate consultant.

The RFQ should list the objectives of a proposed project, such as: "a desire to significantly reduce power costs for the utility". To enable applicants to provide meaningful and helpful information, the RFQ should include, possibly in a table format, the following information about the water system, including: number of pumps, age of each pump, horse power and flow rate of each pump, service area elevation range, number of pressure zones, and location, elevation and volume of each storage tank. The RFQ should include a request for at least the following information:

1. List the drinking water system the consultant has worked with and identify the energy cost savings each system realized. Provide contact information for the systems that the consultant worked with.

2. Provide the names of staff, including sub-contracted staff, which will be assigned to do the work for the water system. Include the water systems that each identified staff has done comparable work for. Also provide resumes of identified staff, including: education, training and applicable experience.

3. Provide a statement of the specific areas of opportunity for energy cost savings that the consultant feels can be implemented for the water system.

4. Provide a statement of the consultant's qualification to investigate each of the thirteen sections in Chapter 2 of this document. This should include any appropriate certification(s) that individuals or organizations who will work on the project will have, such as: 1) A Rocky Mountain Power certified energy auditor, 2) the Utah Office of Energy Development certified engineer or 3) State Certified Energy Service Company.

With the RFQ a water system must decide if they want to have a separate consultant to report on energy efficiency opportunities from the consultant that actually designs the project. If a second consultant is used then a second RFQ and selection process is needed. If the same consultant is used for both planning and design, additional questions may be desirable to ask in the RFP. The desired additional questions should focus on the experience related to the design of drinking water projects.

During the design phase, the consultant should also identify funding sources in cooperation with the water system. Chapter 3 of this document gives insights on 6 different sources of funding. Some funding may involve all or partial grant funding or cost recovery. Other sources of funding involve loans, with varying loan interest rates and loan time periods.

The appendix includes links to websites that provide helpful information. Most of the informational websites relate to specific funding options. Section F in the Appendix lists website dealing specifically with performing energy audits.

D. Drinking Water Board's State Revolving Fund: By State Statute, the Drinking Water Board has the authority to administer State funded drinking water projects. There are two sources of funds, federal and State, which the Board oversees. The Division of Drinking Water acts as staff to the Board in implementing the funding process. The Board offers the following incentives to applicants seeking financial assistance from the Board:

The details for qualifying and the amount of the interest rate reduction will be determined in subsequent Board meetings. When these decisions are finalized the details related to the qualification and the amount of reductions will be specified in this section of the Handbook.

2. Energy Saving Investigation Process

While the list below appears extensive, it is still not inclusive of everything, as such, do not become overwhelmed. The rewards of this exercise will likely be small in some areas, but can be great in others. Remember that summed together, they can show significant economies in operational performance and costs. Go about this effort in a spirit of learning, then teach or mentor others.

At the end of this chapter is a list of the meaning of all acronyms used within this chapter.

HAVEFUN!

Needs & Efforts

RESOURCE NEEDS AND EFFORT:

The following energy conservation inventory is divided into sections or groups of processes which possess similar efficiency characteristics. Each inventory item is further classified within the left page resource sidebar, with a road sign indicating the potential degree of difficulty or involvement needed to assess and remedy. The items are classified into three (3) energy auditing tiers alongside a corresponding project, or group of projects, indicating the possible resources needed to accomplish the tasks. The Tier indicator applies to all projects adjacent and below it, up to the next indicator presented. Be advised that the tier level may change depending on the proficiency of the water system. Some systems may be able to accomplish more tasks internally, and others may need more assistance than indicated. Each Auditing Tier is detailed below:

1. **TIER 1**. The square green sign signifies that the local water system personnel can most likely accomplish the evaluation or task. If not – the system should look to the Rural Water Association for training and/or assistance (see Tier 2 below).

2. **TIER 2**. The square brown sign signifies that a professional organization such as the Rural Water Association of Utah (RWAU) can assist water system personnel with this extended effort. If they feel they cannot assist – they will recommend that the utility proceed to the next tier (see Tier 3 below).

3. **TIER 3**. The square blue sign signifies that the level of involvement will most likely involve a paid consulting engineer or other similar professional who can more readily assist with the audit and evaluation. These evaluations typically involve much more complex levels of study, and are also likely needed to receive construction funding and or fiscal assistance from programs associated with local electric utilities, etc.

The signs below are added in addition to the 3 above if a special effort is indicated:

A. The orange road construction ahead sign is attached along with one of the above signs, and signifies that the project will likely require some equipment replacement and/or newly constructed facilities.

B. The addition of the yellow high water sign signifies that this project may be much more complex or more difficult than others, and may require more study and other resources. The rewards may be greater however.

C. The dollar sign insertion indicates the project could be more costly than others – but, with the cost high, the savings could be just as significant.

- The Energy Saving Investigation Process -

I. Conservation Related Efficiencies. Energy conservation almost always begins with water conservation, including the process of improved accounting for water losses within the various complex operational systems.

A. Water Conservation. Encouraging water conservation has a direct linkage with energy conservation. Not only does it save energy resources, it also frees up water that can be used as a future (virtual) water source, reducing the dependence on higher prices involved with source development, whether capital costs, water rights costs, or operational costs. Any conservation planning effort should at least look at the following basic strategies and include implementation plans as practical:

1. **The Plan** – Develop a comprehensive Water Conservation Plan and review the relationships between water and energy conservations therein.
2. **Implementation** – Implement ordinances and rules and regulations which affect the strategies and goals contained within the Conservation Plan.
3. **Measure Accurately** - all water use, including separate meters for irrigation and domestic uses, if necessary.
4. **The Standards** – Know what the real supply and demands of your water system are. Know what a typical Equivalent Residential Connection (ERC) uses in a year, an average month, and a peak month and day if possible. Use these standards to compare conservation performance overtime.

5. **Price water to recognize its finite nature** - Pricing mechanisms should provide incentives to water users who conserve water as well as penalties for those who waste it.
6. **Hold Responsible** - all water users for protecting the quality of water resources at their disposal.
7. **Incentives** - Create financial or publicity incentives to reward users for efficient irrigation systems. Key elements to observe are system design, operation, and maintenance, combined with effective scheduling and management practices.
8. **Education** - Create or assist in educational programs, which emphasize to all water users the absolute necessity of supporting regulatory policies, which reward conservative and efficient water use.

9. **Reclaim** - Support water reclamation initiatives if feasible, particularly for irrigation, including the use of reclaimed water from municipal, industrial, and other available sources, where practical.
10. **Prioritize Water Development** - Give increased support to developing new water resources, conveyance, and storage facilities, which enhance dependable water supplies for urban and agricultural use, with proper consideration given to legitimate environmental concerns.
11. **Buy-In** - Participate in water conservation planning as an ongoing program. These plans must be in place prior to a critical need and must provide for each water user's acceptance of a fair share of any water conservation effort.
12. **Manage the Resource** - Institute studies to identify water use and misuse by all segments of the water using industry to provide data on which to base

decisions regarding equitable water distribution during periods of drought or other shortage or water quality event.

13. **Manage the Peak** - Investigate innovative water storage projects, to allow the supplier to better manage its water resources during peak periods of the year.
14. **The Water and Energy Nexus** - Meld Water and Energy Conservation into a unified strategy. Water and Energy share many of the same conservation strategies and should be looked at conjunctively in any conservation program.
15. **Water Loss Reduction Programs** - are very necessary to demonstrate to customers that the water supplier is doing everything possible to minimize water loss on the supply side of the equation while promoting conservation programs to the end users on the demand side.
16. **Legislative Actions** – City or County Landscape Ordinances can save considerable resources when properly applied in the initial project planning and design phases.

B. Water Accountability. Accounted and unaccounted water losses waste significant energy, resources, and money, and can be at least partially remedied through a regular water audit and thorough investigation using the processes below. Most types of water losses fit into one or more of the following categories. Each system should develop a program to regularly or even continually (using SCADA) investigate, quantify if possible, and mitigate as much water loss as possible. (NOTE: leak detection instruments may be required in many of the tests needed for this program). The categories of water loss are:

1. **Unbilled Metered Consumption**:
   a. This is usually a water revenue loss (if the meter is read) resulting usually from a defect in the accounting and billing systems and controls of the utility (also see 5 below).
   b. This can also be a loss from special agreements, judgments, or other special treatment of customers who are metered (at least making a demand reading usable in a water audit - if read).
   c. This can also be a water and revenue loss if the meter is NOT read.
   d. The water utilities own facilities can often fall into this category, i.e. offices, plants, etc.

2. **Unbilled Unmetered Consumption**:
   a. This category consists mainly of forgotten customers, or
   b. Often users that are some of the earliest connections which might be forgotten or were believed to be terminated in the billing system but not disconnected.
   c. Firefighting and other emergency water uses fall into this category.
   d. Again – often the water utilities own facilities can fall into this category.

3. **Unauthorized Consumption:**
   a. This is typically the water thief's, illegal users, or

b. Connections that have been unauthorized in the past and not disconnected.
c. Unauthorized construction water users will often be found here (i.e. a meter by-pass) if not regularly checked up on.

4. **Customer Metering Inaccuracies**. These errors result usually from:
   a. Lack of a meter testing and replacement program.
   b. Meters that are not designed for the particular application or installation configuration.
   c. Meter that are too old, obsolete, or are reaching their end of life.
   d. Meters that are damaged or partially or completely plugged.
   e. Meters that have failed.
   f. Meters that have lost their power source (if applicable) or their electronic read system batteries have been depleted.
   g. Meters damaged or stopped due to freezing conditions.
   h. Meters that cannot be tested or verified to their inaccessible conditions, i.e. in the basement or crawlspace of a home, etc.
   i. Lost meters.
   j. Vandalized meters or reading equipment.
   k. Oversized meters, particularly on services where the meter was designed to handle fire flow demands from a fire sprinkling system.

5. **Systematic Data Handling Errors**. This category is where errors in data processing occurs, namely:
   a. Clerical data entry errors.
   b. Meter data configuration errors, i.e. types, size, units billed, zero multiplier units, etc.
   c. Meters coded to the wrong customers.
   d. Billing system rate entry and testing errors.
   e. Errors or “bugs” in the actual firmware of the reading equipment or the software used for reading equipment and billing.
   f. Errors due to the lack of maintained software updates.
   g. Lack of an accounting control system to review or check up on billing reports, meter work orders, etc.

6. **Leakage on Distribution System Mains**:
   a. Leak detection audits should be performed on a regular schedule, starting with older and less reliable infrastructure.
   b. The establishment of a system typical water loss baseline aids in the identification of new leaks as well as performance of you water loss programs.
   c. Meter performance and testing. A regular testing program should be implemented. Many residential meters have an accuracy curve that drops significantly after 10 to 15 years. As much as a cup per minute or more can pass undetected through some meters. Larger systems should consider purchasing or constructing their own meter testing benches.
   d. Master metering should be provided where practical, when a large user base is fed off of one or two line(s), and mass balance tests

reviewed regularly (supply in, less the summed user meter demands).

e. Fire hydrant leak tests should be performed regularly.

f. Operational leaks, i.e. flushing and testing should be metered and accounted for if possible.

g. Fire department tests – if unmetered, an estimate should be maintained by the fire department and submitted to the utility.

h. Sewer system flushing programs should utilize hydrant meters.

i. Construction water should be metered. Investigate the installation of metered bulk water stations if construction water places a regular heavy demand on a system. This can reduce significantly wear and losses on fire hydrants.

j. Fire hydrant meters should be tested regularly. They fail or can be damaged fairly easily, especially if used for construction water.

k. Can the SCADA system be provisioned to monitor for water losses on a real time basis?

l. Investigate the implementation of automatic PRV pilot adjustment systems which can adjust pressures for high and low demand periods. Lower pressures at low demand periods can reduce water losses on the distribution system.

m. Regularly check for water losses at PRV stations and other distribution system regulation valves.

n. Air-Vac and air release valve stations are an often overlooked source of water losses. Many of these are lost and hidden, but can result in significant losses if damaged from freezing or other problems.

7. Leakage on Service Lines (laterals):

a. If a leak is found on a service line after the meter, due to corrosion or age – there is a very good chance there is a leak on the service line feeding the meter.

b. Know where all service line valves are using maps, GPS, GIS, etc. Most of the time these are covered over by the customer.

c. If a customer has a fire sprinkling system, does it have a tested flow detection system?

d. Know the soil conditions in areas that are prone to leaks.

e. Use service line materials and depths which are more suitable to your environment and soil conditions.

f. Automated Meter Read (AMR) systems can aid in the locations of service line leaks by observing trends throughout the night or unoccupied seasons or times. They can also detect leaks from freezes etc.

8. Leakage on Tanks and Overflows:

a. Leaks in tanks can be found through regular internal and external inspections.

b. On metal tanks – inspect for corrosion and cathodic protection issues. Recoat the tank if necessary.

c. Check for leaks in tank control vaults and valve systems, including tank level regulating altitude valves.

d. Excessive water overflow and other losses in tanks can be caused or remedied by the following:

i. Proper Placement of Reservoirs and PRV's. Keep pressures feeding an altitude valve at a minimum if possible.

ii. If feasible - use PRV's less and reservoirs more for pressure control.

iii. Investigate the use of reservoir inlet and outlet detection devices.

iv. Investigate reservoir emergency or seismic control valves which close to protect storage in an emergency water loss situation.

v. Investigate reservoir overflow detection systems.

vi. Watch for reservoir level transducer failures or improper level calibrations.

vii. Ensure that reservoirs are properly vented and protected.

9. **Leakage within Plants and Equipment:**

a. Check for leaking pump surge anticipator or pressure relief valves which discharge water to the atmosphere.

b. Check for leaking pump control valves (deep well type) which may discharge water to atmosphere.

c. Check pumps for excessive leaks in pump seals.

d. Check for leaking air-vac and air release valves in pump stations and treatment plants.

e. Regularly check for water losses at regulation valves including altitude valves, electric and pneumatic actuated valves, pump to waste PCV's, and PRV's.

f. Ensure that filter to waste cycle times are not overly excessive.

g. Investigate the feasibility of backwash water re-use, either internally or for irrigation etc.

h. Inspect sedimentation, mixing, clarifier, filter basins, systems and the like regularly for leaks, performance issues, etc.

i. Monitor for leaking well foot or other check valves on sources.

II. System Modeling Efficiencies. One of the first steps necessary to the proper development a comprehensive energy audit of a system is to perform an extended period computer model to evaluate the source, distribution, and pumping system(s) functions and performance. While the modeling can be somewhat complex, system personnel and others can assist with the data gathering and mitigation or repairs necessitated thereby. Modeling – particularly "Extended Period" modeling is also a dynamic process which needs to be regularly reviewed and "fine-tuned" as needs arise, new data becomes available, and system conditions change. As a part of this evaluation, the following energy demanding scenarios (among others, such as water quality conditions) should be studied. We begin with the "4-L's", or the primary efficiency modeling "red-flags":

A. **Looping**. The process of unwarranted or repeated boosting of the same water. Ask this question: Could a pump or systems of pumps be boosting water, or any portion thereof in one or more continuous loops? Such loops can be found, among other possibilities, in the following places:

1. In the distribution system piping through inter-zonal connections, where a booster station pumps water from a lower zone to a higher zone, and water can be routed back down (around the booster and back to the suction side) through one or more locations or devices, such as:
   a. PRV stations – where one or more station(s) are designed to be normally closed (open only in very high flow or fire flow situations), but failures occur through:
      i. Improperly maintained PRV's, Failed Solenoid Controls, or Relief Valves and related PRV pilot control systems.
      ii. Leaks in a PRV valve diaphragm or across valve seat.
      iii. Leaks in a standby or larger backup fire-flow PRV.
      iv. Leaks in a by-pass gate or butterfly valve.
   b. Leaking through normally closed zone isolation valves. Often these are also accidentally opened when their purpose is not understood. A normally closed valve should be marked as such in a valve box with an inserted pole, 2x4 board, flag, etc.
   c. An improperly designed or applied PRV station (due to future distribution modifications), which should be kept closed or could be simply eliminated.
2. In pumping stations where failures may occur through:
   a. Leaking pump check valves, when one or more pump(s) are off.
   b. Leaking surge anticipator or pressure relief valves, which discharge to the pump suction zone.
   c. Leaking pump by-pass PRV or solenoid valve systems used to deliver fire return flows from the higher pressure pumped zone to the pump suction zone.
   d. Water cooled chiller or air-handling systems used to cool a pumping plant, where a solenoid or control valve feeding the coils leaks from the higher pumped zone back to the suction side.
3. Source and Treatment Facilities through:
   a. Chemical (i.e. chlorine gas) feed systems or ejection systems, i.e. leaking pump check valves, solenoid valves, etc.
   b. Leaks from corroded or damaged source well pump lines or well columns, where the water flows or circulates back into well casing annular space. This can also involve screen and corrosion issues.

B. **Leaping.** The process of unnecessarily pumping a source, such as a well around (or "leaping" over) a higher PRV separated pressure zone (often through a separate pumping line) to a tank, when the pump would be using significantly less energy by simply pumping the necessary demand pressures (or a portion thereof) directly into the pressure zone in which it is located. The remediation can usually be fully utilized if there are other sources or pumps that can supply the actual higher tank zone. The PRV's are now only used for high flows, emergency backup, or when the well or pumps cannot meet the necessary supply. Leaping can be mitigated by:

1. Well or booster pump station(s) pumped exclusively into hosted pressure zone, with flow controlled by zone pressure, i.e. VFD's or multiple pumps.
2. Well or booster pump station(s) pumped into upper tank zone pipeline only when needed by an automatic diverting valve, but used in lower zone as much as possible.
3. A combination of 1 and 2 above, achieved by adding a separate or smaller pump(s) (or dividing up pumps) to keep the hosted zone in water, with the others used to supply the upper zones.
4. Performance can be monitored by metering the pumps AND the inter-zone PRV's.

C. **Losing Head**. The process of unnecessarily dropping or breaking a usable water supply pressure, which could have been utilized in a local or adjoining zone without the drop. These conditions may be found in the following situations:

1. Breaking a spring HGL pressure pre-maturely or re-pumping a spring unnecessarily.
2. Underutilization of a flowing well, even if it is seasonal in nature.
3. Breaking a high pressure zone in a pumped system – just to be pumped up again to that zone or another higher pressure zone.
4. Remediation of this problem often involves re-provisioning or installing new pipelines to bring the pumping systems into a more efficient condition.

D. **Loading**. The processes involved in the efficient timing and efficient capacity loads and control of pumping systems. If done properly – significant savings can be realized, but if pump operations are random or uncontrolled or not optimized, the costs can be excessive. This problem is remediated as described in sections further down in this document, but is mentioned here because it is often discovered in the computer modeling processes. It is seen in a pumping and energy model by the following:

1. Well and booster pumps which pump a very high flow of water to a tank or user demand zone for short periods of time, i.e. less than 20 percent of the day.
2. Pumping systems engineered for some distant build-out capacity, but the current operational needs are only a fraction of the limit.
3. Pumping cycles which create an excessive head loss on the system.
4. Pumping systems which do not perform in their most efficient pump curve zones, or have an inadequate or poor suction head.
5. Well drawdowns which have changed significantly since the initial pump sizing.
6. Tanks and reservoirs which are sized too small to allow fora custom timed pumping cycle.
7. Pumping systems which model well if run in "off-peak" scenarios, but are not run as such.
8. Pumping systems utilizing an ineffective or efficient electrical rate tariff.
9. Pumping systems which are artificially restricted to control flows, such as valving, etc.
10. Pumps not prioritized and operated by efficiency constraints.
11. Worn or improperly maintained pumps.

III. Water Source (or Supply Side) Efficiencies:

A. To begin with – ask yourself: "Is the source water actually making it to a tank? Does it really need to?"(See "Leaping" above). This can be modeled and monitored in a SCADA system setting.

B. Run sources (or prioritize them) based on energy costs per unit of water (also known as Specific Energy), and choose the most efficient sources first – given water rights and other water quality implications and considerations. This figure would be in a unit such as kWh / Acre-foot, or kWh / MG, or kWh / 1000 Gallons, etc.

C. Monitor well Specific Capacity (standard flow per standard drawdown unit, such as gpm / foot) on a real time basis using SCADA to test for changing well efficiencies overtime or by season.

D. Through a change application process with the State Engineer, determine whether water rights could be transferred from an expensive source to a less expensive one. Or could multiple sources or points of diversion share the same water rights, allowing you to have greater flexibility in how you operate sources.

E. Monitor in real time with SCADA, and log sources and pumping systems for not only Specific Energy, as discussed above, but also Specific Power. This process allows you to see the effect of the demand component of your power bills and take steps to minimize its impact (i.e. should I use off peak, or load factor extension strategies). This calculation is typically expressed as kw / gpm or gpm / kw. This figure, along with Specific Energy, as described above, is also often used to check for the trending of pump efficiencies overtime, and possible needs for well and pump maintenance.

F. Remain current on all water source protection plans and work to mitigate any possible threats to said source(s). Ensure that each source has an approved and recorded protection zone. Work with City or County officials to assist in the adoption of a source protection element to a zoning code or regulation. Losing a source, either temporarily or permanently can cost the public and the environment significantly.

G. Monitor total source production monthly and daily if possible. Tie source capacity to the number of standardized ERC's to establish a running trend of capacity utilized and available, as well as overall efficiency.

H. Well Issues:

1. Well screen maintenance issues creating a greater draw-down than the well was originally equipped for.
2. Excessive VFD Harmonics or inadequate filtering, along with issues associated with excessive cable lengths between the VFD and motor.
3. Improper well power cabling used for a VFD controlled motor.
4. Well pump and/or motor sizing errors or condition changes overtime.
5. Line drive well pumping systems are typically more efficient than submersible pump systems, if the well can be equipped for such and has the proper characteristics.
6. Undersized well casing, preventing more efficient pump and motor selections.
7. Corroded or leaking pump column piping.

I. Spring Issues:

1. Loss of flows due to roots or damaged collection systems.
2. Lack of vegetation control in the spring collection areas.

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IV. Water User (or Demand Side) Efficiencies:

A. Implement increasing block water rates (with many tiers), including possibly surcharges to higher demand customers. Doing this is the first step to actively encourage customers to be more involved in water conservation measures.

B. Investigate zero based rates which provide no water in the base charge.

C. Review the feasibility of high elevation rates or the establishment of high elevation surcharges to assess customers who place a higher pumping demand with related higher energy cost on the system.

D. Review and update the water conservation plans and strategies as necessary (See conservation section above).

E. Review system Rules and Regulations – to ensure that they promote conservation and penalize users for unnecessary water use and waste.

F. Demonstrate resource conservation strategies and water education by participating in or developing annual school water fairs.

G. Provide public education and assistance when possible to help conserve water or find known water losses.

H. Reduce system leaks and water losses by implementing fixed based meter read systems, which read meters daily and hourly. Tie customer water meter reading system to work in conjunction with a carefully implemented master meter system(s). Generate daily reports, pinpointing areas where a water leak or break may be occurring. Use this system to assist customers in troubleshooting leaks on their side of the meters. Provide customers with daily water use statistics on company web pages to promote usage understanding and conservation.

I. Regularly test and calibrate meters and perform regular upgrades as necessary.

J. Follow AWWA Water Audit standards or your own, and perform annual water audits.

K. Consider secondary water system metering, if you provide such, to save higher quality and treated water sources, and helping to avoid the often used term of, “you better use it or lose it”.

L. Consider culinary irrigation metering systems or the metering of pools or large water features, separate from customer meters with large high use customers.

M. Consider ET Irrigation Control Systems, or providing ET data to customers to assist in the programing of their irrigation systems.

N. Provide customer – On-Site conservation and leak evaluations and audits.

O. If you utilize a fixed base and hourly customer meter read system – investigate and consider an additional demand surcharge based on peak daily flows, which have a larger impact on a distribution or pumping system than annual or monthly volume usage (similar to what power utilities do with a demand charge).

P. Investigate installation of real time leak detection monitoring equipment.

Q. Master Meter new developments where practical.

R. Investigate wastewater re-use systems and possible Membrane Bio-Reactor (MBR) scalping plants to facilitate the irrigation of large institutional, agricultural, or private irrigation needs in adjacent areas.

S. Provide optimum lawn watering and irrigation schedules to customers.

T. Implement water theft regulations and provide the policing of such.

U. Provide annual water loss reports to your public and board.

V. Track what a system ERC standard really is, and trend regularly its claim on your water source capacity and water demand capacity.

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W. Understand better what water use is in the middle of night in the winter to estimate more accurately the background or passive water losses, etc.

X. If possible – install meters in the low flow PRV by-passes which are constructed around larger PRV's, and are used more at low water use periods to help establish a system or regional base leakage rate.

V. Pumping System Efficiencies:

A. Pumping system efficiencies are decreased if:

1. The pump is operating outside of its pump curve efficiency range.
2. The pump is worn or not of a proper design.
3. The flow of water is restricted or throttled on the suction (and/or) discharge side.
4. The electrical control system, i.e. VFD is not designed for the application. This is common in high head pumping systems where a VFD controls the whole flow in just a small band if Hz. VFD's are not always efficient in these cases.
5. The Distribution System is not routing and controlling the flow of pumped water properly to its destination, i.e. re-pumping or short circuiting, faulty PRV's, etc. (see Modeling above).
6. Other Distribution System Problems, i.e. storage issues, leaks, corrosion, pipe age and quality, under sizing, etc.
7. Pump station pipe materials and fittings are corroded or tuberculated, increasing the friction coefficients.
8. The electrical Load Factor is too low and the head losses on the distribution system are excessive. Load Factor (LF) is a fractional number or percentage indicating the average amount of time per day a motor or pump runs. i.e. a Load Factor of 0.25 or 25% means the pump runs on average 6 hours per day.
9. The Electrical System Power Factor (PF) is not efficient or too low.
10. The Water System Peaking Factor is too high (above 2.0).
11. The Pumping Systems are not cooled properly.
12. Metering issues, such as old worn meters, no master metering strategy, and no leak detection. Etc.

B. Pump Curves and pump performance should be regularly reviewed and tested. Test each pump on at least 4 points on the curve. Have a VFD curve available if the pump is on a VFD and test at several speed points.

C. If you use the correct utility power rate for your pumping systems, significant money can be saved.

D. If you pump during the designated off peak periods of the Electrical Utility – you can also save money, by completely eliminating or reducing the Power Demand Charge. Proper storage capacity is essential to follow this strategy.

E. If you use Variable Frequency Drives (VFD's) to increase your Load Factor, or use jockey type pumps – you reduce your costs – by reducing your demand and energy charge.

F. If you have a high head loss on a pump plant, a VFD can reduce your energy cost by reducing the total dynamic pumping head.

G. If you are charged a power factor penalty – you can eliminate that charge by implementing power factor correction strategies.

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H. Pump cycles and operation should always be selected for efficiency, yet be prepared for any emergency operation scenario.

I. Always match the VFD to the proper pump and pump curve.

J. Never, ever use a restrictor valve to control the flow rate of a pump.

K. Run pumps more often (prioritize) based on their costs per unit of water pumped, also referred to Specific Energy. If possible - choose the most efficient pumps first in a system for pumping.

L. Carefully develop effective multiple pump rotation and lockout strategies.

M. Provide for pump back-up strategies.

N. Carefully review the necessity for pump trimming when using a VFD. Often the VFD acts as the pump trim.

O. Evaluate multiple and smaller pump designs, vs. one or 2 large pumps in a pumping plant.

P. Review well and pump designs to evaluate if a line drive pump is more efficient than a submersible pump system. Submersible motors are typically less efficient.

Q. Implement SCADA and control system lockouts to prevent operators from running multiple pumps when not needed, or bumping pumps unnecessarily during an on-peak pumping period.

R. Provide engineered pressure and surge protection systems to better protect distribution infrastructure and pumps from wear, breaks, leaks, etc.

S. Typically small jockey type pumps should run first and as long as possible to extend the load factors as much as possible. A load factor above 80 % is not unrealistic, in fact it is preferred.

T. Regularly evaluate for service or replacement any old and worn pumping equipment.

U. Provide or specify motor shaft grounding brushes to protect bearings on VFD operated pumps.

V. Use high performance lubricants on motors for extended performance and lower operating temperatures, and maintain levels.

W. Well “pump to waste” cycles typically run pumps at their highest energy and power demands. Provide aback pressure or pressure sustaining valve in line with the pump control valve, or add a sustaining pilot on the pump control valve, to hold waste discharge pressures closer to the efficiency point on the curve. Ensure that these valves are not oversized. They should provide a significant back pressure simply as a function of their size. An alternative for a VFD controlled pump would be to run the waste cycle at a lower speed.

X. Evaluate your pump exercise and water testing strategies. Avoid running a pump for a short period just to exercise it. If a pumping system needs this, evaluate running it in an off-peak period or on a generator regularly. The same applies to running well pumps for a simple water test, when they would normally be idle for a month or more.

Y. Ensure that your well and well pump performance matches its design characteristics and pump curve. Also monitor well static and dynamic drawdown and specific capacity over time. If there are irregularities – the pump may be worn, or the pumping column may be leaking into the well annular space. When changing or servicing well pumps, perform a video inspection to ensure that the well casing is in good condition. A corroded or malfunctioning casing and screen system will restrict flow into the well casing and lower drawdown levels, thus increasing energy and power requirements.

Z. In summary, implement water pumping and operational management strategies similar to the following:

1. Reduce Energy usage on pumping facilities by ensuring that pumps are not running at a level or in a configuration which increases head losses in the pumping or piping systems.
2. Eliminating a possible return flow loop or leak in a pumping station through relieve/surge anticipator valve(s) or emergency fire flow PRV's.
3. Review pump curves to better limit Variable Frequency Drives (VFD's) to their optimum frequency range settings.
4. Avoid "across the line" starters for motors where possible. Reduced Voltage Soft Starters (RVSS) and VFD's are usually better, depending on the application, and offer far better motor protection strategies.
5. Monitor temperatures and environmental variables better in all pumping and other remote facilities to get better controlled energy use for heating and/or cooling. Use Motion detectors for lighting controls and install more efficient fluorescent (T5 or T8) or LED lighting.
6. Evaluate and implement better and more efficient cooling systems for the larger pumping facilities, to not only save energy but extend pump life.
7. Improve the efficiency and reliability of larger HVAC heating and cooling systems by, monitoring air pressures, humidity, and other parameters. And to better control operation in the winter months, using the heating systems only when needed. Integrate HVAC controls into PLC's and integrate with system SCADA equipment. Investigate using the water itself for cooling and heating (i.e. Water Furnace technology).
8. Ensure where feasible, that pumps controlled by Variable Frequency Drives (VFD's) do not have their impellers trimmed – thus allowing fora wider range of operational flows and pressures.
9. Large pump motors should be wound with RTD's (temperature sensors), and associated motor protection relays, to better monitor motor winding conditions.
10. Establish Power Quality meters on larger facilities with daily SCADA logging capabilities.

VI. Storage System Efficiencies:

A. Know all tank dimensions, including elevations of floor and overflow.
B. Verify tank capacities and the capacity per foot.
C. Know the equalization, fire, and emergency levels and capacities.
D. Know your tank rate of changes +/- at all times with the SCADA system.
E. With this information, make informed decisions, instead of relying on the classic "saw tooth" decision, for leaks, etc.
F. With our unique ability to store water in tanks, we should think more of a tank as an energy storage battery, and utilize it and run pumps as such.
G. Storing Water is very similar to storing energy, which in turn allows us:
   1. The ability to run high energy and power motors and other equipment at controlled rates, and
   2. During controlled periods of time.
   3. This is unique in the world of commercial and industrial power users.

H. Size all new tanks for:
   1. Required ERC Demands as per State DEQ Standards, plus
   2. Fire and Emergency Storage, plus
   3. Energy Storage volumes (for Off-Peak Pumping) if possible.

I. Inspect and clean all reservoirs regularly, check for leaks and security issues.

J. Have a reservoir back-up plan in case a reservoir needs to be taken down, w/PRV's, pressure regulated pumps on VFD's, etc.

K. Install backup floats in reservoirs in case of transducer failures.

L. Investigate possible ASR (Aquifer Storage and Recovery) projects to reduce the Seasonal Peaks, and better optimize the usage of water sources or treatment facilities.

VII. Distribution System Efficiencies:

A. Ensure that all PRV's are properly maintained and tuned to provide optimum pressure levels which may in turn reduce accompanying distribution system water losses.

B. Review fire hydrants annually and test for possible leaks.

C. Keep a centrally accessible and well-maintained set of pipe location and leak detection instruments to ensure rapid and accurate assessments of infrastructure.

D. Investigate installing a centrally located and efficiently accountable bulk water filling station for construction water – minimizing water losses and unauthorized use by contractors.

E. Develop and implement a distribution system flushing program to ensure that water quality is maintained as well as friction losses minimized and water quality is optimized.

F. Review and maintain key air-vac and air release devices in the distribution system to ensure that they are functioning properly with no build-up of air. This will maximize flow of water and can significantly decrease energy demands. Ensure that high points of distribution piping have air regulation devices. Even a partially air locked pipe can use significant energy in pumping.

G. Where practical, install customer services in the top zone of distribution piping (and at pipe high points) to ensure air is kept out of the piping systems, and reduce the need for air-vac devices.

H. To optimize energy efficiency on any raw un-treated water transmission lines – implement pipeline pigging programs to ensure that pipe wall friction coefficients are maintained at a minimum, thus reducing pumping energy costs.

I. Model the distribution system using a steady state AND extended period models, to evaluate possible undersized piping systems and networks, including water flow patterns, water quality characteristics, and energy demands over different scenarios. (See Modeling above).

J. Test water for possible tuberculation and corrosion (iron and sulpher reducing bacteria, and langler index) issues which can impose energy inefficiencies.

K. Be careful not to crush PE piping in new piping installations.

L. Investigate the installation of real time pressure transducer monitoring at key distribution sites and use the data to calibrate system models.

M. Implement and monitor Backflow testing programs to protect water quality, and ensure that these protection devices are not leaking.

N. Check the distribution system(s) for partially closed or lost isolation valves. Know the valve rotation counts for various diameters of pipe. Verify these diameters with the piping models and record drawings.

O. Investigate pipe network looping and additional network upgrades in the system to reduce head losses on pumping systems, etc.

P. Specify pipe materials which have a higher "C" coefficient in future upgrades or expansions.

Q. Incorporated pressure management PRV control valve systems where practical. These systems can drop the pressure from say, 110 psi to 70 psi during low demand periods, which helps to reduce water use and lower the leak rates. It also limits the wear and tear on the water system. But when higher flows are needed in that zone, the pressure automatically increases to the higher pressure for such use as fire-flow or heavy demand. When demand subsides, the valve automatically returns to the lower settings.

R. Develop an upgrade plan for piping systems which are deficient in size, materials, or quality.

VIII. Plant or Treatment Facility Efficiencies:

A. Upgrade key chlorinating disinfection units to more efficient systems, utilizing less energy either in production and/or transportation and handling of product.

B. Investigate chlorine generation systems. We live in a State with accessible and cheap salt deliveries, making the electrolytic generation of chlorine much more efficient.

C. Implement more natural and energy efficient systems to reduce algae growth in raw water systems, which could reduce the costs and amount of chemicals used for treatment.

D. Improve treatment plant process control and efficiency through proper utilization and dosing of chemicals to reduce chemical waste, etc.

E. Improve chemical storage to increase bulk purchase discounts and reduce delivery frequency thus saving energy and costs.

F. Monitor electrical facilities for inefficient heat dissipation or cooling, through increased building insulation, etc.

G. Use more efficient lighting in plants (i.e. T5 Florescent or LED).

IX. Technology and SCADA Efficiencies:

A. Key to the operation of a successful advanced energy management strategy is the close and persistent review of pumping and energy data. While many SCADA systems are adept at general plant operations, an advanced system requires more analysis of the situations at hand, and must make more complex decisions, as well as provide more comprehensive reporting and alarming features. We call this SCADA 2.0. Presented below are some of the SCADA 2.0 process and related control strategies:

1. **Typical** - SCADA operation based on the usual reservoir set points
2. **Off Peak Mode** – Run everything off-peak if reservoirs allow (can eliminate power charge – Rocky Mountain Power(RMP) Rates 6B, 8, 9, or reduce energy charge – Rate 6A).
3. **Off Peak - Load Factor Mode** – Run everything off-peak if reservoirs allow, but pump the entire off-peak period at lower flows (can eliminate power charge – RMP Rates 6B, 8, 9, AND reduce energy charge for all rates.)

4. **Load Factor Mode** – Fill the entire day with as few of pumps as possible (or run smaller pumps) or reduce Hz on VFD's (can significantly reduce energy charge AND power charge).
5. **Efficiency Failover Mode Option** - If #2 or #3 fails – then switch to #4, Additional Option - If #4 fails –then switch to #1.
6. The SCADA system reviews continuous pump efficiency, with GPM per KW, and Gallons per KWH (or KWH per MG), as well as Power Factor monitoring data and presents historical trend charts and alerts. (Note: some power and energy monitoring equipment upgrades may be necessary).
7. Provides detailed reports to alert for possible water loss, problems, etc.

B. Implement energy and power monitoring reporting (i.e. Specific Energy and Power) into the SCADA system to better monitor the performance of pumping systems. This will allow for more rapid reporting of pump failure or blockage by rocks or debris in an impeller or impeller wear, significantly reducing its efficiency, or motor malfunction.

C. Through the proper implementation of an Asset Management system and a GIS system – provide geographically accurate infrastructure information and maintenance history to empower staff with the data necessary to make timely repairs, reduce travel, and improve maintenance decisions.

D. Have proper power backup generators and equipment available so key infrastructure can be operated in an emergency. Backup all SCADA, security, and critical control systems at key locations using a small backup generator and/or UPS system if necessary.

E. Move more critical computer server applications into the "cloud" as they become available and more mature, reducing local costs of hardware management, software maintenance, as well as energy costs, as well as providing better data backups.

F. Install "water bug" type water leak detection devices on all SCADA sites to enable staff to react quickly to any type of facility leak or water loss promptly.

G. Develop and practice backup procedures for failed SCADA system(s) (i.e. communication loss plans), etc.

H. Basic SCADA reports:
   1. Daily Consumption – net reservoirs, etc.
   2. Hourly Consumption as above.
   3. Pump performance data.
   4. Power quality data.
   5. USE the SCADA data gathered efficiently and properly.

I. Important SCADA Efficiency Data to gather at plants and umping facilities:
   1. Amps
   2. Volts
   3. VAR's
   4. Kilowatts
   5. Kilowatt hours
   6. KVAR hours
   7. Power Factor
   8. THD
   9. Well drawdown
   10. Well Specific Capacity Calculation; gpm / foot

11. Specific Power Calculation; Kw / gpm or MGD
12. Specific Energy Calculation; Kwh / gallon or KG or MG
13. Rate cost data - What does a pump cost per day, month, year, etc.?

J. Tie real time SCADA data into a dynamic water model.

K. Tie real time SCADA data into an asset management or work order system, where work orders are issued automatically based on equipment run metrics, i.e. run hours, gallons pumped, etc.

L. Record system pressures at key points and in PRV stations, etc. See real time performance in emergencies, pipeline breaks, etc. pinpoint trouble areas for potential cross connections, etc.

M. Provide higher levels of infrastructure security and intrusion detection. Use IP video in high risk areas.

N. Using the above data and resources - predict areas for future improvements and repairs.

X. Internal or Operational and Behavioral Efficiencies: This section describes energy efficiency strategies that can simply be achieved by management or operation changes in the way we function in the workplace. Many of these strategies require very little money or effort to achieve a savings.

A. Sustainability - Review State and EPA Standards for capacity development in the following areas and implement the standards:

1. Managerial Capacity
2. Financial Capacity
   a. Effective Rates
   b. Impact Fees
   c. Levels of Service standards
3. Technical Capacity

B. Train and Educate – Provide training opportunities for administrative, office, and operational staff at regular intervals. Ensure that all personnel are certified at levels at least at their required proficiency requirements. The Rural Water Association of Utah and the State Division of Drinking Water offer many courses and testing opportunities.

C. Administrative:

1. Know who to call when help is needed. Have a ledger distributed to all departments of who to contact in an emergency or if technical assistance is needed. Again, the Rural Water Association of Utah and the State Division of Drinking Water have resources in place to help with any type of problem or assistance needed.
2. Develop a realistic capital improvement program to replace old systems with more efficient systems.
3. Implement efficient Utility Billing and related financial data systems.
4. Develop sound emergency management programs, including redundant communication systems for SCADA and personnel access.
5. Join the UT-WARN cooperative agency to provide resources in an emergency or other problem.

6. Implement Asset Management Systems for:
   a. O&M
   b. Capital Improvements

D. Operational:

1. In large utilities, distribute operational personnel where practical. Create possible small satellite offices or shops and equipment stores, with SCADA access to more efficiently position operation staff across the service area.
2. Train operators regularly in the efficient and proper diagnostic procedures used to determine system water losses.
3. Reduce paper output by providing work orders, system maps, O&M manuals, and system photos digitally to remotely accessible computers and mobile devices (iPads, smartphones, etc.).
4. Optimize and centralize spare parts and other inventory in key locations to reduce energy and time related travel needed for the proper operation and maintenance of the systems assets and services.
5. Ensure that all operations and management staff have reliable access to SCADA, security systems, and server data and resources to minimize the amount of travel need to check systems in person.
6. Encourage telecommuting with certain staff where practical.
7. Compile and regularly train with employees or operators "Water Operations Manuals" or "Standard Operating Procedures" (SOP's) – compiled with emergency and energy management procedures, etc.
8. Practice "table top exercises" and drills and tests, etc. in company operation and emergency procedures.
9. Teach operations staff to be creative and innovative, and provide new ideas and designs. Reward for such.

E. Office Facilities:

1. Implement Energy management strategies in water system offices – i.e. programing thermostats effectively and using low energy lighting, motion controlled light switches, etc.
2. Install a backup generator for the administrative office if needed.

F. Public Relations and Education:

1. Make the system's WEB Page more public friendly, usable, and efficient.
2. Education (start early to instill a conservation ethic in children):
3. Conservation Resources
4. Water Fairs
5. Back-flow and cross connection prevention
6. Groundwater protection
7. Conservation Garden(s) and xeriscaping displays
8. Public Educational Press Releases
9. Educate the public to assist in the recognition of a water leak, possible security breach, or water theft, etc.

G. Materials and Equipment Recycling:

1. Recycle paper and other appropriate office items. Provide accessible bins for such purposes.

2. Recycle used metal scrap, copper, brass, (meters) and bronze, from old water facilities, equipment, and meters.
3. Re-use older electrical and water distribution equipment where feasible.
4. Recycle all SCADA and UPS system batteries.
5. Recycling programs for pipe, copper, brass and other materials
6. Implement the proper re-use of used materials in bone yards, etc.

H. Fleet and Transportation:

1. Reduce fuel usage by operations staff through the proper implementation and use of a field accessible customer service order, asset management system, and inventory control system. This will significantly reduce the need to return to the office frequently to gather work orders, directives, etc.
2. Procure more energy efficient vehicles and equipment in system operations.
3. Investigate CNG conversions for viable equipment.
4. In very large systems, investigate the use of GPS tracking on company vehicles to assist in the most timely and efficient dispatch of personnel to customer needs or equipment problems.

I. System Regionalization Efficiencies:

1. Can provide some economies of scale.
2. Allows for the shared source and storage facilities and extends capacities.
3. Lower staffing levels per customer.
4. More efficient use of heavy equipment and repair parts inventories.
5. Regionalizing can sometimes be inefficient regarding energy due to the interconnection of systems that were not designed for such.

XI. Energy Supply, Timing, Control, and Backup Efficiencies: NOTE: much of the data gathering and work field necessitated by this section should be performed by qualified personnel, who are adept at electrical safety and arc-flash procedures:

A. Carefully select the appropriate utility energy rate for the pumping application (See section XII below).

B. Pumping Selections should be based on unit water costs. Know the Specific Power cost per ac-ft/year, mgd or gpm. Also know the Specific Energy cost perk-gal, ac-ft, or mg.

C. If it is not an emergency - make all motor operation selections for efficiency rather than economy.

D. Evaluate Conventional vs. Off-Peak Pumping in systems using the following criteria:

1. Electrical Power systems size power generating and delivery systems using the same concepts of a water system.
2. Power plants are sized to meet the peak daily energy and power load of their users, even if fora very short time.
3. The art of energy conservation is based on reducing the overall peaking factor of a system, thus reducing peak generating demands, brown outs, rolling blackouts, and minimizing the carbon footprint of a power system.
4. The SMART energy grid is an attempt to reduce adverse peaking impacts.
5. Peak water demands like power deliveries are the most costly.
6. Peaks require the greatest usage of resources.

7. Peak demands rob a system of customer growth capacity – whereas reducing the peak through conservation allows for the economic servicing of more customers with fewer upgrades.
8. Peak demands increase O&M on a system.
9. Peak demands also have a greater impact on the environment.

E. Evaluate the pumping plant Load Factor – using the following criteria:
1. Load Factor is a measurement of the amount of time a facility runs during the billing cycle or during the average day. A large part of an electrical bill is the demand or peak power charge, and if a pumping system runs at a high capacity for a short time – the peak power (kw) charge is assessed – on as little as a one minute pumping period.
2. The Load Factor (LF) on a pumping system also has a big impact on monthly power rates.
3. If the pumping system can run longer – say 80% or more of the time, at a lower capacity – the same amount of water is pumped during a day or month, but the peak power charge is much less.
4. LF is expressed as a fractional number or a percent (%), where 100% means the pumps run 24/7. 50% means they run half of the time during the billing period, average day, etc.
5. Most pumping facilities are designed inefficiently to run for short periods normally, around 25% LF or less, and cost considerably more to run.
6. They are also designed so longer run periods are saved for emergencies or build-out.
7. A VFD can have a big impact on Load Factors if run correctly, and can save on motor maintenance and efficiency as well.
8. A small jockey type pump or pumps can also increase the Load Factor.
9. An ideal Load Factor would be 80 percent or above.

F. Low Power Factor (as opposed to Load Factor), which is caused by an inefficient pumping system can also significantly increase electrical inefficiencies and may result in an electrical utility penalty. The power factor decreases as more reactive power is utilized in a system (VAR's). Reactive energy can be reduced generally by adding capacitors to a circuit or utilizing VFD's.

G. Energy Savings and a VFD:
1. Besides saving Power in a pumping system as previously explained, VFD's can also be utilized to save energy (kwh). This can be a significant savings in some systems.
2. Many pumping systems are pumping too great of a flow in a restricted piping system and the head losses can be significant, i.e. improperly sized pump to pipe system.
3. Other pumping systems are using a valve to restrict the flow in a pumping system to accomplish the above.
4. Imagine driving down the road at 100 mph, and while keeping your foot at the same position on the accelerator, stopping or slowing down your speed with your brake. You consume the same amount of energy but instead of using it, you are burning it up in your braking system.

5. This is similar to the energy losses in a system that restricts flow with a valve.
6. A VFD can save considerable energy by replacing the valved system or restricted distribution piping. It can run pumps fora longer period at a lower flow (similar to the power savings above).
7. This solution can result in energy savings as well as power savings.
8. VFD's do not ALWAYS save energy however, and are not always ideal for some pumping systems, namely high head systems which have a large static head to overcome.
9. VFD's can also add extra heat to a pumping system.

H. Soft Start's or Reduced Voltage Soft Starters – (RVSS) can be a viable alternative to a VFD, where a VFD is not an efficient alternative. RVSS reduce the peak loads and stress on a starting pump, and also contain valuable motor energy and power data, which is useful in an advanced SCADA monitoring and control system. They also run cooler and can significantly outlast an across the line starter.

I. Regularly review plant Wire to Water Efficiencies.

J. Test for Harmonics on VFD pumping systems and remedy with properly sized filtering systems. Many newer VFD's come with these features.

K. Ensure that plant motor and VFD equipment is properly and efficiently cooled.

L. Have a Back-up Power System program and optimize any generator efficiency. Conserve potential generator use. Generators should start remotely, based upon one of the following selector switch positions in the control system:

1. Auto Lock Out - meaning that the generator fuel will not be used,
2. Auto Start in Outage - meaning that the generator will switch on whenever the power goes off, and
3. Auto Start Pump Call - meaning that the generator fuel will only be used when the reservoir calls for water, and the generator will automatically shut off when the reservoir is full. This is designed to conserve fuel during emergency situations. Diversify generator fuels, with some using diesel fuel, and some using natural gas and propane. Have a diversity of types, stationary and mobile, and do not oversize them. VFD pumps take less starting capacity. Some starting capacity can be saved by starting at shut-off heads against a closed valve.

M. Utilize Solar Cells and battery (UPS) on SCADA systems to keep the data transmitting during a power outage and protect security.

N. Implement security systems to protect water quality and quantity.

O. Incorporate energy management and operation of back-up systems into your emergency preparedness and response systems.

P. Investigate using a small solar powered DC/AC well for long term emergency water (if only 1 gall per person per day), with portable tank if needed. A 10 gpm well, run for 12 hours per day will supply 7,200 people.

Q. Provide a good backup supply of key equipment to promptly implement repairs and save water, i.e. transducers, SCADA equipment, pumps, valves, repair parts, etc.

R. Provide advanced Power Quality Monitoring equipment at pumping plants (on either a per pump basis or per plant) to assist in the diagnosis of pump problems, etc.

S. Perform regular Infra-Red (IR) camera tests on electrical facilities to determine any potential thermal electric problems with motors, transformers, breakers, electrical connections, etc.

T. Building and plant design and energy efficiency.

1. **Insulation**. Concrete is not a good insulator in and of itself. Insulate the outside buried portions with protected insulation. Where above ground, insulate the inside.
2. **Lighting**. Review HO T5 and LED lighting options. Standardize on one system. Skylights can be valuable in certain situations. Security may be a concern with these however.
3. **HVAC** – This can be very significant. Electrical resistive heating systems can often have kilowatt loads higher than even some of the pumping systems (3-20kw per heater!). If this is the case – seriously look at other alternatives for heating and/or cooling. A small loop of water run through a coil and supplied around a pump system can supply significant cooling potential, and even possibly some geothermal heating solutions. Review shallow geothermal (sometimes referred to as geo-exchange) options where you use the water itself for heating and cooling - see the water furnace systems at www.waterfurnace.com for some ideas. Review solar thermal systems for day-time heating. These can be coupled with geothermal systems as well.
4. **Humidity** - Moisture from condensation can be a problem, especially if a pump or plant air is overheated. Review economical humidity control systems. Proper ventilation can be important as well. Air heat exchangers can be used in some situations.

U. Keep all electrical and control equipment clean.

V. Keep accurate records for daily, monthly, and annual water use at source and demand facilities, also calibrate to correspond to energy billing periods.

W. Large energy accounts should be subscribed with the power company for on-line access, for daily review, reports, etc.

X. If you use off-peak power strategies, check utility energy meters regularly to ensure that they are synchronized with the correct time. Always leave a small time buffer on your start and stop times.

Y. External Energy Service Provider Strategies:

1. Ensure key facilities are accessible to outside utilities in all seasons to guarantee that meters are read in an accurate and timely fashion and not estimated. Estimates eliminate much of the benefits to off-peak strategies or low load and high load factor strategies.

2. Perform regular utility bill audits. Record and log power and gas consumption data as needed to ensure accuracy in billings as well as facilitating reliable budgetary projections.

3. Graph energy and gas use to demonstrate success of conservation and management strategies.

4. Eliminate small unnecessary or redundant electrical accounts – replace with solar systems if and where feasible.

5. Investigate net metering opportunities on smaller accounts using solar, wind, or energy recovery generation devices or other similar and authorized equipment

Z. Investigate the Rocky Mountain Power (RMP) Watt Smart program for possible incentive funding of energy saving and management projects. This requires an analysis – performed and funded by a RMP authorized consultant, but if areal and verifiable energy savings can be obtained, the Watt Smart program will provide financial assistance to achieve the same. These projects can provide a significant savings on high energy projects such as pumping systems as described in this document. Any energy saving project you anticipate should be reviewed with your RMP customer service representative prior to its design and implementation.

AA. Potential energy sources and Net-Metering opportunities:

1. Natural Gas / Propane:
2. Diesel with proper air quality equipment
3. Solar Electric
4. Solar Thermal
5. Geo Thermal
6. Wind
7. Energy Recovery at PRV's, i.e. Small or Micro Hydro, etc.

XII. Energy and Power Rate Dynamics. This section describes many of the key energy and power tariffs, regulations, and operational opportunities available to Rocky Mountain Power (RMP) customers. These regulations may be similar to those water utilities which are supplied by local Municipal Power Systems. Check with their local tariffs and regulations to properly review any differences.

A. Commercial tariffs commonly used in the water supply industry (NOTE: Rates can be changed, but not more than once per year):

1. **Rate 23** – Small Commercial – low demand < 30kw, this is typically the highest unit cost rate for water production.
2. **Rate 6** – Commercial – medium demand < 1 mw (most common pumping rate).
3. **Rate 6A** – A commercial time of day energy rate. If you have a low load factor – you can save on this rate. It also has an off peak rate built in to it.
4. **Rate 6B** (see note *) is the Rate 6 power time of day off-peak rate.
5. **Rate 8** – Large commercial / industrial rate > 1 mw. Slightly lower rates but the off-peak period DOUBLES in the summer months from 8 hours to 16 hours per day!
6. **Rate 9** – Large industrial transmission rate. Should be considered if loads are consistently above 1-2 mw. Considerably lower rates and off peak periods are the same as rate 8, but you need to take the service from a transmission line at the high voltage side, 46kv and above, and you must construct, own, and operate a sub-station.

7. **NOTE** *: Rate 6B has a 12 month averaged minimum Kw (look-back) – prior to the 6B Election. Be careful and practice for a year before electing this rate (try to get on-peak loads as low as possible)! OR –start a new facility with this rate if you are going to go Off-Peak.

B. Off-Peak Power periods:
1. 11:00 PM to 7:00 AM all year
2. All day on weekends and major holidays.
3. For Rate 8 and 9 Customers they are:
4. 9:00 PM to 1:00 PM in the Summer Months, and
5. 11:00 PM to 7:00 AM in the Winter Months.
6. All day on weekends and holidays
7. Summer months are May through September
8. Remember that you lose most of the power demand savings if you go on peak for even a minute (except Rate 6A).

C. Off-Peak Considerations and Implications:
1. Beware of Rate 6B –with Great Savings comes Great Responsibility.
2. Carefully control water source tests or pump exercise schedules.
3. Check power meter clocks at least annually and provide a small time buffer in your run schedules.
4. Study the Rate Tariffs REGULARLY! They change without notice.
5. Understand the fine print in the tariffs regarding the "Daylight Savings Time" Challenge! This requires several more schedule changes than you think because RMP still programs their meters using the OLD Daylight Savings Time annual schedules. A mistake here can be costly. The current wording is as follows: "Due to the expansions of Daylight Saving Time (DST) as adopted under Section 10 of the U.S. Energy Policy Act of 2005 the time periods shown herein (Off-Peak) will begin and end one hour later for the period between the second Sunday in March and the first Sunday in April, and for the period between the last Sunday in October and the first Sunday in November."

D. Larger User Implications. The Off-Peak rate for rate 6 and the rates 8 and 9 look similar, but the following needs to be remembered:
1. The Off-Peak periods for the number 6 rates (6A and 6B) can never go more than 8 hours per day.
2. The Off-Peak periods for the 8 and 9 rates go to 16 hours per day in the summer.
3. Many pumping systems may need to go partially ON-PEAK in the peak months to meet the daily and monthly demands of the system when the limitation is only 8 hours per day.
4. If you have the ability to use 1 MW – you may want to consider a forced change to Rate 8 (pay a large power penalty at first) to enjoy the benefits of a longer off peak summer period (study carefully). This trick would need to be done at least once annually, preferably in the winter months before May.
5. The extended off peak period makes the savings for rate 8 and 9 larger than may appear, since the Off-Peak periods will likely be maintained in the peak months.

E. A Conservation - Savings Management Cycle (The greater the effort – the greater benefit):
1. **Easy** – If you have low LF, (<50%) move to rate 6A.
2. **Moderate** – Stay on rate 6 and Increase your LF or pumping efficiency by:

a. Managing your control scheme better (SCADA)
b. Installing VFD's on pumping systems (RMP may help pay!)

3. **Harder** – Move your rate to 6A and shed your energy loads to Off-Peak periods.
4. **Hardest** – If you are a large user –Move to rate 8 or 9 and go Off-Peak as much as is possible. Use high pump loads Off-Peak and reduce loads On-Peak – with large Load Factors. And investigate ASR and Energy Recovery.

F. The Energy Rate and Load Factor Dynamic:
1. Rate 6A is more economical fora low Load Factor (<50%).
2. Rate 6 or 6B is more economical fora higher Load Factor (>50%).

G. Estimated utility energy reads (where a power utility cannot read a meter due to access or weather conditions) can kill any off peak pumping strategy. They do not account well for uses at differing periods of the day. They also can have an impact on high load factor strategies. If this becomes common, particularly in the winter months, see if a continuous remote read system is available from the utility. It may cost a little more a month but the savings can be much more significant.

XIII. Engineering and Design Efficiency Goals:

A. Ensure that all new water storage and pumping facilities are designed and sized with off-peak pumping demands in mind.
B. Study potential ASR programs (Aquifer Storage and Recovery), including possibly other similar groundwater programs to reduce the peak pumping and treatment load on the company facilities in the summer months.
C. Study other possible major surface water storage projects to reduce the peak capacity of secondary systems if applicable.
D. Study where hydro-electric energy recovery may be implemented at large pressure reduction locations or other storage locations. Situate key PRV's near power infrastructure if possible. Also – locate PRV's in plants or pumping stations if they are adjacent to the same.
E. Investigate the possibility of incorporating wind and/or solar energy systems to facilitate net metering opportunities near plants or other facilities.
F. With mature GIS data – computer model the distribution systems to find areas or facilities that may be inefficient of undersized, decreasing possible water losses and pumping demands.
G. Provide workable and dynamic water models to staff and train in the proper use thereof, i.e. EPANET systems.
H. Study water sources and pumping facilities to find the actual energy and power costs per acre foot or MG. The company can then develop a strategy to pump water from more efficient pumping systems and also shut down or mothball facilities that are inefficient or redundant.
I. Make the SCADA system smarter. Monitor areas for real-time water losses and pressure changes.
J. Model the system to test for efficiencies in pumping, distribution, and storage systems.
K. Automate meter reading and billing systems, upgrade meters if needed.
L. Choose the correct power rates for each service and design the facility for such.
M. Enlarge water storage systems if possible (require more of new developers).

N. Pump OFF-PEAK as much as practicable.
O. Improve the water distribution system where needed.
P. Design pumping plants with more and smaller selectable pumps and motors, or with larger motors on VFD's.
Q. Consider a Seasonal 2 Stage pumping system with smaller pumps in the winter and larger pumps in the summer.
R. Use a VFD rather than a restricting valve – or change out the pumps.
S. Increase sizes of transmission lines or loop distribution lines if pumping head is too high on a pumping plant.
T. Correct power factor on accounts that are penalized.
U. Investigate the Industrial Rate 9 feasibility on large projects.
V. Implement a regular water and energy audit program.

XIV. Definitions of Terms Used in this Document:

Acronyms	Meaning
A/C	Air Conditioning
AC	Alternating Current
ac-ft	Acre Feet (a volume of water covering an acre of land a foot deep (43,560 cubic feet)
ASR	Aquifer Storage and Recovery
AWWA	American Water Works Association
C	The discharge coefficient used in the Hazen Williams equation of flow (the higher the C value the higher the flow through a pipe)
CNG	Compressed Natural Gas
DC/AC	Direct Current / Alternating Current
DEQ	Department of Environmental Quality
ERC	Equivalent Residential Connection
ET	Evapotranspiration
gal	Gallons
GIS	Geographic Information System
gpm	Gallons per minute
HGL	Hydraulic Grade Line
HVAC	Heating, Ventilating and Air Cnditioning
Hz	Herz (a measure of the cycles per second – used with electrical equipment)
IR	Infrared
k-gal or KG	1,000 gallons
kw	Kilowatts – the primary unit of Power
kwh	Kilowatt Hours – the primary unit of Energy usage.
KVAR	1,000 VAR's. See VAR below
KVARHr	The portion of energy usage attributed to reactive energy.
LF	Load Factor (the measure of a time a facility runs during a billing cycle)
mg or MG	Million gallons
mgd	Million gallons per day
O & M	Operation and Maintenance
PCV	Pressure Control Valve
PE	Plain End or Professional Engineer
PLC	Programmable Logic Controller
PRV	Pressure Reducing Valve
RMP	Rocky Mountain Power
RVSS	Reduced Voltage Soft Starters
SCADA	Supervisory Control and Data Acquisition (Water system operation automation)
SMART Energy Grid	A method by which energy suppliers can monitor and control energy loads, such as reducing AC loads during the peak periods of the day.
THD	Total Harmonic Distortion
UPS	Uninterruptible Power Source
VAR	Volt-Ampere Reactive, a unit of reactive power in an electrical system. Reactive power exists in an AC circuit when the current and voltage are not in phase.
VFD	Variable Frequency Drive

3. Funding Opportunities

A. Drinking Water Board The Drinking Water Board administers the State's Revolving Fund which provides financial assistance to public drinking water systems for water project construction. The Division of Drinking Water (the Division or DDW), acting as staff to the Drinking Water Board (the Board), provides oversight to the Drinking Water State Revolving Fund (DWSRF) financial assistance program. The DWSRF provides financial assistance to public water systems for planning, designing and constructing improvements to drinking water system infrastructure. This section of the Guidance Document provides an overview of the DWSRF application process.

The application for financial assistance, for either planning or design and construction projects, is available from the Division's internet web site at: http://www.drinkingwater.utah.gov/documents/engineering/Utah_SRF_Application.zip.

The Drinking Water Board meets at least six times per year. A schedule of upcoming meetings, along with application deadlines, is also available at this web site: http://www.drinkingwater.utah.gov/documents/engineering/SRF_schedule.pdf.

The completed application must be submitted to DDW prior to the deadline for the specific meeting you wish to attend, as listed in the schedule. A complete application is a critical part of an accurate evaluation. Please be sure to fill in each section of the application with as much information as possible. Division staff are available to answer any questions about the application, the application process, or the DWSRF program in general.

Division staff will review the application and evaluate the project to determine its feasibility. A major part of the evaluation focuses on affordability and staff uses financial information provided by the applicant to determine an appropriate financial assistance proposal to present to the Board. Under specific circumstances an applicant may qualify as a "disadvantaged community" and may therefore be considered for subsidies under the DWSRF program. These subsidies can take the form of a lower interest rate and/or grant/principal forgiveness, either of which will lower the overall cost of borrowing money to complete the project.

Once financial assistance has been authorized by the Board, staff works with the applicant to meet the requirements to close the loan and make the money available for construction. The loan closing process is extensive and can take several months to complete. This timeline must be taken into consideration when a water system is planning a project.

A more detailed overview of the state's Financial Assistance Programs is available here: http://www.drinkingwater.utah.gov/loan_program_intro.htm.

B. Utah Office of Energy Development The Utah U-Save Energy Fund Program ("U-Save") finances energy-related cost reduction retrofits for publicly-owned buildings, including: state, tribal, municipal (city and county - which can include publicly-owned drinking water systems), public school districts, charter schools, public colleges, public university facilities. Through U-Save, low interest rate loans are provided to assist these institutions in financing their energy cost reduction efforts. Because this is a revolving loan fund, U-Save permits borrowers to repay loans through the stream of cost savings realized from these projects. Also because it is a revolving fund, the availability of funds may have to wait for fund repayments by previous applicants.

All U-Save projects must be analyzed by a Professional Engineer who meets the criteria outlined in Section II of the U-Save Program Guidebook (available on the Office of Energy Development (OED)'s website listed in the Appendix C of this document). Project descriptions and calculations are presented in an Energy Assessment Report ("EAR"), which is then reviewed and approved by the OED's technical staff before project financing is authorized. Projects financed by U-Save must have an average simple payback of five years or less. In the alternative, borrowers have the option of "buying down" paybacks to meet the five-year limit.

U-Save funds are available to retrofit existing equipment and installations. In identifying potential projects, technical analysts are encouraged to evaluate renewable energy technologies as well as more traditional energy retrofits. Such projects may include rooftop solar, water and space heating systems, electric generation with photovoltaic or small wind systems, or hydro-electric projects.

Following the approval of the borrower's loan application by OED, project designs are reviewed and monitored during the construction phase, as well as at project completion. The process for designing and implementing the project(s) approved for the borrower includes several milestones:

1. *Selecting a design engineer*. This can be the same engineer who prepared the EAR – however, the borrower must follow competitive procedures (unless the borrower has an engineer under an existing contract – e.g., the City Engineer).
2. *Preparing the design documents.* To ensure that the design specifications match the projects identified in the report, the OED technical staff will typically prepare the following reports: (1) Design Development Report ("DDR"); and (2) Detailed Design Review Report ("DDRR"). The DDR will be completed when the design process is approximately 50% complete and will verify that the design is proceeding in a direction that conforms with the EAR. The DDRR will evaluate the proposed schedule and estimated project construction budget provided by the design engineer.
3. *Bidding the work.* Borrowers must competitively select contractors or bidders as required by state law.

4. *Installing the projects.* To ensure that the work meets all technical and state requirements, OED will perform a construction monitoring visit at least once while the work is in progress.
5. *Closing out the project.* Upon completion of the project, the borrower will submit a Final Completion Report to OED.
6. *Repaying the loan.* OED will forward an Amortization Schedule to the borrower based on the incurred loan amount. Loan repayments will begin within 60 days of project completion and are due quarterly. The amount of annual loan repayment is based on the energy cost savings projected in the EAR. The typical borrower is obligated to repay the loan in 20 quarterly installments over a five-year period.

Post-retrofit energy savings should be monitored by the borrower to insure that energy is being conserved and energy cost savings are being realized. The level of monitoring can range from utility bill analysis to individual system or whole building metering, depending on the size and types of retrofits installed. Additional funds can be borrowed for the metering of large, complex retrofits. Loans are also available for systems considering to maximize the probability of achieving, or exceeding, calculated savings.

While the U-Save program is designed for retrofits to publicly-owned *buildings*, water system-related improvements may be included in these retrofits. Examples of potential retrofits include, but are not limited to, improvement to heating and cooling systems within water system buildings, and:

1. Replacing constant speed motors with variable speed motors or soft start motors
2. Replacing strategically located undersized pipelines or leaking pipelines with new adequately sized pipes
3. Adjusting and/or installing SCADA systems to maximize pumping during off-peak time periods
4. Replacing pumps: a) with worn out impellers, or b) operating outside its pump curve efficiency range.

C. Energy Service Companies: Energy performance contracting is a method of procurement that enables public entities to select a partner in making energy efficiency improvements to their facilities, without the need for capital expenditures. Enabled in Utah by the State legislature, (Utah Code 11-44), this method of construction has three significant requirements: 1) Annual savings must exceed annual project repayment cost, 2) Guarantees are required to ensure savings, and 3) Annual reporting is required to verify savings are being realized. These requirements protect the interests of the public entity.

Siemens will evaluate a process and if there is an opportunity for the public entity to save money, will design, build and operate the facilities to ensure its success. The public entity will then apply the savings from the improvements toward project repayment over the repayment term.

As mentioned previously, by state statute, all projects must be cash flow positive each year during the project repayment term. The public entity will receive the difference between the annual savings and the annual project repayment costs. Upon complete payment, the public entity will take over the operation of the facilities and reap the full annual savings thereafter. The provisions of the State law protect the public entity. The State also maintains a list of pre-qualified Energy Performance Contractors.

D. Rocky Mountain Power's Wattsmart Program Rocky Mountain Power offers a variety of ways to assist customers in maximizing the efficient utilization of electricity. Customer participation is voluntary and is initiated by following the participation procedures on the *watt*smart® Business section of the Company website at wattsmart.com.

The *watt*smart Business program offers a variety of services and cash incentives to encourage Rocky Mountain Power commercial, industrial and agricultural customers to build energy efficiency into their businesses. Retrofit and new construction projects can receive cash incentives for the implementation of approved energy efficiency measures. Typical upgrades, common in most buildings or businesses, have a pre-determined incentive value and can be found at rockymountainpower.net/utincentives.

Custom projects, such as those associated with water systems, are outside the scope of typical upgrades on the incentive lists. Rocky Mountain Power customers can benefit from the technical expertise of energy experts who will evaluate electric energy-saving options and estimate savings. Incentives for custom projects are $0.15 per annual kilowatt-hour savings, not to exceed 70% of eligible project costs for projects that meet simple payback period criteria. Customers looking at custom projects must contact Rocky Mountain Power before equipment is purchased to confirm that it qualifies for the custom incentive.

Beyond typical and custom incentives for energy-saving projects, Rocky Mountain Power non-residential customers can also benefit from guidance on day-to-day energy management of their systems. Customers can receive potential incentives of $0.02 per kilowatt-hour for verified savings of energy management measures. Visit rockymountainpower.net/utsave and select the Energy Management icon to learn more.

To participate in Rocky Mountain Power' energy efficiency programs, visit wattsmart.com and inquire online, email wattsmartbusiness@rockymountainpower.net or call toll free at 1-800-222-4335. As a reminder, contact the company early, before projects are initiated to confirm the project meets program criteria and eligibility

E. Self-funding through Energy Savings Some communities may be able to self-fund energy efficient projects. This is typically done with a fund within the City's budget that is not needed for a couple of years. The responsible party of the fund (let's call it the "Agency Fund") will arrange to invest its money into the City's water fund to build the energy saving project, and the Agency Fund will increase as an interest bearing investment. To accomplish this, the water fund

will pay back the loan with monthly or yearly payments. The period of the loan, or its time duration will be within the time constraints of the Agency Fund. The City's water fund will make payments to the Agency Fund from surplus revenues generated by the energy cost savings.

The following two tables are presented to enable an estimation of the water fund costs for varies interest rates and time periods for complete payback, with interest.

To determine the **monthly** payments associated with an inter-agency loan, determine the interest rate and the loan period in months. Then find the factor in the table below for the interest rate and time period. Then multiply the amount of the loan by the identified factor.

	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months
1 %	0.08379	0.04210	0.02821	0.02126	0.01709	0.01432	0.01233
2 %	0.08424	0.04254	0.02864	0.02170	0.01753	0.01475	0.01277
3 %	0.08469	0.04298	0.02908	0.02213	0.01797	0.01519	0.01321
4 %	0.08515	0.04342	0.02952	0.02258	0.01842	0.01565	0.01367
5 %	0.08561	0.04387	0.02997	0.02303	0.01887	0.01610	0.01413

To determine the **yearly** payments associated with an inter-agency loan, determine the interest rate and the loan period in years. Then find the factor in the table below for the interest rate and time period. Then multiply the amount of the loan by the identified factor.

	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years
1 %	1.0100	0.5075	0.3400	0.2563	0.2060	0.1725	0.1486
2 %	1.0200	0.5150	0.3468	0.2626	0.2122	0.1785	0.1545
3 %	1.0300	0.5226	0.3535	0.2690	0.2184	0.1846	0.1605
4 %	1.0400	0.5302	0.3603	0.2755	0.2246	0.1908	0.1666
5 %	1.0500	0.5378	0.3672	0.2820	0.2310	0.1970	0.1728

F. Bank Financing Banking institutions provide financial assistance to public water systems to design and construct capital improvements to drinking water system infrastructure. This section provides an overview of the financing tools available and an explanation of the process.

Banks lend money to public water systems and like other funding partners evidence that loan with one of two instruments: 1) municipal bond certificates, or 2) lease purchase agreements. The bank's benefit for lending the money is received from the interest charged on the loan. Interest paid by publically owned water systems is exempt from federal income tax requirements, allowing banks to charge a lower interest rate than would otherwise be charged.

Because banks lend money to make money, interest rates are determined by market conditions present at the time the financing takes place. Interest rates are a function of a bank's cost of funds, the credit profile of the borrower, and the credit structure of the financing instrument used.

To determine the best course of action, the public entity will generally contact their public finance banker. Although the process varies by institution, in general obtaining bank financing is fairly simple and involves the following steps.

- Provide financial information regarding the governmental entity
- Provide details regarding the project
- Determine the timing of the project and when funds are needed
- Determine the financing tool that works best
- Finalize credit and pricing determination
- Execute the necessary steps to consummate the transaction and close the loan

A decision to provide bank financing can be obtained within a week or two in most cases. Executing the necessary steps to finalize a transaction depends on which instrument is used, but ranges from one to three months in most cases and can take much longer in some cases. These cases are rare.

Governmental entities in Utah are political subdivisions of the State of Utah, with laws dictating the process by which funding occurs. If these laws are not followed, the financing would be considered illegal, and therefore not enforceable for repayment.

Municipal Bonds

The key legal steps required to sell municipal bonds generally follow the pattern below and can be taken simultaneously with the financing steps outlined above.

- Initial resolution of the governing body starting the process
- Public hearing
- Authorizing resolution of the governing body
- Closing/funding

It is possible to combine the resolutions approved by the governing body to expedite the process.

Types of Municipal Bonds

Municipal bond is a generic label describing a wide variety of tax exempt obligations. Governmental entities may issue different types of municipal bonds depending on the revenue sources that they receive and that can legally be pledged. The decision regarding the correct type of municipal bonds to sell can usually be determined by examining what will be pledged, the nature of the project, and the expected source of repayment.

General Obligation (G.O.) Bonds: G.O. bonds pledge the ad valorem property taxes of a governmental entity and usually use this property tax revenue stream to repay the bonds. These bonds can be used to finance water system projects or energy conservation projects and are typically viewed as being low risk and, therefore, result in lower interest

rates. These bonds must be approved by over 50% of the voters in a special bond election held in November. There is a limit to the amount of G.O. bonds that can be issued based upon market value, population, and the type of governmental entity.

Revenue Bonds (Enterprise Fund): Revenue bonds pledge water, sewer, electric, or other enterprise funds and usually use these revenues to repay the bonds. They can only be issued after authorization from the governing body. Legal covenants typically require that revenues after operational expenses are paid equal at least 125% of the required bond payment. A governmental entity will have to increase its user fees to maintain this 125% coverage ratio.

Sales, Franchise, and Excise Tax Revenue Bonds: Local governments can pledge sales, franchise, or other excise taxes for bonds sold to finance water or energy conservation projects, and they can use these same funds or other funds to repay the bonds. Sales, franchise, and excise tax bonds have been a popular financing tool because they can be used to finance nearly any type of capital improvement; they do not require voter authorization—only authorization from the governing body; and they generally receive favorable credit reviews which lower the interest rates.

Lease Revenue Bonds: Lease revenue bonds can be issued by a governmental entity and its Local Building Authority (LBA, formerly known as an MBA or Municipal Building Authority). An LBA is created for the express purpose financing, acquiring, building, owning, selling and leasing real property and equipment. The LBA becomes the owner of the facility being financed and leases it to a governmental entity on an annual basis. The bonds are secured by the lease payments and by a first lien on the financed improvements. Because lease revenue bonds are subject to annual appropriation or annual lease payments, they do not require voter authorization, but are considered more risky and bear higher interest rates.

This tool could be used to finance equipment meant to conserve energy, but might be limited by other bonds outstanding that prohibit the use of system assets as security.

Tax Increment Bonds: Some governmental entities may create a Community Development Area (CDA), Economic Development Area (EDA), or an Urban Renewal Area (RDA), to facilitate a water project that benefits only a specific geography, not the entire jurisdiction, and uses tax revenue generated within this area for repayment of the obligation. These areas are called increment areas. The tax revenues generated are derived from the increase in the taxable value in a project area and would generally only exist in areas that did not have water access previously. The incremental increase in taxes generated from the higher taxable value that results from new water improvements acts as the collateral, or security, for these bonds and usually acts as the source of repayment as well. These types of bonds are relatively risky because the increase in tax

increment is often based on projected increases of development and valuation; hence, the full tax increment may not always be realized. Bond covenants usually require that debt-service coverage be at least 1.25 times to 2.00 times, which will dictate the amount of tax increment bonds that can be issued.

Special Assessment Bonds: Similarly, governmental entities can create special assessment areas within their boundaries to finance water improvements or energy efficiency projects that will have a benefit to a specific group of properties; the owners of which will be required to pay special assessments that are used to repay the bonds. Governments create assessment areas by adopting an ordinance (as long as those property owners responsible for more than 50 percent of assessment do not oppose the ordinance). Once the assessment area is created and an assessment ordinance is approved, bonds can be sold. Special assessments on real property acts as security for these bonds and the repayment source. In the event of default, the properties are subject to foreclosure. Land values should exceed the bond amount by at least three times, and usually more.

Bond Type	Security/Collateral	Payment Source
General Obligation	Ad valorem property tax	Property taxes or other legally available revenue
Enterprise Revenue	Water, sewer, electric or other enterprise revenue	Enterprise revenue
Excise Tax Revenue	Sales or other excise taxes	Excise taxes or other legally available revenue
Lease Revenue	Annual lease payments and financed improvements	Any legally available funds
Tax Increment	Incremental tax revenue from growth in CDA, EDA, or URA	Incremental tax revenue
Special Assessment	Land within an assessment area	Special assessment revenue

Lease Purchase Agreements

Lease purchase agreements are very similar to Lease Revenue Bonds described above, however a bank takes the place of the Local Building Authority and accepts lease payments from a governmental entity. Unlike a LBA, the bank does not own the financed improvements, instead they take a lien position on whatever is financed enabling them to foreclose, repossess or otherwise confiscate the improvements in the event of default. Because the financed improvements are used as collateral, this financing tool is not useful for improvements buried in the ground or difficult to move. Additionally, as mentioned previously, if water or energy efficiency improvements are integral to a system and other bonds are outstanding, it would generally be prohibited to take new improvements as collateral making this tool ineffective.

This tool works well for vehicles, solar panels, detachable equipment, and in some cases land or buildings that would not interrupt the water system process were they taken in a foreclosure.

Appendix

The Appendix lists helpful web sites that relate to energy efficiency and/or funding opportunities.

A. Case Histories of Water Systems taking advantage of energy cost savings:

- Mountain Regional Water Special Service District:
- Logan City:
- Riverton City:

B. Drinking Water Board's financing program:

- The following web site accesses the application form for the Drinking Water Board's finance program: http://www.drinkingwater.utah.gov/documents/engineering/Utah_SRF_Application.zip
- The following web site provides the scheduled for Board meetings: http://www.drinkingwater.utah.gov/documents/engineering/SRF_schedule.pdf
- The following web site lists all the State agencies involved in funding drinking water projects: http://www.drinkingwater.utah.gov/loan_program_intro.htm

C. Utah Office of Energy Development's U-Save Program:

- Here is the link for more information on the U-Save program: http://energy.utah.gov/funding-incentives/energy-financing/
- Here is the link to the U-Save Program Guidebook: http://energy.utah.gov/download/u-save_documents_category_/U-Save%20Documents/U-Save%20Program%20Guidebook.pdf

D. Energy Service Companies:

- The following web site accesses the text of the State's "Facility energy efficiency Act": http://le.utah.gov/UtahCode/section.jsp?code=11-44
- The following web site provides a list of State Pre-Qualified Energy Performance Contracting Service providers. Companies appearing on this list are pre-qualified to do work for the State of Utah by the Division of Facilities Construction Management: http://www.deq.utah.gov/Topics/General/energyefficiency/docs/2014/08Aug/PQ601.pdf

E. Rocky Mountain Power's wattsmart program:

- For access to Rocky Mountain Power's website dealing with their wattsmart program, including information about the program and application forms: http://www.rockymountainpower.net/utincentives, wattsmart.com and http://www.rockymountainpower.net/utsave

F. Web sites that give guidance on performing Energy Audits:

- South Dakota's "Handbook on Eneergy Audits of Water Systems": The following web site links to a document prepared by HDR Engineering Inc. for the State of South Dakota in fulfillment of a contract: http://denr.sd.gov/documents/11energyaudits.pdf
- USDOE - Energy Demands on Water Resources 2006: http://www.sandia.gov/energy-water/congress_report.htm
- USEPA - Ensuring A Sustainable Future - Energy Management at Water Utilities: http://www.epa.gov/owm/waterinfrastructure/pdfs/guidebook_si_energymanagement.pdf
- WRF - Energy Efficiency Best Practices for DW Utilities: http://www.waterrf.org/PublicReportLibrary/4223.pdf
- Municipal Energy Efficiency and GHG Emissions Reduction - Financing Energy Efficiency Retrofits: http://www2.epa.gov/sites/production/files/2014-04/documents/efab_report_municipal_engergy_efficiency_ghg_emissions_reduction.pdf

G. Additional helpful web sites:

- The Lexington-Fayette Urban County Government oversees Live Green Lexington, a program that joins environmental policy, water quality, and waste management agencies to provide a set of environmental and energy programs aimed at consumers, businesses, and the public sector. http://www.lexingtonky.gov/index.aspx?page=2323
- States and local governments can amend existing regulations for public water and wastewater systems to include energy considerations in equipment procurement and improvements. Following the release of the Water and Wastewater Energy Best Practice Guidebook, the Wisconsin Department of Natural Resources encouraged energy considerations to be included in the required project cost-effectiveness calculations. Water and wastewater utilities can also incorporate energy efficiency into existing environmental goals or initiatives. http://watercenter.montana.edu/training/savingwater/mod2/downloads/pdf/SAIC_Energy_Best_Practice_Guidebook.pdf
- Raising awareness within local governments and water and wastewater utilities on the benefits of energy improvements requires a clear demonstration of where waste exists in facilities, which can be accomplished for a low cost through a professional energy audit. Use EPA Portfolio Manager, or a similar tool, to gather and track energy data. NYSERDA's Web page and the Best Practices Handbook listed below also contain excellent resources on benchmarking and payback analysis. http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager

http://www.nyserda.ny.gov/Energy-Efficiency-and-Renewable-Programs/Commercial-and-Industrial/Sectors/Municipal-Water-and-Wastewater.aspx

- EPRI Energy Audit Manual for Water/Wastewater Facilities
  http://watercenter.montana.edu/training/savingwater/mod2/downloads/pdf/EPRI_Energy_Audit_Manual.pdf
- Improving Energy Management at Water and Wastewater Utilities in Massachusetts
  http://www.mass.gov/eea/docs/dep/water/priorities/ener11.pdf
- How to Boost Energy Efficiency in Municipal Facilities/Operations (New York State)
  http://www.dec.ny.gov/energy/64322.html
- Energy Use at Wisconsin's Drinking Water Facilities
  http://www.ecw.org/sites/default/files/222-1.pdf
- Energy Efficiency in Water and Wastewater Facilities
  http://www.pwb.wa.gov/Documents/EPA-wastewater-guide.pdf
- Financial and Technical Assistance for Green Projects
  (Maricopa Association of Governments, Arizona)
  https://www.azmag.gov/waterWorkshop/WaterWorkshop_Sess-2_PP-1.pdf
- Efficiency Vermont
  https://www.efficiencyvermont.com/For-My-Business/Solutions-For/Water-Wastewater-Facilities

Agenda Item 7(A)

RULE ADOPTION FOR RULE REVISION OF *R309-400*

On July 18, 2014, the Drinking Water Board authorized the Division staff to initiate the rulemaking process to revise R309 400 for the adoption of the Groundwater Rule, to correct outdated rule references and add missing ones, as well as miscellaneous changes to correct formatting, grammar and to make the rule language more easily understood.

These rule revisions were substantive and were filed with the Division of Administrative Rules for publication in the September 1, 2014, Utah Bulletin. The 30-day formal comment period ended on October 1, 2014. No comments were received.

Staff Recommendation:

The Staff recommends the Board adopt the rule revisions to *R309-400* and authorize staff to make this rule change effective on November 10, 2014.

R309. Environmental Quality, Drinking Water.
R309-400. Water System Rating Criteria.
R309-400-1. Authority.

Under authority of Utah Code Annotated, Section 19-4-104, the Drinking Water Board adopts this rule in order to evaluate a public water system's standard of operation and service delivered in compliance with R309-100 through R309-705 hereinafter referred to as Rules.

R309-400-2. Extent of Coverage.

[~~These rules~~]This rule shall apply to all public water systems as defined in R309-100.

R309-400-3. Definitions.

[~~Approved - means that the public water system is operating in substantial compliance with all the Rules as measured by this rule.~~

~~Community Water System - means a public water system which serves at least fifteen service connections used by year-round residents or regularly serves at least year-round residents.~~

~~Contaminant - means any physical, chemical, biological, or radiological substance or matter in water.~~

~~Corrective Action - means a provisional rating for a public water system not in compliance with the Rules, but making all the necessary changes outlined by the Director to bring into compliance.~~

~~Director - means the Director of the Division of Drinking Water.~~

~~Major Bacteriological Routine Monitoring Violation- means that no routine bacteriological sample was taken as required by R309-210-5(1).~~

~~Major Bacteriological Repeat Monitoring Violation - means that no repeat bacteriological sample was taken as required by R309-210-5(2)(a).~~

~~Major Chemical Monitoring Violation - means that no initial background chemical sample was taken as required in R309-515-4(5).~~

~~Maximum Contaminant Level (MCL) - The maximum permissible level of a contaminant in water is delivered to any user of a public water system. Individual maximum contaminant levels (MCLs) are listed in R309-200.~~

~~Minor Bacteriological Routine Monitoring Violation- means that not all of the routine bacteriological samples were taken as required by R309-210-5(1).~~

~~Minor Bacteriological Repeat Monitoring Violation - means that not all of the repeat bacteriological samples were taken as required by R309-210-5(2)(a).~~

~~Minor Chemical Monitoring Violation - means that the required chemical sample(s) was not taken in accordance with R309-205, 210 or 215.~~

~~Non-Community Water System - means a public water system that is not a community water system or a non-transient non-community water system.~~

~~Non-Transient, Non-Community Water System - means a public water system that is not a community water system and that regularly serves at least 25 of the same persons for more than six months per year. Examples are separate systems serving workers and schools.~~

~~Not Approved - means the water system does not fully comply with the Rules as measured by this rule.~~

~~Public Water System - means a system, either publicly or privately owned, providing water for human consumption and other domestic uses which has at least fifteen service connections, or regularly serves an average of at least twenty-five individuals for at least sixty days out of the year. Such term includes collection, treatment, storage and distribution facilities under control of the operator and used primarily in connection with the system. Additionally, the term includes collection, pretreatment or storage facilities used primarily in connection with system but not under such control.~~

~~Routine Chemical Monitoring Violation - means no routine chemical sample(s) was taken as required in R309-205, 210 or 215.~~

~~Sanitary Seal - A cap that prevents contaminants from entering a well through the top of the casing.~~

~~Shall - means that a particular action is obliged and has to be accomplished.~~]

Definitions for certain terms used in this rule are given in R309-110 but may be further clarified herein.

Corrective Action Plan – an agreement between the Division of Drinking Water and a public drinking water system establishing conditions and timelines for addressing significant deficiencies or E. coli contamination of a drinking water source.

Treatment Technique – A required process intended to reduce the level of a contaminant in drinking water.

Treatment Technique Violation – failure to correct significant deficiencies, address E. coil positive source contamination or adhere to specific terms of a Corrective Action Plan.

R309-400-4. Water System Ratings.

(1) The Director shall assign a rating to each public water system in order to provide a concise indication of its condition and performance. This rating shall be assigned based on the evaluation of the operation and performance of the water system in accordance with the requirements of the Rules. Points shall be assessed to [~~Not Approved and Corrective Action rated~~]water systems for each violation of these requirements (R309-100 through R309-705) as the requirements apply to each individual water system. The number of points that shall be assessed [~~are~~]is outlined in the following sections of this rule. The number of points represents the threat to the quality of the water and thereby public health.

(2) Points are assessed in the following categories: Quality, Monitoring and Public Notification; Physical Deficiencies; Operator Certification; Cross Connection Control; Drinking Water Source

Protection; Administrative Issues; and, Reporting and Record Maintenance.

(3) Based upon the accumulation of points, the public water system shall be assigned one of the following ratings[.]:

(a) Approved - In order to qualify for an Approved rating, the public water system must maintain a point total less than the following:

(i) Community water system - 150 points;

(ii) Non-Transient Non-Community water system - 120 points; and

(iii) Non-Community water system - 100 points.

(b) Not Approved - In order for a public water system to receive a Not Approved rating the accumulation of points for the water system must exceed the totals listed above.

(c) Corrective Action - In order to qualify for a Corrective Action rating the public water system must submit the following:

(i) A written agreement to the Director stating a willingness to comply with the requirements set forth in the Rules; and,

(ii) A compliance schedule and time table agreed upon by the Director outlining the necessary construction or changes to correct any physical deficiencies or monitoring failures; and,

(iii) Proof of the financial ability of the water system or that the financial arrangements are in place to correct the water system deficiencies.

(iv) The Corrective Action rating shall continue until the total project is completed or until a suitable construction inspection or sanitary survey is conducted to determine the effectiveness of the improvements or the accumulation of points drops below the threshold for a not approved rating whichever is later.

(4) The water system point accumulation shall be adjusted on a quarterly basis or as current information is available to the Director. The appropriate water system rating shall then be adjusted to reflect the current point total.

(5) The Director may at any time rate a water system [not approved]Not Approved, if an immediate threat to public health exists. This rating shall remain in place until such time as the threat is alleviated and the cause is corrected.

(6) Any water system may appeal its assigned rating or assessed points as provided in R305-7.

R309-400-5. Quality, Monitoring and Public Notification Violations.

(1) [~~Bacteriologic~~]Total Coliform Rule: All points assessed to public water systems via this subsection are based on violations of the quality standards in R309-200-5(6); or the monitoring requirements in R309-210-5; and the associated public notification requirements in R309-220. The bacteriological [~~assessments~~]points assessed shall be updated on a monthly basis with the total number of points reflecting the most recent twelve month period or the most

recent 4 quarters for those water systems that collect bacteriological samples quarterly, unless otherwise noted.

(a) For each major bacteriological routine monitoring violation, 35 points shall be assessed. For each failure to perform the associated public notification 5 points shall be assessed.

(b) For each minor bacteriological routine monitoring violation, 10 points shall be assessed. For each failure to perform the associated public notification 2 points shall be assessed.

(c) For each major bacteriological repeat monitoring violation, 40 points shall be assessed. For each failure to perform the associated public notification 5 points shall be assessed.

(d) For each minor bacteriological repeat monitoring violation, 10 points shall be assessed. For each failure to perform the associated public notification 2 points shall be assessed.

(e) For each additional monitoring violation (R309-210-5(2)(e)), 10 points shall be assessed. For each failure to perform the associated public notification 2 points shall be assessed.

(f) For each non-acute bacteriological MCL violation (R309-200-5(6)(a)), 40 points shall be assessed. For each failure to perform the associated public notification 10 points shall be assessed.

(g) For each acute bacteriological MCL violation (R309-200-5(6)(b)), 50 points shall be assessed. For each failure to perform the associated public notification 10 points shall be assessed.

(2) Ground Water Rule: All points assessed to public water systems via this subsection are based on violations of the standards in R309-215-16. Points assessed for any significant deficiency shall be deleted as the deficiencies are corrected and are reported to the Director. The bacteriological points assessed shall be updated on a monthly basis with the total number of points reflecting the most recent 12-month period or the most recent four quarters for those water systems that collect bacteriological samples quarterly, unless otherwise noted.

(a) For failure to collect triggered source samples in violation of R309-215-16(2)(a)(i)(A) and (a)(i)(B), 40 points shall be assessed. For each failure to perform the associated public notification, 2 points shall be assessed.

(b) For failure to collect assessment source samples in violation of R309-215-16(2)(b)(i), 5 points shall be assessed. For each failure to perform the associated public notification, 2 points shall be assessed.

(c) For failure to correct a significant deficiency in violation of R309-215-16(4)(a)(i) and (ii), R309-215-16(4)(c) or R309-215-16(4)(d), 35 points shall be assessed. For each failure to perform the associated public notification, 2 points shall be assessed.

(d) For an Escherichia coli. in violation of R309-215-16(4)(b)(i) and (ii), 40 points shall be assessed. For each failure to perform the associated public notification, 2 points shall be assessed.

([~~2~~]3) Chemical: All points assessed to public water systems via this subsection are based on violations of the quality standards in R309-200-5; or the monitoring requirements in R309-205, 210 and 215; and the associated public notification requirements in R309-220. The chemical assessments shall be updated on a quarterly basis with the total number of points reflecting the most recent compliance period unless otherwise specified. Points for any chemical MCL violation shall remain on record until the quality issue is resolved. Points for any monitoring violation shall be deleted as the required chemical samples are taken and the analytical results are reported to the Director.

(a) Inorganic and Metal Contaminants:

(i) For each major chemical monitoring violation for inorganic and metal contaminants, 20 points shall be assessed. For each failure to perform the associated public notification, 3 points shall be assessed.

(ii) For each minor chemical monitoring violation for inorganic and metal contaminants, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(iii) For each MCL exceedance for inorganic and metal contaminants, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(b) Sulfate (for non-community water systems only):

(i) For each major chemical monitoring violation for sulfate, 20 points shall be assessed. For each failure to perform the associated public notification, 3 points shall be assessed.

(ii) For each minor chemical monitoring violation for sulfate, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(iii) For each MCL exceedance for sulfate, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(c) Radiologic Contaminants:

(i) For each major chemical monitoring violation for radiological contaminants, 20 points shall be assessed. For each failure to perform the associated public notification, 3 points shall be assessed.

(ii) For each minor chemical monitoring violation for radiological contaminants, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(iii) For each MCL exceedance for radiological contaminants, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(d) Asbestos Contaminants:

(i) For each major chemical monitoring violation for source water or distribution system asbestos, 20 points shall be assessed. For each failure to perform the associated public notification, 3 points shall be assessed.

(ii) For each minor chemical monitoring violation for source water or distribution system asbestos, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(iii) For each MCL exceedance for source water or distribution system asbestos, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(e) Nitrate:

(i) For each routine chemical monitoring violation for nitrate, [~~35~~]50 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(ii) For each MCL exceedance of nitrate, [~~50~~]60 points shall be assessed. For each failure to perform the associated public notification, 10 points shall be assessed.

(f) Nitrite:

(i) For each routine chemical monitoring violation for nitrite, 35 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(ii) For each MCL exceedance of nitrite, 50 points shall be assessed. For each failure to perform the associated public notification, 10 points shall be assessed.

(g) Volatile Organic Chemicals:

(i) For each major chemical monitoring violation for volatile organic chemical contaminants, 20 points shall be assessed. For each failure to perform the associated public notification, 3 points shall be assessed.

(ii) For each minor chemical monitoring violation for volatile organic chemical contaminants, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(iii) For each MCL exceedance for volatile organic chemical contaminants, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(h) Pesticides/PCBs/SOCs

(i) For each major chemical monitoring violation for pesticide/PCB/SOC contaminants, 20 points shall be assessed. For each failure to perform the associated public notification, 3 points shall be assessed.

(ii) For each minor chemical monitoring violation for pesticide/PCB/SOC contaminants, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(iii) For each MCL exceedance for pesticide/PCB/SOC contaminants, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(i) Disinfection Byproducts:

(i) Total Trihalomethanes:

(A) For each routine chemical monitoring violation for total trihalomethanes, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(B) For each MCL exceedance for total trihalomethanes, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(ii) Haloacetic Acids (HAA5):

(A) For each routine chemical monitoring violation for HAA5, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(B) For each MCL exceedance for HAA5, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(iii) Bromate:

(A) For each routine chemical monitoring violation for bromate, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(B) For each MCL exceedance for bromate, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(iv) Chlorite:

(A) For each routine chemical monitoring violation for chlorite, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(B) For each MCL exceedance for chlorite, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(j) Disinfectant Residuals:

(i) Chlorine:

(A) For each routine chemical monitoring violation for chlorine, 10 points shall be assessed. R309-210-8(3)(a). For each failure to perform the associated public notification, 1 point shall be assessed.

(B) For each MCL exceedance for chlorine, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(C) For a disinfected system that does not maintain a trace residual at all points of the distribution system, 2 points shall be

assessed. R309-105-10(1) & R309-200-5(7).

(D) For a disinfected system that lacks an adequate number of disinfection residual sample sites, 2 points shall be assessed. R309-210-8(3)(a)(i)(z15).

(ii) Chloramines:

(A) For each routine chemical monitoring violation for chloramines, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(B) For each MCL exceedance for chloramines, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(iii) Chlorine Dioxide:

(A) For each routine monitoring violation for chlorine dioxide, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(B) For each non-acute chlorine dioxide MCL violation, 30 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(C) For each acute chlorine dioxide MCL violation, 50 points shall be assessed. For each failure to perform the associated public notification, 10 points shall be assessed.

(iv) Ground Water Rule, where a water system has received a 4-Log exemption from triggered source water monitoring:

(A) For a ground water treatment facility serving greater than 3300 population lacking equipment to measure chlorine residuals continuously entering the distribution system, 20 points shall be assessed. R309-215-10(1).

(B) For a ground water system serving greater than 3300 people failing to continuously monitor the residual disinfectant concentrations, 10 points shall be assessed. R309-215-16(3)(b)(iii)(A)(I).

(C) For a ground water system serving less than 3300 people failing to collect a daily grab sample during peak demand to monitor the residual disinfectant concentrations, 10 points shall be assessed. R309-215-16(3)(b)(iii)(A)(II).

(D) For a ground water system that during the past year, the disinfection process was not operated uninterrupted while water was being produced, points will be assessed based on monthly and quarterly treatment reports. R309-200-5(7).

(E) For a ground water system that is required to provide continuous disinfection but fails to do so, 10 points shall be assessed for each month the failure continues. R309-520-6(1).

(k) Lead and Copper:

(i) For each major chemical monitoring violation for lead and copper contaminants, 20 points shall be assessed. For each failure to perform the associated public notification, 3 points shall be assessed.

(ii) For each minor chemical monitoring violation for lead and copper contaminants, 10 points shall be assessed. For each failure to perform the associated public notification, 1 point shall be assessed.

(iii) A system [~~which~~]that fails to install, by the designated deadline, optimal corrosion control if the lead or copper action level has been exceeded shall be assessed 35 points. For each failure to perform the associated public notification, 10 point shall be assessed.

(iv) A system [~~which~~]that fails to install source water treatment if the source waters exceed the lead or copper action level shall be assessed 35 points. For each failure to perform the associated public notification, 10 points shall be assessed.

(v) A system [~~which~~]that fails to complete public notification/education if the lead/copper action levels have been exceeded shall be assessed 10 points for each calendar quarter that the system fails to provide public notification/education.

(vi) A system [~~which~~]that still exceeds the lead action level and is not on schedule for lead line replacement shall be assessed 5 points annually. For each failure to perform the associated public notification, 2 point shall be assessed.

(vii) A system that fails to notify its customers of their lead and copper sample results, 5 points shall be assessed.

(viii) A system that fails to send the lead and copper certification notice to the Division, 5 points shall be assessed.

(l) Groundwater Turbidity:

(i) For each monitoring violation for turbidity, 35 points shall be assessed. For each failure to perform the associated public notification, 5 points shall be assessed.

(ii) For each confirmed MCL exceedance of turbidity, 50 points shall be assessed. For each failure to perform the associated public notification, 10 points shall be assessed.

(m) Surface Water Treatment:

(i) For water systems having sources, which are classified as under direct influence from surface water and which fail to abandon, retrofit or provide conventional complete treatment or [~~it's~~]its equivalent within 18 months of notification shall be assessed 150 points. For the associated failure to perform public notification 10 points shall be assessed. The points shall be assessed as the failure occurs and shall remain on record until adequate treatment is provided or the source is physically disconnected.

(ii) Quality and Monitoring: The surface water treatment assessments shall be updated on a monthly basis with the total number of points reflecting the most recent [~~twelve~~]12-month period.

(A) Turbidity:

(I) For each turbidity exceedance [~~which~~]that requires tier 1 notification under R309-220-5(1)(e) or (f), 50 points shall be assessed. For the associated failure to perform public notification, 10 points shall be assessed.

(II) For each turbidity exceedance [~~which~~]that requires tier 2 notification under R309-220-5(1)(e) or (f), 35 points shall be assessed. For the associated failure to perform public notification, 10 points shall be assessed.

(III) For each month where the percentage of turbidity interpretations meeting the treatment plant limit is less than 95 percent, 25 points shall be assessed. For the associated failure to perform public notification, 10 points shall be assessed.

(IV) For any period of time [~~which~~]that exceeds 4 hours where the system fails to continuously measure (or perform grab samples) the combined filter effluent turbidity, 50 points shall be assessed. For the associated failure to perform public notification, 10 points shall be assessed.

(V) For a water system [~~which~~]whose failure to repair continuous turbidity monitoring equipment within 5 working days, 50 points shall be assessed.

(B) Disinfection:

(I) For each instance where the disinfectant level in water entering the distribution system is less than 0.2 milligrams per liter for more than 4 hours, 25 points shall be assessed. For the associated failure to perform public notification, 5 points shall be assessed.

(II) For each instance where there is insufficient disinfectant contact time, 35 points shall be assessed. For the associated failure to perform public notification, 5 points shall be assessed.

(iii) Treatment Process Control:

(A) For each instance a treatment facility exceeds the assigned filter rates, 30 points shall be assessed.

(B) For each month a water system fails to verify calibration of the plant turbidimeters, 5 points shall be assessed.

(C) For each month a water system fails to submit a water treatment plant report, 50 points shall be assessed.

R309-400-6. Physical Facilities.

All points assessed to public water systems via this subsection are based upon violation of R309-500 through R309-705 unless otherwise noted. These points shall be assessed and updated upon notification of the Director and shall remain until the violation or deficiency no longer exists.

(1) New Source Approval:

(a) Use of an unapproved source shall be assessed [~~150~~]200 points.

(2) Surface Water Diversion Structures and Impoundments:

(a) For each surface water intake structure that does not allow for withdrawal of water from more than one level if quality significantly varies with depth, 2 points shall be assessed. R309-515-5(5)(a).

[~~(b) Where no facilities exist for release (wasting) of less desirable water held in storage 2 points shall be assessed.~~

~~(c) Where the diversion facilities do not minimize frazil ice formation by holding intake velocities to less than 0.5 feet per second 2 points shall be assessed.~~

~~(d) Where diversion facilities are not adequately protected from damage by ice buildup 2 points shall be assessed.~~]

([~~e~~]b) Where diversion facilities are not capable of keeping large quantities of fish or debris from entering the intake, 2 points shall be assessed. R309-515-5(5)(e).

([~~f~~]c) Where impoundment reservoirs have not had brush and trees removed to the high water level, 2 points shall be assessed. R309-515-5(6)(a).

([~~g~~]d) Where reservoir watershed management has not provided adequate precautions to limit nutrient loading, 10 points shall be assessed. R309-515-5(6)(d).

(3) Well Sources

(a) For each well [~~which~~]that is not equipped with a sanitary seal, or has any unsealed opening into the well casing, 50 points shall be assessed. R309-515-6(6)(i).

(b) For each well [~~which~~]that does not utilize food grade mineral oil for pump lubrication, 25 points shall be assessed. R309-515-8(2).

(c) For each well casing [~~which~~]that does not terminate at least 12 inches above the [~~pump~~]well house floor, 18 inches above the final ground surface, [~~and/or five feet above the highest flood elevation and is~~]or shows evidence of being subject to flooding, 20 points shall be assessed. R309-515-6(6)(b)(vi) and R309-515-6(13)(a) and (d).

(d) For each well fitted with a pitless adaptor that does not maintain a water tight seal throughout, 50 points shall be assessed [~~50 points~~]. R309-515-6(12)(c)(x).

(e) For each wellhead that is not properly secured to protect the quality of the well water, 20 points shall be assessed. R309-515-6(13)(f).

(f) For each well that is equipped with a pump to waste line that does not discharge [~~though an approved air gap~~]with a minimum of 12-inch clearance to the flood rim, 20 points shall be assessed [~~20 points~~]. R309-515-6(12)(d)(ix).

(g) For each well that is equipped with a pump to waste line [~~that is not properly screened~~]without a downturned discharge end covered with a No. 4 mesh screen, 5 points shall be assessed[~~5 points~~]. R309-515-6(12)(d)(ix).

(h) For each well that is equipped with a pump to waste line that discharges to a receptacle without local authorization, 2 points shall be assessed[~~2 points~~].

(i) For each well that does not have a means to [~~measure drawdown 1 point~~]permit periodic measurement of water levels, 2 points shall be assessed. R309-515-6(12)(e)(i) and (ii).

(j) For each well casing vent [~~which~~]that is not [~~properly~~]covered with a No. 14 or finer mesh screen, 2 points shall be assessed. R309-515-6(12)(d)(iii) and R309-550-6(6)(b).

(k) For each well casing vent [~~which~~]that is not [~~properly turned down~~]downturned, 2 points shall be assessed. R309-515-6(12)(d)(iii) and R309-550-6(6)(b). Also Division of Water Rights Rule R655-4-11.7.11.

(l) For each well casing vent [~~which~~]that does not [~~discharge through a proper air gap~~]have adequate clearance to prevent the contaminants from entering the well, 2 points shall be assessed. R309-515-6(12)(d)(iii) and R309-550-6(6)(b).

(m) For each well (excluding the naturally flowing wells) [~~which~~]that has discharge piping that is not [~~properly~~]equipped with 1) a smooth nosed sampling tap 2) check valve 3) pressure gauge 4) means of measuring flow, and 5) shut-off valve, 1 point shall be assessed for each component not present. R309-515-6(12)(d)(iv).

(n) For each well [~~where there is no~~]that pumps directly into a distribution system and does not have a means to release trapped air from the discharge piping (for example, release air through an air release vacuum relief valve, through a pump to waste line or pumps directly to a tank), [~~6~~]5 points shall be assessed. R309-515-6(12)(d)(v).

(o) For each well house [~~which does not have a drain-to-daylight installed~~]that is not at least 6 inches above the final ground level, is not sloped to drain, or shows evidence of being subject to flooding, 5 points shall be assessed. R309-515-6(13)(b).

(p) For each well [~~which~~]that has a cross connection present in the discharge piping, [~~5~~]20 points shall be assessed. R309-105-12(1) and R309-515-6(12)(d)(iii).

(q) For each well [~~which has discharge piping equipped~~] with an air vacuum relief valve [~~which~~]on the well discharge piping that is not screened, 2 points shall be assessed. R309-515-6(12)(d)(v).

(r) For each well [~~which has discharge piping equipped~~]with an air vacuum relief valve [~~which~~]on the well discharge piping that is not [~~properly turned down~~]downturned, 2 points shall be assessed. R309-515-6(12)(d)(v).

(s) For each well [~~which has discharge piping equipped~~] with an air vacuum relief valve [~~which~~]on the well discharging piping that does not [~~discharge through an approved air gap~~]have a 6-inch clearance to prevent contaminants from entering the piping, 2 points shall be assessed. R309-515-6(12)(d)(v).

(t) For each well [~~which~~]that has rotating and electrical equipment that is not provided with protective guards, 2 points shall be assessed.

(4) Spring Sources:

(a) For each spring source [~~which~~]that allows surface water to stand or pond upon the spring collection area (within 50 feet from collection devices), 10 or 20 points shall be assessed. The number

of points shall be based upon the size and extent of the ponding; the possible source (rainfall or incomplete collection); or the presence of moss or other indicators of long term presence of standing water. R309-515-7 (7)(i).

(b) For each spring area [~~which~~]that does not have a minimum of ten feet of relative impervious soil or an acceptable alternate design with liner, or the spring collection area shows evidence of damaged liner or impervious soil cover, 10 points shall be assessed. R309-515-7(7)(a) and (b).

(c) For each spring area that has [~~deep rooted~~]deep-rooted vegetation within the fenced collection area, 10 points shall be assessed. R309-515-7(7)(f).

(d) For each spring area that has deep rooted vegetation interfering with the spring collection, 10 points shall be assessed. R309-515-7(7)(f).

(e) For each spring with a spring collection/junction box [~~which~~]that does not have a proper shoebox lid, 5 points shall be assessed [~~5 points~~]. R309-515-7(7)(d) and R309-545-14(2).

(f) For each spring with a spring collection/junction box [~~which~~]that does not have a proper gasket on the lid, 5 points shall be assessed [~~5 points~~]. R309-515-7(7)(d) and R309-545-14(2).

(g) For each spring with a spring collection/junction box [~~which~~]that lacks an adequate air vent, 5 points shall be assessed. R309-515-7(7)(d) and R309-545-15.

(h) For each spring with a spring collection/junction box with a vent that is not [~~properly~~]screened with No. 14 mesh screen, 2 points shall be assessed [~~2 points~~]. R309-515-7(7)(d) and R309-545-15.

(i) For each spring with a spring collection/junction box with a vent that is not [~~properly down turned~~]down-turned or inverted, 2 points shall be assessed [~~2 points~~]. R309-515-7(7)(d) and R309-545-15(1).

(j) For each spring with a spring collection/junction box with a vent that [~~is not properly air gapped~~]does not have sufficient clearance to prevent ice blockage, or is not at least 24 inches above the earthen cover, 2 points shall be assessed [~~2 points~~]. R309-515-7(7)(d) and R309-545-15(2).

(k) For each spring with a spring collection/junction box that lacks a raised access entry, at least 4 inches above the spring box or 18 inches above the earthen cover, 5 points shall be assessed [~~5 points~~]. R309-515-7(7)(d) and R309-545-14(1).

(l) For each spring with a spring collection/junction box [~~which~~]that is not secured against unauthorized access, 20 points shall be assessed [~~20 points~~]. R309-515-7(7)(d) and R309-545-14(3).

(m) For each spring collection area without a proper fence, [~~(unless the spring is located in a remote area where no grazing or public access is possible as specified in R309-515-7(7)(e)~~]10 points shall be assessed. R309-515-7(7)(e).

(n) For each spring collection area that does not have a diversion channel, or berm capable of diverting surface water away from the collection area, 5 points shall be assessed. R309-515-7(7)(g).

(o) For each spring system [~~which~~]that does not have a permanent flow measuring device, 5 points shall be assessed. R309-515-7(7)(h).

(p) For each spring area with an overflow[~~/drain~~]or a combined overflow/drain discharge that is not [~~properly~~]screened with a No. 4 mesh screen, 5 points shall be assessed. R309-515-7(7)(d) and R309-545-13.

(q) For each spring collection/junction box overflow that does not have [~~adequate~~]a freefall of [~~(~~]12 to 24 inches[~~)~~] between the [~~drain invert~~]bottom of the discharge pipe and the surrounding ground, 5 points shall be assessed. R309-515-7(7)(d) and R309-545-13.

(r) For each spring collection/junction box that has any unsealed opening(s) resulting in public health risk, 50 points shall be assessed. R309-515-7(7)(d) and R309-545-9(1).

(5) Pump Stations.

[~~(a) For a pumping facility which does not have a positive-acting check valve between the pump and the isolation valve 1 point shall be assessed. R309-540-5(6)(a).~~]

([~~b~~]a) For a pumping facility ~~which~~]that does not have a standard pressure gauge on the discharge line, 1 point shall be assessed. R309-540-5(6)(c[~~–~~])(i).

[~~(c) For a pumping facility which does not have a flow measuring device on the discharge piping 1 point shall be assessed. R309-540-5(6)(c)(iii).~~

~~(d) For a pumping facility which does not have isolation valve(s) on the discharge piping 1 point shall be assessed. R309-540-5(6)(a).~~

~~(e) For a pumping facility which does not have isolation valve(s) on the suction side of each pump 1 point shall be assessed. R309-540-5(6)(a).~~]

([~~f~~]b) For a pumping facility building without adequate drainage or showing evidence of flooding, 5 points shall be assessed. R309-540-5(2)(a)[~~–~~](v) and (vi).

([~~g~~]c) For a pumping facility where the discharge line from the air release valve is not [~~properly~~]screened with number 14 non-corrodible mesh screen, 2 points shall be assessed. R309-540-5(6)(b)(ii) and R309-550-6(6)([~~a~~]b).

(d) For an air release valve located within a building, if the discharge line terminates less than six inches above the floor, 2 points shall be assessed. R309-515-6(12)(d)(v) and R309-540-5(6)(b)(ii).

([~~h~~]e) [~~For a pumping facility where the discharge line from the air release valve is not properly air gapped 2 points shall be assessed.~~]For an air release valve located in a chamber, if the air

release valve discharge piping terminates less than 12 inches above grade, or less than one foot above the top of the pipe where the chamber is not subject to flooding, 10 points shall be assessed. R309-540-5(6)(b)(ii) and R309-550-6(6)([a]b).

([i]f) For a pumping facility where the discharge line from the air release valve is not [properly]down-turned, 2 points shall be assessed. R309-540-5(6)(b)(ii) and R309-550-6(6)([a]b).

[(j) For a pumping facility where the building and equipment is not protected from flooding 5 points shall be assessed. R309-540-5(2)(a)(ii), (iii) and (iv).]

([k]g) For a pumping facility where there is inadequate heating, lighting or ventilation, 5 points shall be assessed. R309-540-5(2)(e), (f) and (g).

([l]h) For a pumping facility where there are cross connections present, [5]20 points shall be assessed. [R309-540-5(2)(h)]R309-105-12(1).

([m]i) For [a]an inline booster pumping facility designed to provide pressure directly to the distribution system, which does not have at least two [equal and functioning] pumping units such that with any one pump out of service the remaining pump or pumps are capable of meeting the peak day demand of the specific portion of the system served, 20 points shall be assessed. R309-540-5(4)(b).

(n) For a pumping facility which cannot meet the demand when the largest pumping unit is out of service 20 points shall be assessed. R309-540-5(4)(b).***If have 2 pumps but don't meet peak – 40 pts. If you don't have 2 pumps (and therefore can't meet peak w/2nd pump) – 20 pts. Combine questions or rephrase.

[(o) For a pumping facility which utilizes oil lubrication not suitable for human consumption 25 points shall be assessed. R309-105-10(7).]

([p]j) For a pumping facility which does not have protective guards on rotating and electrical equipment, 2 points shall be assessed. [R309-545-19(1)]R309-525-21.

[(q) For a pumping facility which does not have an air release valve or other means to release trapped air located on the pump discharge piping 6 points shall be assessed. R309-515-6(12)(e)(v).]

([r]k) For a pumping facility which is not secured against unauthorized access shall be assessed, [20]5 points. R309-540-5(1)(a)(v).

(6) Hydropneumatic pressure tanks.

[(a) For a pressure tank without at least two pumping units 20 points shall be assessed. R309-540-6(5).

(b) For a pressure tank without a bypass piping to permit operation of the system while it is being repaired or painted 2 points shall be assessed. R309-540-6(4).

(c) For a pressure tank which lacks a 24 inch access manhole where applicable 1 point shall be assessed. R309-540-6(6).

(d) For a pressure tank which lacks a drain 1 point shall be assessed. R309-540-6(6).

~~(e) For a pressure tank which lacks a pressure gauge 1 point shall be assessed. R309-540-6(6).~~
~~(f) For a pressure tank which lacks a water sight glass where applicable 1 point shall be assessed. R309-540-6(6).~~
~~(g) For a pressure tank which lacks automatic or manual air blow-off 1 point shall be assessed. R309-540-6(6).~~
~~(h) For a pressure tank which lacks a means to add air 1 point shall be assessed. R309-540-6(6).~~
~~(i) For a pressure tank which lacks pressure operated start-stop controls for the pump(s) 1 point shall be assessed. R309-540-6(6).~~]

(a) For diaphragm or air tanks located below ground without adequate provisions for drainage, maintenance and flood protection, 10 points shall be assessed. R309-540-6(2).

([~~j~~]b) For a pressure tank with a pump cycle that cycles more frequently than once every 4 minutes, 5 points shall be assessed. R309-540-6(5).

[~~(k) For a pressure tank and controls that are not secured against unauthorized access 20 points shall be assessed. R309-545-14(3).~~]

(7) Storage:

(a) A water system with [~~an~~] uncovered finished water storage [~~reservoir~~]shall immediately be assessed a rating of not approved[~~.~~], [~~150~~]200 points shall be assessed. R309-545-9(1) and (2).

(b) For each storage [~~reservoir cover that is not sloped so water will drain~~]tank roof showing evidence of water ponding with deterioration, 10 points shall be assessed. R309.545-9(4).

(c) For each storage [~~reservoir~~]tank that does not have an access [~~opening~~]to the interior for cleaning and maintenance, 9 points shall be assessed. R309-545-14.

(d) For each storage [~~reservoir~~]tank access that does not have a shoebox type lid with a minimum of a [~~2 inch~~]2-inch overlap, 3 points shall be assessed. R309-545-14(2).

(e) For each storage [~~reservoir~~]tank access that lacks a proper gasket between the lid and frame, 3 points shall be assessed. R309-545-14(2).

(f) For each storage [~~reservoir~~]tank access that lacks a minimum rise of 4 inches above the tank roof or a minimum of[~~(~~]18 inches above an earthen cover[~~)~~], 3 points shall be assessed. R309-545-14(1).

(g) For each storage [~~reservoir~~]tank that is not vented, 6 points shall be assessed. R309-545-15.

(h) For each finished water storage [~~reservoir~~]tank vent that is not [~~turned down~~]downturned or covered from rain and dust, 2 points shall be assessed. R309-545-15(1).

(i) For each storage [~~reservoir~~]tank vent that does not terminate a minimum of 24 [~~to 36~~]inches above the surface of the storage tank roof if the tank is a buried structure, 2 points shall be assessed. R309-545-15(2).

(j) For each storage [~~reservoir~~]tank vent that is not screened with number 14 non-corrodible mesh screen, [~~with a larger protection screen~~]2 points shall be assessed. R309-545-15(4).

(k) For each storage [~~reservoir~~]tank that lacks an overflow, 15 points shall be assessed. R309-545-13.

(l) For each storage [~~reservoir~~]tank overflow that does not terminated 12 to 24 inches above the ground, 5 points shall be assessed.R309-545-13.

(m) For each storage [~~reservoir~~]tank overflow that is not screened with number 4 non-corrodible mesh screen, 5 points shall be assessed. R309-545-13(3).

(n) For each storage [~~reservoir~~]tank overflow that is connected to a sewer system without an [~~appropriate~~]adequate air gap, 5 points shall be assessed. R309-545-13(5).

(o) For each storage [~~reservoir~~]tank with a drain that does not discharge through a physical airgap of at least 2 pipe diameters, 5 points shall be assessed. R309-545-10(1).

(p) For each storage [~~reservoir~~]tank with inadequate or improper means of site drainage or showing evidence of standing surface water within 50 feet of the tank, 5 points shall be assessed. R309-545-7(4).

(q) For each storage [~~reservoir~~]tank with any unsealed roof or wall penetrations, 50 points shall be assessed. R309-545-9(2).

(r) For each storage [~~reservoir~~]tank where the roof and sidewalls [~~are not water tight~~]show signs of deterioration, 10 to 50 points shall be assessed [~~10 to 50 points~~]based upon the size and number of cracks, the loss of structural integrity, and the access of contamination to the drinking water. R309-545-9(1).

(s) For each storage [~~reservoir~~]tank without [~~an~~]a safe access [~~ladder~~](such as ladders for tanks in excess of 20 feet, ladder guards, [~~balcony~~]or railings) or safely located entrance hatches, 2 points shall be assessed. R309-545-19(1), (2) and (3).

(t) For each storage [~~reservoir~~]tank with internal coatings not in compliance with ANSI/NSF standard 61[~~v~~], 30 points shall be assessed. R309-545-11.

(u) For a storage facility [~~which~~]that is not secured against unauthorized access, 20 points shall be assessed[~~20 points~~]. R309-545-14(3).

(8) Distribution System:

(a) A water system [~~which~~]that fails to provide [~~at least~~]the minimum water [~~pressure~~]pressures as required in R309-105-9 at all times and at all locations within the distribution system, 50 points shall be assessed [~~50 points~~]. R309-105-9 and R309-550-5(1).

(b) A water system using [~~unapproved~~]pipe and materials not meeting the ANSI/NSF 61 standard shall be assessed 30 points. R309-550-6.

(c) A water system with pipelines installed [~~improperly~~] without adequate [~~clearance or~~]separation distance from the sanitary sewer lines shall be assessed 30 points. R309-550-7.

(d) A new water system constructed after January 1, 2007 or an existing water system modification without adequate pressure as defined in R309-105-9(2) shall be assessed 50 points.

(e) A water system which has a distribution line that crosses under a surface water body without adequate protection as outlined in R309-550-8(8)(b) shall be assessed 50 points.

(f) A water system which has distribution system flushing devices, blow-offs or air relief valves, which are directly connected to a sewer or do not have a proper air gap, shall be assessed 20 points. R309-550-6 and R309-550-9.

(g) [~~A~~]For a water system that does not properly follow the AWWA disinfection standards [~~as adopted in R309-105-10(2) and (3)~~]10 points shall be assessed [~~10 points~~]. R309-550-8(10).

(h) [A]For a water system that is required by the local fire authority to provide fire protection or [~~supplies~~]has fire hydrants connected with water mains [~~that are~~]less than 8 [~~inched~~]inches in diameter, 5 points shall be assessed [~~5 points~~]. These points will only be assessed for water mains installed after 1995. R309-550-5(4) and (5).

(i) For each air [~~vacuum release~~]relief valve vent piping, which is not [~~properly~~]screened with a No. 14 mesh and [~~turned down~~]downturned, 10 points shall be assessed. R309-550-6(6)(b).

(j) For [~~each~~]an air [~~vacuum~~]release valve located in a chamber, if the air release valve [~~where the~~]discharge piping terminates less than 12 inches above grade or less than one foot above the top of the pipe where the chamber is not subject to flooding, [~~does not extend a proper distance above the ground and flood level~~]10 points shall be assessed. R309-550-6(6)(b).

(k) For each air [~~vacuum release valve~~]relief valve located in a chamber without a drain or adequate sump, or showing evidence of being subject to flooding, 30 points shall be assessed. R309-550-7.

[~~(l) For each air vacuum release valve chamber which shows evidence of flooding 30 points shall be assessed.~~]

([~~m~~]l) For each air vacuum release valve chamber [~~which~~]that is flooded at the time of inspection, 50 points shall be assessed.

(m) For an unprotected cross-connection in the distribution system as required in R309-550-9, 50 points shall be assessed.

(9) Quantity requirements

(a) A water system [~~which does not have~~]without sufficient source capacity to meet peak [~~daily~~]day and average yearly flow requirements, from 10 to 50 points shall be assessed[~~ from 10 to 50 points~~]. The number of points shall be based upon the severity of the shortage, including the number of times and duration of water outages or low pressure. R309-510-7.

(b) A water system [~~which does not have~~]without sufficient storage capacity to meet average [~~daily flow requirements~~]day demand,

plus the required fire suppression volume if applicable, 10 to 50 points shall be assessed[~~from 10 to 50 points~~]. The number of points shall be based upon the severity of the shortage including the number of times and duration of water outages. R309-510-8.

R309-400-7. Treatment Processes.

(1) General Treatment.

[~~(a) For a treatment facility with chemical feeders and pumps that operate at lower than 20 percent of the feed range 2 points shall be assessed. R309-525-11(7)(a)(viii).~~]

([~~b~~]a) For a treatment facility without anti-siphon control to assure that liquid chemical solutions cannot be siphoned through solution feeders into the process units, [~~as required in R309-525-11(9)(c)~~] 2 points shall be assessed. R309-525-11(9)(b)(ii) and (c).

([~~c~~]b) For a treatment facility with a process tank that is not properly labeled to designate the chemical contained, 2 points shall be assessed. R309-525-11(8)(c)(vii).

([~~d~~]c) For a treatment facility with chemicals not stored in covered or unopened shipping containers, unless the chemical is transferred into a covered storage unit, 2 points shall be assessed. R309-525-11(6)(a)(iii).

([~~e~~]d) For a treatment facility with no cross connection control provided to assure that no direct connections exist between any sewer and the drain or overflow from the feeder, solution chamber, or tank by providing that all pipes terminate at least six inches or two pipe diameters, whichever is greater, above the overflow rim of a receiving sump, conduit, or waste receptacle, [~~2~~]10 points shall be assessed. R309-525-11(9)(b)(iii).

([~~f~~]e) For a treatment facility with no spare parts available for all feeders to replace parts [~~which~~]that are subject to wear and damage, 2 points shall be assessed. R309-525-11(7)(b)(v).

[~~(g) For a treatment facility with chemical feed rates not proportional to flows 10 points shall be assessed. R309-525-11(7)(d)(ii).~~

~~(h) For a treatment facility with liquid chemical feeders without anti-siphon protection in each feed pump 2 points shall be assessed. R309-525-11(9)(c). Tg12~~

~~(i) For a treatment facility with feed lines not protected against freezing 2 points shall be assessed. R309-525-11(8)(d)(i)(C).~~

~~(j) For a treatment facility with feed lines not made of durable, corrosion resistant material 2 points shall be assessed. R309-525-11(8)(d)(i)(A).~~

~~(k) For a treatment facility with any chemical not conducted from the feeder to the point of application in a separate conduit 2 points shall be assessed. R309-525-11(7)(a)(v).~~]

([~~l~~]f) For a treatment facility where incompatible chemicals are fed, stored or handled together, 2 points shall be assessed. R309-525-11(7)(a)(iv).

([~~m~~]g) For a treatment facility where daily operating records do not reflect chemical dosages and total quantities used, 2 points shall be assessed. R309-105-14[~~(2)(a)~~](3).

([~~n~~]h) For a water system that fails to maintain and properly calibrate all instrumentation needed to verify the treatment process, 2 points shall be assessed. R309-525-25(4).

([~~o~~]i) For a treatment facility without the means to accurately measure the quantities of chemicals used, [~~2~~]20 points shall be assessed. R309-525-11(7)(a)(i) and R309-525-11(6)(b)(iii).

([~~p~~]j) A water system that does not keep acids and caustics in closed corrosion-resistant shipping containers or storage units, 2 points shall be assessed. R309-525-11(11)(a)(i).

([~~q~~]k) For a treatment facility that does not have the vent hose from the feeder to discharge to the outside atmosphere above grade or have the end covered with #14 non-corrodible mesh screen, 2 points shall be assessed. R309-520-[~~10(2)(f)~~]7(2)(f).

([~~r~~]l) For a treatment facility that uses any chemical that is added to water being treated for use in a public water system for human consumption that does not comply with ANSI/NSF Standard 60, 25 points shall be assessed. R309-525-11(5).

([~~s~~]m) For a treatment facility that does not have a finished water sampling tap(s), 2 points shall be assessed. R309-525-18.

([~~t~~]n) For a treatment facility that is not performing adequate process control testing consistent with the specific treatment process, 30 points shall be assessed. R309-525-19.

([~~u~~]o) For a surface water treatment facility that does not have continuous residual disinfection equipment to [~~measure continuously~~]measure the residual in mg/L entering the distribution system, 20 points shall be assessed. R309-215-10(1).

[~~(v) For a treatment facility without provisions for measuring quantities of chemical used to prepare feed solutions 50 points shall be assessed. R309-525-11(6)(b)(iii).~~]

([~~w~~]p) For a treatment facility without provisions for disposing of empty bags, drums or barrels by an acceptable procedure [~~which~~]that will minimize operator exposure to dusts, 2 points shall be assessed. R309-525-11(6)(b)[~~(ii)~~] and (c).

([~~x~~]q) For a treatment facility [~~which~~]that does not provide cross connection control on the make-up waterlines discharging to solution tanks, [~~5~~]10 points shall be assessed. R309-525-11(9)([~~c~~]b)(i).

([~~y~~]r) For a treatment facility with solution tank overflow pipes that do not have a free fall discharge or are not located where noticeable, 2 points shall be assessed. R309-525-11(8)(b)(v)[~~(A)~~].

[~~(z) For a treatment facility with subsurface locations for solution tanks that are not free from sources of possible~~

~~contamination 2 points shall be assessed. R309-525-11(8)(b)(iv)(A).~~

~~(z1) For a treatment facility with subsurface locations for solution tanks that do not assure positive drainage for ground waters, accumulated water, chemical spills and overflows 2 points shall be assessed. R309-525-11(8)(b)(iv)(B).~~

~~(z2) For a treatment facility with a motor driven transfer pump that is not provided a liquid level limit switch and an overflow from the day tank, which will drain by gravity back into the bulk storage tank 10 points shall be assessed. R309-525-11(8)(c)(v).~~]

([~~z3~~]s) For a treatment facility without adequate spill containment provisions, 2 points shall be assessed. R309-525-11(6)(a)(iv)(B)[~~(v)~~].

([~~z4~~]t) For a treatment facility with acid storage tanks that are not vented to the outside atmosphere with separate screened vents, 2 points shall be assessed. R309-525-11(8)(b)(vi).

[~~(z5) For a treatment facility without a means to measure the solution level in the tank 2 points shall be assessed. R309-525-11(8)(b)(ii).~~]

([~~z6~~]u) For a treatment facility without provisions for the proper disposal of water treatment plant waste (such as sanitary, laboratory, sludge, and filter backwash water), 5 points shall be assessed. R309-525-23.

[~~(z7) For a treatment facility that does not use of either a volumetric or gravimetric chemical feeder for dry chemicals 2 points shall be assessed. R309-525-11(7)(c)(i).~~]

([~~z8~~]v) For a [~~disinfection~~]treatment facility where cross connection control is not provided on the feed lines to the solution tanks, 10 points shall be assessed. [~~R309-520-10(1)(h)~~]R309-525-11(9)(b) and (c).

([~~z9~~]w) For a treatment facility that does not have a means to measure water flow rate, 10 points shall be assessed.

([~~z10~~]x) For a surface water treatment facility where the piping [~~feed lines are~~]is not labeled and color coded [~~for identification~~]to identify the direction of flow and the contained liquid, 2 points shall be assessed. R309-525-8.

([~~z11~~]y) [~~For a treatment facility which is~~]Treatment facilities not secured against unauthorized access, 20 points shall be assessed[~~- 20 points~~].

(z) For a treatment facility using expired chemical reagents for process control, 5 points shall be assessed.

(aa) For a treatment facility with no access to lab or test kits for process testing, 2 points shall be assessed. R309-525-17(1).

(bb) For a treatment facility lacking cross connection control for the in-plant water supply, 10 points shall be assessed. R309-525-11(9)(b)

(2) Disinfection.

(a) General.

[~~(a) For a disinfection facility without an automatic switch over of chlorine cylinders to assure continuous disinfection 2 points shall be assessed. R309-520-10(2)(a).~~

~~(b) For a disinfection facility without scales for weighing cylinders 2 points shall be assessed. R309-520-10(2)(k).~~

~~(c) For a disinfection facility without a leak repair kit for 1 ton cylinders 15 points shall be assessed. R309-520-[10](2)(p).~~

~~(d) For a disinfection facility without respiratory equipment available and stored at a convenient location 5 points shall be assessed. R309-520-10(2)(o).~~

~~(e) For a disinfection facility where the chlorine gas feed and storage area is not enclosed and separated from other operating areas 2 points shall be assessed. R309-520-10(2)(i).~~]

([~~f~~]i) For a [~~disinfection~~]chlorination facility which is not heated, lighted or ventilated as necessary to assure proper operation or the equipment and serviceability, 2 points shall be assessed. R309-520-[~~10~~]7(1)(l).

[~~(g) For a disinfection facility where the chlorination equipment rooms are not vented such that the ventilating fan(s) take suction near the floor, as far as practical from the door and air inlet, with the point of discharge so located as not to contaminate air inlets of any rooms or structures 5 points shall be assessed. R309-520-10(2)(e) (ii).~~

~~(h) For a disinfection facility where the chlorination equipment rooms are not vented such that air inlets are through louvers near the ceiling 2 points shall be assessed. R309-520-10(2)(e) (iii).~~

~~(i) For a disinfection facility where the chlorination equipment rooms are not vented such that louvers for chlorine room air intake and exhaust facilitate airtight closure 2 points shall be assessed. R309-520-10(2)(e) (iv).~~

~~(j) For a disinfection facility where the chlorination equipment rooms are not vented such that separate switches for the fans and lights are outside of the room, at the entrance to the chlorination equipment room and protected from vandalism 2 points shall be assessed. R309-520-10(2)(e) (iv).~~

~~(k) For a disinfection facility where the vent hose from the feeder to discharge to the outside atmosphere is not above grade or does not have the end covered with #14 non-corrodible mesh screen 2 points shall be assessed. R309-520-10(2)(f).~~

~~(l) For a disinfection facility without a bottle of ammonium hydroxide (56%) shall be available for leak detection 2 points shall be assessed. R309-520-10(2)(p).~~

~~(m) For a disinfection facility without full and empty cylinders of chlorine gas restrained in position to prevent upset 2 points shall be assessed. R309-520-10(2)(i).~~

~~(n) For a disinfection facility with full and empty cylinders of chlorine gas stored in rooms not separated from ammonia storage 2 points shall be assessed. R309-520-10(2)(i).~~

~~(o) For a disinfection facility with full and empty cylinders of chlorine gas stored in areas in direct sunlight or exposed to excessive heat 2 points shall be assessed. R309-520-10(2)(i).~~

~~(p) For a disinfection facility where the chlorine room is constructed in a manner that any openings between the chlorine room and the remainder of the plant are not sealed 2 points shall be assessed. R309-520-10(2)(h)(ii).~~]

~~(q) For a disinfection facility utilizing 1 ton cylinders without a means of leak detection available~~, ~~15 points shall be assessed. R309-520-10(2)(p).~~

[~~(r) For a disinfection facility without pressure gauges on the inlet and outlets of each chlorine injector 2 points shall be assessed. R309-520-10(2)(b).~~]

([~~s~~]ii) For a disinfection facility without cross connection control on the solution feeders into the process units as required in R309-525-11(9)(c), [~~5~~]10 points shall assessed. R309-525-11(9)(b)(ii).

([~~t~~]iii) For a [~~disinfection~~]chlorination facility where there is no standby disinfection equipment of sufficient capacity available to replace the largest unit, 10 points shall be assessed. R309-520-[~~10~~]7(1)(k).

[~~(u) For a disinfection facility where a leak detector is provided and not equipped with both an audible alarm and a warning light 5 points shall be assessed. R309-520-10(2)(p).~~]

(iv) For a disinfection facility where the correct reagent is not used for testing free disinfectant residual, 2 points shall be assessed. [~~R309-520-15(3).~~]

[~~(w) For a disinfection facility where hypochlorite liquid feeders are not a positive displacement type 10 points shall be assessed. R309-520-10(1)(b).~~]

([~~x~~]v) For a treatment facility where the pre- and post-chlorination [~~systems~~]processes are not independent of each other, to prevent possible siphoning of partially treated water into the clear well, 50 points shall be assessed. R309-525-11(9)(b)(iv).

[~~(y) For a disinfection facility where each tank is not provided with a valved drain or protected against backflow in accordance with R309-11(10)(b) and (c) 2 points shall be assessed. R309-525-11(8)(b)(vii).~~

~~(z) For a disinfection facility where overflow pipes are not located where they can be readily monitored 2 points shall be assessed. R309-520-10(1)(g).~~

~~(z1) For a disinfection facility where storage and day tanks are not provided with separate vents that terminate to the outside atmosphere 2 points shall be assessed. R309-525-11(8)(b)(vi).~~

~~(z2) For a disinfection facility where a means consistent with the nature of the chemical solution is not provided in a day tank to maintain a uniform strength of solution 2 points shall be assessed. R309-525-11(d)(8)(c)(iv).~~

~~(z3) For a disinfection facility where any chemical is not conducted from the feeder to the point of application in separate conduit 2 points shall be assessed. R309-525-11(7)(a)(v).~~]

([~~z4~~]vi) For a disinfection facility where chemical solution tanks are not kept covered, 2 points shall be assessed. R309-525-11(8)(b)(iii).

([~~z5~~]vii) For a disinfection facility without disinfectant residual test equipment, 2 points shall be assessed. R309-520-[~~10~~]7(1)(j).

([~~z6~~]viii) For a disinfection facility where there is no means to measure the volume of water treated, 2 points shall be assessed. R309-520-[~~10~~]7(1)(i).

[~~(z7) For a disinfection facility where provisions are not made for proper storage of sodium chlorite to eliminate any danger of explosion 2 points shall be assessed. R309-525-11(11) (b)(i).~~

~~(z8) For a disinfection facility where sodium chlorite is not stored by itself in a separate room and away from organic materials which would react violently with sodium chlorite 2 points shall be assessed. R309-525-11(11) (b)(i)(A).~~

~~(z9) For a disinfection facility where sodium chlorite storage structures are not constructed of noncombustible materials 2 points shall be assessed. R309-525-11(11)(a)(b)(i)(B).~~

~~(z10) For a disinfection facility where sodium chlorite storage structure is not located in an area where a fire may occur, water should be available to keep the sodium chlorite area sufficiently cool to prevent decomposition from heat and resultant potential explosive conditions 2 points shall be assessed. R309-525-11(11)(b)(i)(C).~~]

(b) Gas chlorination.

(i) For a gas chlorination facility without an automatic switch over of chlorine cylinders to assure continuous disinfection, 2 points shall be assessed. R309-520-7(2)(a).

(ii) For a gas chlorination facility without scales for weighing cylinders, 2 points shall be assessed. R309-520-7(2)(k).

(iii) For a gas chlorination facility without a leak repair kit, 15 points shall be assessed. R309-520-7(2)(p).

(iv) For a gas chlorination facility without respiratory equipment available and stored at a convenient location, 5 points shall be assessed. R309-520-7(2)(o).

(v) For a gas chlorination facility housed in a water treatment plant building where the chlorine gas feed and storage area is not enclosed and separated from other operating areas, 2 points shall be assessed. R309-520-7(2)(h).

(vi) For a gas chlorination facility where the chlorination equipment rooms are not vented such that the ventilating fan(s) take suction near the floor, as far as practical from the door and air inlet, with the point of discharge so located as not to contaminate air inlets of any rooms or structures, 5 points shall be assessed. R309-520-7(2)(e)(ii).

(vii) For a gas chlorination facility where the chlorination equipment rooms are not vented such that air inlets are through louvers near the ceiling, 2 points shall be assessed. R309-520-7(2)(e)(iii).

(viii) For a gas chlorination facility where the chlorination equipment rooms are not vented such that separate switches for the fans and lights are outside of the chlorine room, at the entrance to the chlorination equipment room and protected from vandalism, 2 points shall be assessed. R309-520-7(2)(e)(v).

(ix) For a gas chlorination facility where the vent hose from the feeder to discharge to the outside atmosphere is not above grade or does not have the end covered with #14 non-corrodible mesh screen, 2 points shall be assessed. R309-520-7(2)(f).

(x) For a gas chlorination facility without a bottle of ammonium hydroxide (56%) available for leak detection, 2 points shall be assessed. R309-520-7(2)(p).

(xi) For a gas chlorination facility where full and empty cylinders of chlorine gas are not restrained in position to prevent upset, 2 points shall be assessed. R309-520-7(2)(i)(ii).

(xii) For a gas chlorination facility with full and empty cylinders of chlorine gas stored in areas in direct sunlight or exposed to excessive heat, 2 points shall be assessed. R309-520-7(2)(i)(iii).

(xiii) For a gas chlorination facility in a water treatment plant building where the chlorine room is constructed in a manner that any openings between the chlorine room and the remainder of the plant are not sealed, 2 points shall be assessed. R309-520-7(2)(h)(ii).

(xiv) For a gas chlorination facility housed in a water treatment plant building that lacks outward-opening doors with panic bars, 2 points shall be assessed. R309-520-7(2)(h)(iii).

(xv) For a gas chlorination facility housed in a water treatment plant building with floor drains that do not discharge to the outside of the building and are not connected to other internal or external drain systems, 5 points shall be assessed. R309-520-7(2)(h)(iv).

(xvi) For a gas chlorination facility without a means of chlorine leak detection, such as a bottle of ammonia hydroxide solution or chlorine leak detection equipment, 15 points shall be assessed. R309-520-7(2)(p).

(c) Chlorine dioxide.

(i) For a chlorine dioxide disinfection facility where provisions are not made for proper storage of sodium chlorite to eliminate any danger of explosion 2 points shall be assessed. R309-520-10(3)(b) and R309-525-11(11)(b)(i).

(ii) For a chlorine dioxide disinfection facility where sodium chlorite is not stored by itself in a separate room and away from organic materials that would react violently with sodium chlorite, 2 points shall be assessed. R309-520-10(5)(a) and R309-525-11(11)(b)(i)(A).

(iii) For a chlorine dioxide disinfection facility where sodium chlorite storage structures are not constructed of noncombustible materials, 2 points shall be assessed. R309-520-10(3)(b)(iv) and R309-525-11(11)(b)(i)(B).

(iv) For a chlorine dioxide disinfection facility where a sodium chlorite storage structure is not located in an area where a fire may occur, water should be available to keep the sodium chlorite area sufficiently cool to prevent decomposition from heat and resultant potential explosive conditions. 2 points shall be assessed if this is not the case. R309-520-10(4)(d) and R309-525-11(11)(b)(i)(C).

(v) For a chlorine dioxide disinfection facility that stores combustible or reactive materials in the operating area, 2 points shall be assessed. R309-520-10(5)(a).

(vi) For a chlorine dioxide disinfection facility that does not store personal protective equipment nearby, 5 points shall be assessed. R309-520-10(5)(c)

(vii) For a chlorine dioxide disinfection facility that does not have an emergency eyewash and shower immediately outside the operating area, 2 points shall be assessed. R309-520-10(3)(b)(viii)

(viii) For a chlorine dioxide disinfection facility that lacks an emergency shutoff for flows to the chlorine dioxide generator, 2 points shall be assessed. R309-520-10(3)(b)(ix)

(ix) For a chlorine dioxide disinfection facility that lacks a distinguishable alarm triggered by an ambient air chlorine dioxide sensor, 2 points shall be assessed. R309-520-10(3)(b)(v)

(x) For a chlorine dioxide disinfection facility that lacks wash down water available in the operating area, 2 points shall be assessed. R309-520-10(3)(b)(xvi)

(xi) For a chlorine dioxide disinfection facility that does not maintain the temperature of the chlorine dioxide operating area between 60 and 100°F, 2 points shall be assessed. R309-520-10(5)(d)

(xii) For a chlorine dioxide disinfection facility that lacks an Operation and Maintenance Manual including safety and emergency response procedures, 2 points shall be assessed. R309-520-10(5)(f)

(d) Ultraviolet (UV)

(i) For a UV disinfection facility that lacks an operating procedure in place to handle UV lamp breakage, power supply interruption, response to alarms, 2 points shall be assessed. R309-520-8(4)(b)

(ii) For a UV disinfection facility that does not calibrate and operate UV intensity sensors per manufacturer’s instruction, 2 points shall be assessed R309-520-8(4)

(iii) For a UV disinfection facility that does not use ANSI/NSF Standard 60 chemicals in the cleaning of the UV, 25 points shall be assessed. R309-520-8(3)(j)

(iv) For a UV disinfection facility that can’t isolate the UV disinfection system or each UV reactor for maintenance, 2 points shall be assessed. R309-520-8(3)(g)

(v) For a UV disinfection facility that lacks a backup power source for the UV disinfection system, 2 points shall be assessed. R309-520-8(3)(l)

(vi) For a UV disinfection facility that lacks a redundant primary disinfection mechanism, 5 points shall be assessed. R309-520-8(3)(m)

(e) Ozone

(i) For an ozone disinfection facility without a minimum of two ozone aqueous residual analyzers, 2 points shall be assessed. R309-520-9(7)(c)

(ii) For an ozone disinfection facility using chemicals that do not meet ANSI/NSF Standard 60 quench the residual ozone, 25 points shall be assessed. R309-520-9(4)(h)

(iii) For an ozone disinfection facility lacking properly functioning ozone off-gas blowers from the contactor, 2 points shall be assessed. R309-520-9(5)(b)

(iv) For an ozone disinfection facility that lacks a system for treating the final off-gas from each ozone contactor, 2 points shall be assessed. R309-520-9(5)(a)

(v) For an ozone disinfection facility discharging an ozone concentration in the gas discharge exceeding 0.1 ppm by volume, 2 points shall be assessed. R309-520-9(5)(d)

(3) Fluoridation.

(a) General

([~~a~~]i) For a fluoridation facility that does not calculate fluoride concentrations, including chemical dosages and total water quantities[~~,~~] daily, 2 points shall be assessed. R309-105-14[~~(2)(a)~~](3).

([~~b~~]ii) For a fluoridation facility [~~where there is not~~]without a fail-safe device incorporated in the fluoride feed control system to prevent overfeeding fluoride, 30 points shall be assessed. R309-535-5(3).

([~~c~~]iii) For a fluoridation facility that uses fluoride chemicals [~~sodium fluoride, sodium silicofluoride and fluoriosilicic acid~~]that [~~does~~]do not conform to the applicable AWWA standards or with ANSI/NSF Standard 60, 25 points shall be assessed. R309-535-5.

[~~(d) For a fluoridation facility where liquid chemical storage tanks are not equipped with an inverted "J" air vent 2 points shall be assessed. R309-525-11(6)(a)(iv)(c).~~

~~(e) For a fluoridation facility where the make-up water is not properly treated for hardness 2 points shall be assessed. R309-535-5(2)(i).~~

~~(f) For a fluoridation facility with no provisions for the proper disposal of water treatment plant waste (such as sanitary, laboratory, sludge, and filter backwash water) 5 points shall be assessed. R309-525-23.~~

~~(g) For a fluoridation facility without a spring opposed diaphragm type anti-siphon device shall be provided for all fluoride feed lines and dilution water lines 10 points shall be assessed. R309-535-5(2)(f).~~

~~(h) For a fluoridation facility with saturators that do not have a flowmeter on the inlet or outlet line 2 points shall be assessed. R309-535-5(2)(l).~~

~~(i) For a fluoridation facility without an adequate level of fluoride crystals in the saturator 2 points shall be assessed. R309-525-11(d)(8)(b)(i).~~

~~(j) For a fluoridation facility without NIOSH/MSHA certified dust respirator approved for fluoride dust removal as required in R309-525-11(10) for operators handling fluoride compounds 2 points shall be assessed. R309-535-5(4).~~]

([~~k~~]iv) For a fluoridation facility without scales, loss-of-weight recorders or liquid level indicators, as appropriate, 2 points shall be assessed. R309-535-5(2)(a).

[~~(l) For a fluoridation facility without deluge showers and eye wash devices 2 points shall be assessed. R309-535-5(4).~~]

([~~m~~]v) For a fluoridation facility without proper personal protective equipment as required in R309-525-11(10) [~~-~~]for operators handling fluoride compounds, [~~2~~]10 points shall be assessed. R309-535-5(4).

[~~(n) For a fluoridation facility where an overflow from the day tank will not drain by gravity back into the bulk storage tank or a containment system 10 points shall be assessed. R309-525-11(8)(c)(v).~~

~~(o) For a fluoridation facility where the saturators are not of the up-flow type 2 points shall be assessed. R309-535-5(2)(l).~~]

(vi) For a fluoridation facility lacking a sampling location for measuring the final fluoride level, 2 points shall be assessed. R309-525-18.

(vii) For a fluoridation facility that does not have a means to measure the flow of water to be treated, 2 points shall be assessed. R309-535-5(2)(g).

(viii) For a fluoridation facility without fluoride testing equipment not properly verified or calibrated, 2 points shall be assessed. R309-525-25(4).

(ix) For a fluoride facility adding fluoride compound before lime-soda softening, 2 points shall be assessed. R309-535-5(2)(c).

(x) For a Fluoridation facility lacking cross connection control so that no direct connections exist between any sewer and a drain or overflow from the feeder, solution chamber or tank, 10 points shall be assessed. R309-525-11(9)(b)(iii).

(xi) For a fluoridation facility storing incompatible chemicals in the fluoride storage or injection areas, 10 points shall be assessed. R309-525-11(7)(a)(iv).

(xii) For a fluoridation facility lacking a floor drain to facilitate the washdown of floors, 2 points shall be assessed. R309-535-5(5)(b)

(b) Acid

(i) For a fluoridation facility without deluge showers and eye wash devices, 10 points shall be assessed. R309-535-5(4).

(ii) For a fluoridation facility lacking adequate spill containment provisions, 2 points shall be assessed R309-525-11(6)(a)(iv)(B).

(iii) For a fluoridation facility lacking a vent in the fluorosilicic acid storage units that vents to the atmosphere, 2 points shall be assessed. R309-525-11(8)(b)(vi).

(c) Dry

(i) For a fluoridation facility where the make-up water used for sodium fluoride dissolution is not treated to reduce hardness to less than 75 mg/l as calcium carbonate, 2 points shall be assessed. R309-535-5(2)(i).

(ii) For a fluoridation facility without a spring opposed diaphragm type anti-siphon device for all fluoride feed lines and dilution water lines, 10 points shall be assessed. R309-535-5(2)(f).

(iii) For a fluoridation facility with saturators that do not have a flow meter on the inlet or outlet line, 2 points shall be assessed. R309-535-5(2)(l).

(iv) For a fluoridation facility without an adequate level of fluoride crystals in the saturator, 2 points shall be assessed. R309-525-11(8)(b)(i).

(v) For a fluoridation facility without a NIOSH/MSHA certified dust respirator approved for fluoride dust removal as required in R309-525-11(10) for operators handling dry fluoride compounds, 10 points shall be assessed. R309-535-5(4).

(vi) For a fluoridation facility where an overflow from the day tank will not drain by gravity back into the bulk storage tank or a containment system, 10 points shall be assessed. R309-525-11(8)(c)(v).

(vii) For a fluoridation facility using the sodium fluoride dry chemical where the saturators are not of the up-flow type, 2 points shall be assessed. R309-535-5(2)(l).

(viii) For a fluoride facility where fluoride chemicals stored in uncovered or opened shipping containers and are stored inside a building on pallets, 2 points shall be assessed. R309-535-5(1).

(ix) For a fluoride feed pump that is not tied directly to the well pump or service pump, 30 points shall be assessed. R309-535-5(2)(k).

(x) For a fluoridation facility lacking a vent in the dry chemical storage areas that vents to the atmosphere outside the building, 2 points shall be assessed. R309-535-5(5)(a).

(xi) For a fluoridation facility using sodium fluoride dry chemical and lacking a hopper equipped with an exhaust fan and dust filter and under a negative pressure during transfer of dry fluoride compounds, 10 points shall be assessed. R309-535-5(5)(a).

(xii) For a fluoridation facility that does not vent air from fluoride handling equipment through a dust filter to the outside atmosphere of the building for dust control during transfer of dry fluoride compounds, 10 points shall be assessed. R309-535-5(5)(a).

(xiii) For a fluoridation facility using sodium fluoride dry chemical and lacking a means of disposing of empty bags, drums or barrels handled in a manner that minimizes operators' exposure to fluoride dusts shall be assessed, 10 points. R309-535-5(5)(b).

[~~(4) Activated Carbon.~~

~~(a) For a treatment facility that does not periodically check media depth against design standards 10 points shall be assessed. R309-525-19.~~

~~(b) For a treatment facility that does not have a standard operating practice for the backwash procedure 10 points shall be assessed. R309-525-19.~~

~~(c) For a treatment facility that does not provide cross connection control for the in-plant water supply 2 points shall be assessed. R309-525-11(9)(b).~~

~~(d) For a treatment facility where the output of any chemical pump is inadequate to supply the required dose rate 2 points shall be assessed. R309-525-11(7)(a)(i).~~

~~(e) For a treatment facility where the in plant water supply is inadequate in pressure and quantity 2 points shall be assessed. R309-525-11(9)(a).~~

~~(f) For a treatment facility where the vents from feeders, storage facilities and equipment exhaust does not discharge to the outside atmosphere above grade and does not have the end covered with #14 non-corrodible mesh screen 2 points shall be assessed. R309-520-10(2)(f).~~]

([~~5~~]4) Filtration Treatment.

(a) For a filtration facility that does not have equipment for each individual filter to continuously monitor the effluent turbidity, 30 points shall be assessed.

(b) [~~For a filtration facility that does not provide a minimum backwash rate of 15 gpm/sf for conventional filters 50 points shall be assessed.~~]For a surface water filtration facility that does not have at least two filter units, each capable of meeting the plant design capacity, 20 points shall be assessed. R309-525-15(3).

(c) For a conventional surface water filtration facility that does not have the ability to filter to waste (to allow a filter to ripen before introduction finished water into the clearwell), [~~50~~]20 points shall be assessed

(d) For a filtration facility where instrumentation and controls are inoperable, 2 points shall be assessed.

(e) For a filtration facility where a backwash tank is not provided with finished drinking water, 20 points shall be assessed. R309-525-15(7)(a)(ix).

(f) For a conventional surface water filtration facility where the backwash waste water is not settled prior to being recycled to the head of the treatment plant, 2 points shall be assessed. R309-525-15(7)(a).

(g) For a membrane filtration facility where automatic membrane integrity tests are not performed at least daily, 2 points shall be

assessed. R309-530-8(3)(b).

(h) For a membrane filtration facility not using ANSI/NSF 60 approved chemicals, 25 points shall be assessed. R309-525-11(5)(b).

(i) For a membrane filtration facility lacking cross-connection control protection for the treatment process, 10 points shall be assessed.

(5) Ion Exchange

(a) For an ion exchange facility without a depth of the exchange resin at least 3 feet, 2 points shall be assessed. R309-535-8(1)(b)(iii).

(b) For an ion exchange facility using a salt for the brine solution not having an ANSI/NSF 60 certification, 25 points shall be assessed R309-525-11(5)(b).

(c) For an ion exchange facility make-up water inlet that lacks protection from back-siphonage, 2 points shall be assessed

(d) For an ion exchange facility where the overflow discharge piping is not protected with a corrosion resistant screen or is not terminated with a downturned bend with adequate clearance to prevent cross connection, 10 points shall be assessed. R309-525-11(9)(b).

(e) For an ion exchange facility that lacks a brine measuring tank or means of metering provided to obtain proper dilution, 2 points shall be assessed. R309-525-11(8)(b)(i).

(6) Sequestration

(a) For a polyphosphate sequestration facility that uses chemicals not meeting ANSI/NSF 60 certification, 25 points shall be assessed. R309-535-11(5)(d).

(b) For a sequestration facility using phosphate chemicals where total phosphate applied exceed 10 milligrams per liter as PO4, 2 points shall be assessed. R309-535-11(5)(b).

(c) For a sequestration facility that lacks sample taps located on each raw water source, each treatment unit influent and each treatment unit effluent, 2 points shall be assessed. R309-535-11(5)(d).

(d) For a sequestration facility that lacks the testing equipment for accurately measuring the phosphate dosage, 2 points shall be assessed. R309-535-11(5).

R309-400-8. Operator Certification.

(1) A water system that is required to have a certified operator and does not, 30 points shall be assessed[~~30 points~~].

(2) A water system where the operator is not certified at the appropriate level, 10 points shall be assessed[~~10 points~~].

(3) A grade 3 or 4 water system that does not have all direct responsible charge operators (as specified in R309-300-5(5)) certified at the level of the system, 5 to 15 points shall be assessed[~~5 to 15 points~~]. The number of points shall be based on the percentage of time that the water system is operated by operators not certified at the required level.

(4) A water system where the certified operator does not live within a one hour response time, 20 points shall be assessed[~~20 points~~].

(5) A water system may be credited up to a maximum of 20 points, which shall remain on record for as long as the conditions apply. The following items are eligible for credit:

(a) A water system that is not required to have a certified operator and does shall be credited 10 points.

(b) A water system that has operators that are certified at a higher level than required shall be credited 10 points.

(c) A water system that has operators certified in other areas that are not required by that water system, such as treatment [~~or backflow prevention certification,~~]shall be credited 10 points.

R309-400-9. Cross Connection Control Program.

(1) A water system, which does not have any of the below listed components of a cross connection control program in place, 50 points shall be assessed[~~50 points~~].

(2) A water system, which only has some of the components of a cross connection control program in place, shall be assessed the following number of points:

(a) A water system which does not have local authority to enforce a cross connection control program ([~~i.e.~~]e.g., ordinance, bylaw or policy), 10 points shall be assessed[~~10 points~~].

(b) A water system that does not provided public education or awareness material or presentations on an annual basis, 10 points shall be assessed[~~10 points~~].

(c) A water system that does not have an operator with training in the area of cross connection control or backflow prevention, 10 points shall be assessed[~~10 points~~].

(d) A water system with no written records of cross connection control activities, such as, backflow assembly inventory and test history, 10 points shall be assessed[~~10 points~~].

(e) A water system that does not have on-going enforcement activities (hazard assessments and enforcement actions), 10 points shall be assessed[~~10 points~~].

R309-400-10. Drinking Water Source Protection.

Drinking water source protection (for ground water and surface water sources): Points shall be assessed for each source after a system fails to complete source protection [~~plans as~~]requirements according to schedules or deadlines specified in R309-600 and R309-605, unless extensions have been requested from and granted by the Director. The points shall remain until such time as the violation or deficiency [~~no longer exists~~]is corrected or resolved.

(1) For a water system [~~which~~]that has not appointed a designated person for source protection and notified the Division, 5 points shall be assessed.

(2) For a water system [~~which does not maintain a current copy~~

~~of their source protection plan(s) or source assessment(s) on the water system premises~~]that has not upgraded a Preliminary Evaluation Report to a Drinking Water Source Protection plan, 30 points shall be assessed.

(3) For a water system [~~which does not maintain a current inventory of potential contamination sources or susceptibility analysis and determination~~]that has not submitted an updated Drinking Water Source Protection plan, 10 points shall be assessed.

[~~(4) For a water system which does not maintain current records of land management strategies (such as, ordinances, codes, permits, public education programs, meeting minutes) 10 points shall be assessed.~~]

(4[~~5~~]) For a water system with any new (see R309-110) sources for which a Preliminary Evaluation Report has not been submitted, 150 points shall be assessed. These points shall be included with the points for an unapproved source, not [~~in addition to~~]added to them.

(5[~~6~~]) For a water system [~~which~~]that has any [~~old~~]existing (see R309-110) sources that have come into use for which a source protection plan has not been submitted, 30 points shall be assessed.

(6[~~7~~]) For a water system [~~which~~]that has reconstructed or redeveloped a water source and has not submitted a revised source protection plan, 20 points shall be assessed.

(7) For a water system that has a disapproved plan, update or Preliminary Evaluation Report, 20 points shall be assessed.

R309-400-11. Administrative Issues.

Points in this area shall be assessed at the time that the failure occurs or upon notification of the Director, and shall remain until the issue is resolved unless otherwise specified.

(1) Administrative Data -

(a) A water system, [~~which~~]that has not designated a person or organizational official responsible for the system including a current address and phone number,10 points shall be assessed[~~-10 points~~].

(b) A water system project constructed without proper plan approval, [~~shall be assessed 1 to~~]50 to 200 points shall be assessed based on an evaluation of the project which shall include the structural or engineering integrity of the project; whether the plans and specifications were prepared and stamped by a licensed professional engineer; the adequacy of the materials used and the impact on the operation of the water system (good or bad). [~~The points assessed shall remain on record for a period of one year.~~]

(2) A water system with a current written Emergency Response Program shall be credited 10 points that shall remain on record as long as the Program remains current.

(3) A water system with a written Financial Management Plan including an appropriate rate structure, infra-structure replacement fund, and master plan shall be credited 10 points that shall remain on record as long as the Plan is current.

(4) Sampling Site Plans:

(a) A water system, which does not have an adequate bacteriological sampling site plan, 5 points shall be assessed[~~5 points~~].

(b) A water system, which does not have a lead/copper sampling site plan, 10 points shall be assessed[~~10 points~~].

(5) Customer Complaint:

(a) [~~1~~]25 to 100 points may be assessed for valid and documented customer complaints. The customer complaints include but are not limited to the following:

(i) Turbidity;

(ii) Pressure;

(iii) Taste and Odor;

(iv) Sickness (water suspected); and

(v) Waterborne Disease Outbreak (R309-104-9).

(vi) Periods of Water Outage

(b) The number of points shall be based upon the extent and documentation of the problem and the potential impact to public health. The documentation shall consist of an investigation by Department of Environmental Quality, Department of Health or Local Health Department personnel and may include an epidemiological study linking the drinking water to reported outbreaks of illness where appropriate.

(c) In the case of a documented waterborne disease outbreak, the water system shall automatically be rated Not Approved for at least the duration of the threat to the quality of the drinking water and as long as it takes the water system to correct any deficiency that caused the outbreak.

(d) Points shall only be assessed once per issue and shall not be additive based on the number of calls per issue. These points shall be assessed and updated upon verification of the complaint by the Director and shall remain on record until the issue or deficiency no longer exists. Points may have already been assessed in other areas as appropriate.

(6) (a) The Director may issue directives to a water system that include, but are not limited to the following:

(i) Administrative Orders;

(ii) Rule defined action;

(iii) Rule defined compliance schedule;

(iv) Variance/Exemption requirements; [~~and~~]

(v) Bilateral Compliance Agreement[~~.~~];

(vi) Notice of Violation and Compliance Order; and

(vii) Compliance Action/Enforcement Order.

(b) If the water system does not comply with the directive, the Director may assess [~~1~~]25 to [~~100~~]200 points to the water system. Points shall be assessed based upon the severity of the non-compliance, the threat to public health and the underlying basis for the original directive.

(7) Data Falsification - The Director may assess a water system points for data falsification. The water system may be assessed [~~1~~]25 to [~~50~~]200 points for each occurrence based upon:

(a) the severity of the falsification;

(b) the threat to public health;

(c) the intent of the water system personnel; and,

(d) the type of falsification.

(i) Reports only good data

(ii) Doctored results from the laboratory

(iii) Non-valid sample

Data reported to the Director includes but is not limited to Water Treatment Plant Reports, Disinfection Reports, bacteriological and chemical analyses, and Annual Reports. This assessment of points shall be in addition to any other penalty provided by law.

(8) Water Hauling:

(a) For a community water system that is hauling water as a permanent method of culinary water distribution, 150 points shall be assessed. R309-550-10(1).

(b) For a non-community system that is hauling water as a permanent method of culinary water distribution [~~when there is alternate means of supplying quality drinking water~~]without approval from the director, 150 points shall be assessed. R309-550-10(2).

(c) For a water system, which has been granted an exception to haul water, if any part of the water hauling guidelines [~~are~~]is not followed, 50 points shall be assessed. R309-550-10.

R309-400-12. Reporting and Record Maintenance Issues.

Points may be assessed for failure to provide required reports to the Director by the reporting deadline. The points shall be assigned as the failure occurs and shall remain on record for a period of one year.

(1) Monthly Reports:

(a) For each failure to report the monthly water treatment plant report, [~~10~~]100 points shall be assessed.

(2) Quarterly [~~Repots~~]Reports:

(a) For each failure to report the quarterly disinfection report, [~~10~~]50 points shall be assessed.

(3) Annual Reports:

(a) For failure to provide the annual report, 2 points shall be assessed.

(b) [~~For a community~~]Community water [~~system~~]systems that [~~fails~~]fail to [~~prepare or distribute a~~]send a certification to the Division stating how the consumer confidence report was distributed to its customers as required in R309-225-7(3), [~~2~~]10 points shall be assessed.

(c) Community water systems that fail to mail a copy of the consumer confidence report to the Division as required in R309-225-7(3), 10 points shall be assessed.

KEY: drinking water, environmental protection, water system rating, penalties
Date of Enactment or Last Substantive Amendment: March 6, 2007
Notice of Continuation: March 22, 2010
Authorizing, and Implemented or Interpreted Law: 19-4-104

Agenda Item 7(B)

RULE ADOPTION FOR
CHANGE IN PROPOSED RULE *R309-545*

On May 9, 2014, the Drinking Water Board authorized the Division staff to initiate the rule-making process for revising R309-545. R309-545 governs the design and construction requirements related to drinking water storage tanks.
The original proposed modifications to *R309-545* include the following:

- Eliminate redundant references to sizing and exception requests.
- Revise to use the same terminology throughout the rule (tank vs. reservoir, etc.).
- Modify the rule to require a means to drain the tank.
- Clarify recommendations versus requirements (should, shall, etc.)
- Add requirements for curing procedures and volatile organic compound sampling for tank coating.
- Add requirement that the tank venting capacity shall exceed the water flow.
- Eliminate the requirement for a screen protector on vent lines that are smaller than 6 inches in diameter.

The public comment period for the original rule revision was from June 1, 2014, to July 1, 2014. Several comments were received during this period. To address the comments received, the Board authorized staff to proceed with the "Change in Proposed Rule" on July 18, 2014. The comment period for the "Change in Proposed Change" was from August 15 to September 15, 2014. The modifications included in the Change in the Proposed Rule to *R309-545* include the following:

- Clarify that standing water is not allowed around ground-level or buried tanks.
- Clarify that flood elevation requirement applies to ground-level and buried tanks.
- Revise the term "water line" under access openings to "level of the overflow" to clarify that we are referring the level of water in the tank and not a pipe.
- Eliminate "incorporated by reference," so that additional standards do not have to be obtained and filed with DAR.

No comments were received on the Change in the Proposed Rule.

Two versions of the R309-545 revision are enclosed:

The Division of Administrative Rules (DAR) maintains the official version of the rules and oversees the rulemaking process. The DAR format does not contain any indentation.

- The Division of Drinking Water (DDW) has chosen to provide a DDW version of the rule to the public. The rule content of the DDW version is the same as the DAR version. The DDW version is formatted for easier reading (with indentation) and contains DDW's interpretations of the rule (in the form of guidance paragraphs). These guidance paragraphs are not considered part of the official rule.

Staff Recommendation: The Staff recommends the Board adopt the Change in Proposed Rule to R309-545 and authorize staff to make this rule change effective on November 10, 2014.

R309-545 Facility Design and Operation: Drinking Water Storage Tanks

Table of Contents

R309-545. Facility Design and Operation: Drinking Water Storage Tanks.

R309-545-1. Purpose.

The purpose of this rule is to provide specific requirements for public drinking water storage tanks. It is intended to be applied in conjunction with other rules, specifically R309-500 through R309-550. Collectively, these rules govern the design, construction, operation, and maintenance of public drinking water system facilities. These rules are intended to assure that facilities are reliably capable of supplying water in adequate quantities, which consistently meeting applicable drinking water quality requirements and not posing a threat to general public health.

R309-545-2. Authority.

This rule is promulgated by the Drinking Water Board as authorized by Title 19, Environmental Quality Code, Chapter 4, Safe Drinking Water Act, Subsection 104(1)(a)(ii) of the Utah Code, and in accordance with Title 63G, Chapter 3 of the same, known as the Administrative Rulemaking Act.

R309-545-3. Definitions.

Definitions for certain terms used in this rule are given in R309-110 but may be further clarified herein.

R309-545-4. General.

Storage for drinking water shall be provided as an integral part of each public drinking water system unless an exception to the rule is approved by the Director. Pipeline volume in transmission or distribution lines shall not be considered part of any storage volumes.

R309-545-5. Size of Tank(s).

Storage tanks shall be sized in accordance with the required minimums of R309-510.

R309-545-6. Tank Material and Structural Adequacy.

(1) Materials.

The materials used in drinking water storage tanks shall provide stability and durability as well as protect the quality of the stored water. Steel tanks shall be constructed from new, previously unused plates and designed in accordance with AWWA Standard D100-11.

(2) Structural Design.

The structural design of drinking water storage tanks shall be sufficient for the environment in which they are located.

Guidance: Division review of plans and specifications for storage tanks does not include an evaluation of structural suitability. Certification of structural adequacy may be requested from the design engineer before approval is granted.

R309-545-7. Location of Tanks.

(1) Pressure Considerations.

The location of the tank and the design of the water system shall be such that the minimum working pressure in the distribution system shall meet the minimum pressures as required in R309-105-9.

Guidance: The expected water level variation in the tank should be taken into account when considering minimum and maximum distribution system pressures. The maximum variation between high and low water levels in storage tanks that provide pressure to a distribution system should not exceed 30 feet.

(2) Connections.

Tanks shall be located at an elevation where present and anticipated connections can be adequately served. System connections shall be placed at elevations such that minimum pressures, as required in R309-105-9, will be continuously maintained.

(3) Sewer Proximity.

Sewers, and similar sources of possible contamination shall be kept at least 50 horizontal feet from the tank.

(4) Standing Surface Water.

The area surrounding a ground-level or buried drinking water storage tank shall be graded in a manner that will prevent surface water from standing within 50 horizontal feet of the tank.

(5) Ability to Isolate.

Drinking water storage tanks shall be designed and located so that they can be isolated from the distribution system. Storage tanks shall be capable of being drained for cleaning or maintenance. Where possible, tanks shall be designed with the ability to be isolated without loss of pressure or service in the distribution system.

(6) Earthquake and Landslide Risks.

Potential geologic hazards shall be taken into account in selecting a tank location. Earthquake and landslide risks shall be evaluated.
Guidance: The design may include special shut-off or isolation valves designed to react in the event of an earthquake.

(7) Security.

The site location and design of a drinking water storage tank shall take into consideration security issues and potential for vandalism.

Guidance: Fencing is advisable where the tank is highly accessible to the public or livestock. Where electricity or telemetry is available, consideration should be given to the installation of electronic security equipment.

R309-545-8. Tank Elevation and Burial.

(1) Flood Elevation.

The bottom of a ground-level or buried drinking water storage tank shall be located at least 3 feet above the 100-year flood level or the highest known maximum flood elevation, whichever is higher.

(2) Ground Water.

When the bottom of a drinking water storage tank will be placed below the normal ground surface, it shall be placed above the local ground water table.

Guidance: It is recommended that a french drain system be considered around any buried storage tank, but especially if the ground water table elevation is unknown or may exhibit seasonal variations.

(3) Covered Roof.

When the roof of a drinking water storage tank will be covered by earth, the roof shall be sloped to drain toward the outside edge of the tank.

R309-545-9. Tank Roof and Sidewalls.

(1) Protection From Contamination.

All drinking water storage tanks shall have suitable watertight roofs and sidewalls that shall also exclude birds, animals, insects, and excessive dust.

(2) Openings.

Openings in the roof and sidewalls shall be kept to a minimum and shall comply with the following:

(a) Any pipes running through the roof or sidewall of a metal drinking water storage tank shall be welded, or properly gasketed. In new concrete tanks, these pipes shall be connected to standard wall castings with seepage rings that have been poured in place. Vent pipes, in addition to seepage rings, shall have raised concrete curbs that direct water away from the vent pipe and are formed as a single pour with the roof deck. Roof drains or any other pipes, which may contain water of lesser quality than drinking water, shall not penetrate the roof, walls, or floor of a drinking water storage tank.

(b) Openings in a storage tank roof or top, designated to accommodate control apparatus or pump columns, shall be welded, gasketed, or curbed and sleeved as above, and shall have additional proper shielding to prevent vandalism.

Guidance: Valves and controls should be located outside the storage tank so that the valve stems and similar projections will not pass through the roof or top of the tank.

(3) Adjacent Compartments.

Drinking water shall not be stored or conveyed in a compartment adjacent to wastewater when the two compartments are separated by a single wall.

(4) Roof Drainage.

The roof of all storage tanks shall be designed for drainage to eliminate water ponding. Parapets, or similar structures, which would tend to hold water and snow, shall not be allowed/permitted unless adequate waterproofing and drainage are provided. Downspout or roof drain pipes shall not enter or pass through the tank.

R309-545-10. Internal Features.

The following shall apply to internal features of drinking water storage tanks:

(1) Drains.

(a) A means shall be provided for the draining of drinking water storage tanks.

(b) Where possible, the drain shall be separate from the outlet pipeline. If a tank drain line is provided, it shall be sloped for complete drainage.

(c) The drain shall not discharge to a sanitary sewer.

(d) If local authority allows discharge to a storm drain, the drain discharge shall have a physical clearance of at least 12 inches between the discharge end of the pipe and the overflow rim of the receiving basin.

Guidance: A "means" to drain the storage tank can include a separate drain line, the

ability to drain through a downstream hydrant or at a location with a significant elevation difference from the tank floor, or pumping out the water. It is recommended that the drain line be screened with No. 4 screen.

(2) Internal Catwalks.

Internal catwalks, if provided and located over the drinking water, shall have a solid floor with raised edges. The edges and floor shall be designed so that shoe scrapings or dirt will not fall into the drinking water.

(3) Inlet and Outlet.

(a) To minimize potential sediment in the flow from the tank, the outlet pipes from all tanks shall be located in a manner to provide a silt trap prior to discharge into the distribution system.

(b) Inlet and outlet pipes shall be configured to provide mixing and circulation.

Guidance: Internal baffling, special spray nozzles, bends, or mixing valves may also be needed in order to minimize the possibility of short circuiting through the tank depending on the size and shape of the tank and the flow.

(4) Tank Floor.

The floor of the storage tank shall be sloped to permit complete drainage of the structure.

R309-545-11. Internal Surfaces and Coatings

(1) ANSI/NSF Standard 61 Certification.

All interior surfaces and coatings shall comply with ANSI/NSF Standard 61 or other standards approved by the Director. This requirement applies to any pipes and fittings, protective materials (e.g., paints, coatings, concrete admixtures, concrete release agents, or concrete sealers), joining and sealing materials (e.g., adhesives, caulks, gaskets, primers and sealants) and mechanical devices (e.g., electrical wire, switches, sensors, valves, or submersible pumps) that may come into contact with the drinking water.

(2) Curing Procedures and Volatile Organic Compounds.

(a) Proper curing procedures shall be followed per manufacturer's directions, including curing time, temperature, and forced air ventilation. Drinking water shall not be introduced into the tank until proper curing has occurred.

(b) It shall be the responsibility of the water system to assure that no tastes,odors, toxins, or contaminantsthat result in MCL exceedances, are imparted to the water as a result of tank coating or repair.

(c) Prior to placing a drinking water storage tank in service, cleaning, disinfection, and flushing procedures shall be completed.

(d) Prior to placing a drinking water storage tank in service, an analysis for volatile organic compounds from water contained therein may be required to verify compliance with drinking water maximum contaminants levels.

Guidance: If any volatile organic compounds are detectable, increased monitoring may be required in accordance with R309-205-6(2)(j)

R309-545-12. Steel Tanks.

(1) Paints.

Proper protection shall be given to all metal surfaces, both internal and external, by paints or other protective coatings. Internal coatings shall comply with R309-545-11.

(2) Cathodic Protection.

If installed, internal cathodic protection shall be designed, installed and maintained by personnel trained in corrosion engineering.

Guidance: Cathodic protection should be considered if an external structure, such as a communication tower, is added to the tank.

R309-545-13. Tank Overflow.

All water storage tanks shall be provided with an overflow that discharges at an elevation between 12 and 24 inches above the ground surface or the rim of the receiving basin. The discharge shall be directed away from the tank and shall not cause erosion.

(1) Diameter.

Overflow pipes shall be of sufficient capacity to permit waste of water in excess of the filling rate.

(2) Slope.

Overflow pipes shall be sloped for complete drainage.

(3) Screen.

Overflow pipes shall be screened with No. 4 mesh non-corrodible screen installed at a location least susceptible to damage by vandalism.

(4) Visible Discharge.

Overflow pipes shall be located so that any discharge is visible.

(5) Cross Connections.

Overflow pipes shall not be connected to, or discharge into, any sanitary sewer system.

R309-545-14. Access Openings.

Drinking water storage tanks shall be designed with reasonably convenient access to the interior for cleaning and maintenance.

Guidance: When considering what is reasonably convenient, it may be necessary for one individual to open the access. The access should be hinged at one side, and counter-weighted if the lid is in excess of 60 pounds. The safety of the operator* should *be considered when designing and locating access openings. Factors to be considered should include the placement of the locking mechanism, the location of the hinges for the hatch, etc.

(1) Height.

There shall be at least one opening above the level of the overflow, which shall be framed at least 4 inches above the surface of the roof at the opening; or if on a buried tank, shall be elevated at least 18 inches above any earthen cover over the tank. The frame shall be securely fastened and sealed to the tank roof to prevent any liquid contaminant entering the tank. Concrete drinking water storage tanks shall have raised curbs around access openings, formed and poured continuous with the pouring of the roof, and sloped to direct water away from the frame.

Guidance: It is preferable that access openings are framed higher than the 4 inches required above, and more if located in areas subject to heavy snow.

(2) Shoebox Lid.

The frame of any access opening shall be provided with a close-fitting, solid shoebox-type cover that extends down around the frame at least 2 inches and is furnished with a gasket(s) between the lid and frame. The horizontal surface of the tank lid shall not have any openings, cracks, or penetrations, such as a lock, key hole, or bolted handle that would allow contaminants to enter the tank.

Guidance: Those wishing to utilize pre-manufactured roof hatches as access lids for drinking water storage tanks should contact the distributor of such and make clear that any penetrations through the lid is not acceptable.

(3) Locking Device.

The lid to any access opening shall have a locking device.

R309-545-15. Venting.

Drinking water storage tanks shall be vented. The air venting capacity shall exceed the water inflow and the water outflow of the tank. Overflows shall not be considered or used as vents.

Vents provided on drinking water storage tanks shall:

(1) Inverted Vent.

Be downturned a minimum of 2 inches below any opening and shielded to prevent the entrance of contaminants.

(2) Open Venting.

On buried structures, the end of the vent discharge shall be a minimum of 24 inches above the earthen covering.

Guidance: In areas of heavy snowfall, it is recommended that the vent discharge be raised.

(3) Blockage.

Be located and sized to avoid blockage during winter conditions.

(4) Screen.

Be fitted with No. 14 mesh or finer non-corrodible screen.

(5) Screen Protector.

Vents that are 6-inch diameter or greater shall be fitted with additional heavy gage screen or substantial covering, which will protect the No. 14 mesh screen against vandalism or damage.

R309-545-16. Freezing Prevention.

All drinking water storage tanks and their appurtenances, especially the riser pipes, overflows, and vents, shall be designed to prevent freezing, which may interfere with proper functioning.

R309-545-17. Level Controls.

Adequate level control devices shall be provided to maintain water levels in storage tanks.

Guidance: Some tanks should have automatic flow control devices because of the size and complexity of the system, while other smaller systems may monitor the tank levels manually. Level controls should be adequate to assure that the distribution system and tank will not run out of water.

R309-545-18. Safety.

(1) Utah OSHA.

The safety of employees shall be considered in the design of the storage tank. Ladders, ladder guards, platform railings, and safely located entrance hatches shall be provided where applicable. As a minimum, safety practices shall conform to pertinent laws and regulations of the Utah Occupational Safety and Health Division.

(2) Ladders.

Ladders having an unbroken length in excess of 20 feet shall be provided with appropriate safety features, such as a safety cage, a safety harness, platforms, etc.

(3) Requirements for Elevated Tanks.

Elevated tanks shall have railings or handholds provided to access the water compartment safely.

R309-545-19. Disinfection.

Drinking water storage tanks shall be disinfected before being put into service for the first time and after being entered. The tank shall be cleaned of all refuse and shall then be washed with drinking water prior to adding the disinfectant. AWWA Standard C652-11 shall be followed for tank disinfection.

Upon completing any of the three methods for storage tank chlorination, as outlined in AWWA C652-11, the water system must properly dispose of residual super-chlorinated waters in the outlet pipes. Other super-chlorinated waters, which are not to be ultimately diluted and delivered into the distribution system, shall also be properly disposed. Chlorinated water discharged from the storage tank shall be disposed of in conformance with R317 of the Utah Administrative Code.

R309-545-20. Tank Standards*.*

The plans and specifications shall incorporate the applicable portions of the following standards:

(1) AWWA Standards.

(a) C652-11, Disinfection of Water- Storage Facilities.

(b) D100-11, Welded Carbon Steel Tanks for Water Storage.

(c) D102-11, Coating Steel Water-Storage Tanks.

(d) D103-09, Factory-Coated Bolted Carbon Steel Tanks for Water Storage.

(e) D104-11, Automatically Controlled, Impressed-Current Cathodic Protection for the Interior Submerged Surfaces of Steel Water Tanks.

(f) D110-13, Wire- and Strand-Wound, Circular, Prestressed Concrete Water

Tanks

(g) D115-06, Tendon-Prestressed Concrete Water Tanks.

(h) D120-09, Thermosetting Fiberglass-Reinforced Plastic Tanks.

(i) D130-11, Geomembrane Materials for Potable Water Applications.

(2) NSF International Standards.

(a) NSF 60, Drinking Water Treatment Chemicals - Health Effects.

(b) NSF 61, Drinking Water System Components - Health Effects.

(3) Utah OSHA.

Applicable standards of the Utah Occupational Safety and Health Division shall be adhered to.

R309-545-21. Operation and Maintenance of Storage Tanks.

(1) Inspection and Cleaning.

Tanks that are entered for inspection or cleaning shall be disinfected in accordance with AWWA Standard C652-11 prior to being returned to service.

(2) Recoating or Repairing.

Any substance used to recoat or repair the interior of a drinking water storage tank shall be certified to conform to ANSI/NSF Standard 61. If the tank is not drained for recoating or repairing, any substance or material used to repair the interior coatings or cracks shall be suitable for underwater application, as indicated by the manufacturer, as well as comply with both ANSI/NSF Standards 60 and 61. Recoating of the interior of a drinking water tank shall comply with the plan review requirements of R309-500-5(1)(c)(i).

(3) Seasonal Use.

Water storage tanks, which are operated seasonally, shall be flushed and disinfected in accordance with AWWA Standard C652-11 prior to each season's use. Certification of proper disinfection shall be obtained by the water system and kept on file. During the non-use period, care shall be taken to see that openings to the water storage tank (those which are normally closed and sealed during normal use) are closed and secured.

KEY: drinking water, storage tanks, access, overflow and drains
Date of Enactment or Last Substantive Amendment: November 10, 2014
Notice of Continuation: March 22, 2010
Authorizing, and Implemented or Interpreted Law: 19-4-104

R309. Environmental Quality, Drinking Water.
R309-545. Facility Design and Operation: Drinking Water Storage Tanks.
R309-545-1. Purpose.

The purpose of this rule is to provide specific requirements for public drinking water storage tanks. It is intended to be applied in conjunction with other rules, specifically R309-500 through R309-550. Collectively, these rules govern the design, construction, operation, and maintenance of public drinking water system facilities. These rules are intended to assure that facilities are reliably capable of supplying water in adequate quantities which consistently meeting applicable drinking water quality requirements and not posing a threat to general public health.

R309-545-2. Authority.

This rule is promulgated by the Drinking Water Board as authorized by Title 19, Environmental Quality Code, Chapter 4, Safe Drinking Water Act, Subsection 104(1)(a)(ii) of the Utah Code and in accordance with Title 63G, Chapter 3 of the same, known as the Administrative Rulemaking Act.

R309-545-3. Definitions.

Definitions for certain terms used in this rule are given in R309-110 but may be further clarified herein.

R309-545-4. General.

Storage for drinking water shall be provided as an integral part of each public drinking water system unless an exception to the rule is approved by the Director. Pipeline volume in transmission or distribution lines shall not be considered part of any storage volumes.

R309-545-5. Size of Tank(s).

Storage tanks shall be sized in accordance with the required minimums of R309-510.

R309-545-6. Tank Material and Structural Adequacy.

(1) Materials.

The materials used in drinking water storage tanks shall provide stability and durability as well as protect the quality of the stored water. Steel tanks shall be constructed from new, previously unused, plates and designed in accordance with AWWA Standard D100-11.

(2) Structural Design.

The structural design of drinking water storage tanks shall be sufficient for the environment in which they are located.

R309-545-7. Location of Tanks.

(1) Pressure Considerations.

The location of the tank and the design of the water system shall be such that the minimum working pressure in the distribution system shall meet the minimum pressures as required in R309-105-9.

(2) Connections.

Tanks shall be located at an elevation where present and anticipated connections can be adequately served. System connections shall be placed at elevations such that minimum pressures, as required

in R309-105-9, will be continuously maintained.

(3) Sewer Proximity.

Sewers, and similar sources of possible contamination shall be kept at least 50 horizontal feet from the tank.

(4) Standing Surface Water.

The area surrounding a ground-level or buried drinking water storage tank shall be graded in a manner that will prevent surface water from standing within 50 horizontal feet of the tank.

(5) Ability to Isolate.

Drinking water storage tanks shall be designed and located so that they can be isolated from the distribution system. Storage tanks shall be capable of being drained for cleaning or maintenance. Where possible, tanks shall be designed with the ability to be isolated without loss of pressure or service in the distribution system.

(6) Earthquake and Landslide Risks.

Potential geologic hazards shall be taken into account in selecting a tank location. Earthquake and landslide risks shall be evaluated.

(7) Security.

The site location and design of a drinking water storage tank shall take into consideration security issues and potential for vandalism.

R309-545-8. Tank Elevation and Burial.

(1) Flood Elevation.

The bottom of a ground-level or buried drinking water storage tank[~~s~~] shall be located at least 3 feet above the 100-year flood level or the highest known maximum flood elevation, whichever is higher.

(2) Ground Water.

When the bottom of a drinking water storage tank will be placed below the normal ground surface, it shall be placed above the local ground water table

(3) Covered Roof.

When the roof of a drinking water storage tank will be covered by earth, the roof shall be sloped to drain toward the outside edge of the tank.

R309-545-9. Tank Roof and Sidewalls.

(1) Protection From Contamination.

All drinking water storage tanks shall have suitable watertight roofs and sidewalls that shall also exclude birds, animals, insects, and excessive dust.

(2) Openings.

Openings in the roof and sidewalls shall be kept to a minimum and shall comply with the following:

(a) Any pipes running through the roof or sidewall of a metal drinking water storage tank shall be welded, or properly gasketed. In new concrete tanks, these pipes shall be connected to standard wall castings with seepage rings that have been poured in place. Vent pipes, in addition to seepage rings, shall have raised concrete curbs that direct water away from the vent pipe and are formed as a single pour with the roof deck. Roof drains or any other pipes, which may contain water of lesser quality than drinking water, shall

not penetrate the roof, walls, or floor of a drinking water storage tank.

(b) Openings in a storage tank roof or top, designated to accommodate control apparatus or pump columns, shall be welded, gasketed, or curbed and sleeved as above, and shall have additional proper shielding to prevent vandalism.

(3) Adjacent Compartments.

Drinking water shall not be stored or conveyed in a compartment adjacent to wastewater when the two compartments are separated by a single wall.

(4) Roof Drainage.

The roof of all storage tanks shall be designed for drainage to eliminate water ponding. Parapets, or similar structures, which would tend to hold water and snow, shall not be allowed/permitted unless adequate waterproofing and drainage are provided. Downspout or roof drain pipes shall not enter or pass through the tank.

R309-545-10. Internal Features.

The following shall apply to internal features of drinking water storage tanks:

(1) Drains.

(a) A means shall be provided for the draining of drinking water storage tanks.

(b) Where possible, the drain shall be separate from the outlet pipeline. If a tank drain line is provided, it shall be sloped for complete drainage.

(c) The drain shall not discharge to a sanitary sewer.

(d) If local authority allows discharge to a storm drain, the drain discharge shall have a physical clearance of at least 12 inches between the discharge end of the pipe and the overflow rim of the receiving basin.

(2) Internal Catwalks.

Internal catwalks, if provided and located over the drinking water, shall have a solid floor with raised edges. The edges and floor shall be designed so that shoe scrapings or dirt will not fall into the drinking water.

(3) Inlet and Outlet.

(a) To minimize potential sediment in the flow from the tank, the outlet pipes from all tanks shall be located in a manner to provide a silt trap prior to discharge into the distribution system.

(b)Inlet and outlet pipes shall be configured to provide mixing and circulation.

(4) Tank Floor.

The floor of the storage tank shall be sloped to permit complete drainage of the structure.

R309-545-11. Internal Surfaces and Coatings.

(1) ANSI/NSF Standard 61 Certification.

All interior surfaces and coatings shall comply with ANSI/NSF Standard 61 or other standards approved by the Director. This requirement applies to any pipes and fittings, protective materials (e.g., paints, coatings, concrete admixtures, concrete release agents, or concrete sealers), joining and sealing materials (e.g., adhesives, caulks, gaskets, primers and sealants) and mechanical

devices (e.g., electrical wire, switches, sensors, valves, or submersible pumps) that may come into contact with the drinking water.

(2) Curing Procedures and Volatile Organic Compounds.

(a) Proper curing procedures shall be followed per manufacturer's directions, including curing time, temperature, and forced air ventilation. Drinking water shall not be introduced into the tank until proper curing has occurred.

(b) It shall be the responsibility of the water system to assure that no tastes, odors, toxins, or contaminants that result in MCL exceedances, are imparted to the water as a result of tank coating or repair.

(c)Prior to placing a drinking water storage tank in service, cleaning, disinfection, and flushing procedures shall be completed.

(d) Prior to placing a drinking water storage tank in service, an analysis for volatile organic compounds from water contained therein may be required to verify compliance with drinking water maximum contaminant levels.

R309-545-12. Steel Tanks.

(1) Paints.

Proper protection shall be given to all metal surfaces, both internal and external, by paints or other protective coatings. Internal coatings shall comply with R309-545-11.

(2) Cathodic Protection.

If installed, internal cathodic protection shall be designed, installed and maintained by personnel trained in corrosion engineering.

R309-545-13. Tank Overflow.

All water storage tanks shall be provided with an overflow that discharges at an elevation between 12 and 24 inches above the ground surface or the rim of the receiving basin. The discharge shall be directed away from the tank and shall not cause erosion.

(1) Diameter.

Overflow pipes shall be of sufficient capacity to permit waste of water in excess of the filling rate.

(2) Slope.

Overflow pipes shall be sloped for complete drainage.

(3) Screen.

Overflow pipes shall be screened with No. 4 mesh non-corrodible screen installed at a location least susceptible to damage by vandalism.

(4) Visible Discharge.

Overflow pipes shall be located so that any discharge is visible.

(5) Cross Connections.

Overflow pipes shall not be connected to, or discharge into, any sanitary sewer system.

R309-545-14. Access Openings.

Drinking water storage tanks shall be designed with reasonably convenient access to the interior for cleaning and maintenance.

(1) Height.

There shall be at least one opening above the level of the

overflow, which shall be framed at least 4 inches above the surface of the roof at the opening; or if on a buried tank, shall be elevated at least 18 inches above any earthen cover over the tank. The frame shall be securely fastened and sealed to the tank roof to prevent any liquid contaminant entering the tank. Concrete drinking water storage tanks shall have raised curbs around access openings, formed and poured continuous with the pouring of the roof, and sloped to direct water away from the frame.

(2) Shoebox Lid.

The frame of any access opening shall be provided with a close-fitting, solid shoebox type cover that extends down around the frame at least 2 inches and is furnished with a gasket(s) between the lid and frame. The horizontal surface of the tank lid shall not have any openings, cracks, or penetrations, such as a lock, key hole, or bolted handle that would allow contaminants to enter the tank.

(3) Locking Device.

The lid to any access opening shall have a locking device.

R309-545-15. Venting.

Drinking water storage tanks shall be vented. The air venting capacity shall exceed the water inflow and the water outflow of the tank. Overflows shall not be considered or used as vents. Vents provided on drinking water storage tanks shall:

(1) Inverted Vent.

Be downturned a minimum of 2 inches below any opening and shielded to prevent the entrance of contaminants.

(2) Open Venting.

On buried structures, the end of the vent discharge shall be a minimum of 24 inches above the earthen covering.

(3) Blockage.

Be located and sized to avoid blockage during winter conditions.

(4) Screen.

Be fitted with No. 14 mesh or finer non-corrodible screen.

(5) Screen Protector.

Vents that are 6-inch diameter or greater shall be fitted with additional heavy gage screen or substantial covering, which will protect the No. 14 mesh screen against vandalism or damage.

R309-545-16. Freezing Prevention.

All drinking water storage tanks and their appurtenances, especially the riser pipes, overflows, and vents, shall be designed to prevent freezing which may interfere with proper functioning.

R309-545-17. Level Controls.

Adequate level control devices shall be provided to maintain water levels in storage tanks.

R309-545-18. Safety.

(1) Utah OSHA.

The safety of employees shall be considered in the design of the storage tanks. Ladders, ladder guards, platform railings, and safely located entrance hatches shall be provided where applicable. As a minimum, safety practices shall conform to pertinent laws and regulations of the Utah Occupational Safety and Health Division.

(2) Ladders.

Ladders having an unbroken length in excess of 20 feet shall be provided with appropriate safety features, such as a safety cage, a safety harness, platforms, etc.

(3) Requirements for Elevated Tanks.

Elevated tanks shall have railings or handholds provided to access the water compartment safely.

R309-545-19. Disinfection.

Drinking water storage tanks shall be disinfected before being put into service for the first time and after being entered. The tank shall be cleaned of all refuse and shall then be washed with drinking water prior to adding the disinfectant. AWWA Standard C652-11 shall be followed for tank disinfection.

Upon completing any of the three methods for storage tank chlorination, as outlined in AWWA C652-11, the water system must properly dispose of residual super-chlorinated waters in the outlet pipes. Other super-chlorinated waters, which are not to be ultimately diluted and delivered into the distribution system, shall also be properly disposed. Chlorinated water discharged from the storage tank shall be disposed of in conformance with R317 of the Utah Administrative Code.

R309-545-20. Tank Standards.

The plans and specifications shall incorporate the applicable portions of the following standards:

(1) AWWA Standards.

(a) C652-11, Disinfection of Water-Storage Facilities.

(b) D100-11, Welded Carbon Steel Tanks for Water Storage.

(c) D102-11, Coating Steel Water-Storage Tanks.

(d) D103-09, Factory-Coated Bolted Carbon Steel Tanks for Water Storage.

(e) D104-11, Automatically Controlled, Impressed-Current Cathodic Protection for the Interior Submerged Surfaces of Steel Water Tanks.

(f) D110-13, Wire- and Strand-Wound, Circular, Prestressed Concrete Water Tanks.

(g) D115-06, Tendon-Prestressed Concrete Water Tanks.

(h) D120-09, Thermosetting Fiberglass-Reinforced Plastic Tanks.

(i) D130-11, Geomembrane Materials for Potable Water Applications.

(2) NSF International Standards.

(a) NSF 60, Drinking Water Treatment Chemicals - Health Effects.

(b) NSF 61, Drinking Water System Components - Health Effects.

(3) Utah OSHA.

Applicable standards of the Utah Occupational Safety and Health Division shall be adhered to.

R309-545-21. Operation and Maintenance of Storage Tanks.

(1) Inspection and Cleaning.

Tanks that are entered for inspection or cleaning shall be disinfected in accordance with AWWA Standard C652-11 prior to being returned to service.

(2) Recoating or Repairing.

Any substance used to recoat or repair the interior of a drinking water storage tank shall be certified to conform to ANSI/NSF Standard 61. If the tank is not drained for recoating or repairing, any substance or material used to repair the interior coatings or cracks shall be suitable for underwater application, as indicated by the manufacturer, as well as comply with both ANSI/NSF Standards 60 and 61. Recoating of the interior of a drinking water tank shall comply with the plan review requirements of R309-500-5(1)(c)(i).

(3) Seasonal Use.

Water storage tanks which are operated seasonally shall be flushed and disinfected in accordance with AWWA Standard C652-11 prior to each season's use. Certification of proper disinfection shall be obtained by the water system and kept on file. During the non-use period, care shall be taken to see that openings to the water storage tank (those which are normally closed and sealed during normal use) are closed and secured.

KEY: drinking water, storage tanks, access, overflow and drains
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Authorizing, and Implemented or Interpreted Law: 19-4-104

Agenda Item 7(C)

RULE ADOPTION FOR
CHANGE IN PROPOSED RULE *R309-550*

On May 9, 2014, the Drinking Water Board authorized the Division staff to initiate the rule-making process for revising R309-550. R309-550 governs the design and construction requirements related to transmission and distribution pipelines.

The original proposed modifications to *R309-550* include the following:

- Add the requirement for pressure reducing valve (PRV) stations on new water distribution lines when the water pressure exceeds 150 psi.
- Add the requirement for special design on community systems in areas of geologic hazard.
- Revise to include the new Federal requirement for "lead-free" materials.
- Clarify the chamber drainage requirements.
- Add a new section on Control Valve Stations including PRVs, backflow devices, and meters.
- Revise the minimum separation standards and add specific requirements for allowing sewer and water lines to be closer together under certain circumstances.
- Clarify the pipe design criteria for Surface Water Crossings.
- Add a guidance paragraph to clarify that fire sprinkler booster pumps are not considered individual home booster pumps that would be used regularly.

The public comment period for the original rule revision was from June 1, 2014, to July 1, 2014. Several comments were received during this period. The Board authorized staff to proceed with the "Change in Proposed Rule" on July 18, 2014. The comment period for the "Change in Proposed Rule" was from August 15 to September 15, 2014The proposed modifications for the Change in the Proposed Rule to *R309-550* include the following:

- Add a requirement to submit information on the condition of the pipe when sewer and water lines are closer than 10 feet.

No comments were received to the Change in the Proposed Rule.

Two versions of the R309-550 revision are enclosed:

- The Division of Administrative Rules (DAR) maintains the official version of the rules and oversees the rulemaking process. The DAR format does not contain any indentation.

- The Division of Drinking Water (DDW) has chosen to provide a DDW version of the rule to the public. The rule content of the DDW version is the same as the DAR version. The DDW version is formatted for easier reading (with indentation) and contains DDW's interpretations of the rule (in the form of guidance paragraphs). These guidance paragraphs are not considered part of the official rule.

Staff Recommendation: The staff recommends that Board adopt the Change in Proposed Rule to

R309-550 and authorize staff to make this rule change effective on November 10, 2014.

R309-550 Facility Design and Operation: Transmission and Distribution Pipelines

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R309-550. Facility Design and Operation: Transmission and Distribution Pipelines.

R309-550-1. Purpose.

The purpose of this rule is to provide specific requirements for the design and installation of transmission and distribution pipelines which deliver drinking water to facilities of public drinking water systems or to consumers. It is intended to be applied in conjunction with rules R309-500 through R309-550. Collectively, these rules govern the design, construction, operation, and maintenance of public drinking water system facilities. These rules are intended to assure that facilities are reliably capable of supplying water in adequate quantities, consistently meeting applicable drinking water quality requirements, and not posing a threat to general public health.

R309-550-2. Authority.

This rule is promulgated by the Drinking Water Board as authorized by Title 19, Environmental Quality Code, Chapter 4, Safe Drinking Water Act, Subsection 104(1)(a)(ii) of the Utah Code and in accordance with Title 63G, Chapter 3 of the same, known as the Administrative Rulemaking Act.

R309-550-3. Definitions.

Definitions for certain terms used in this rule are given in R309-110 but may be further clarified herein.

R309-550-4. General.

Transmission and distribution pipelines shall be designed, constructed and operated to convey adequate quantities of water at ample pressure, while maintaining water quality.

R309-550-5. Water Main Design.

(1) Distribution System Pressure.

(a) The distribution system shall be designed to maintain minimum pressures as required in R309-105-9 at points of connection, under all conditions of flow.

(b) When static pressure exceeds 150 psi in new distribution water lines, pressure reducing devices shall be provided on mains in the distribution system where service connections exist.

Guidance: The normal working pressure in the distribution system should be between 60 and 100 psi. The requirement for PRV's to be installed when pressures exceed 150

psi only applies to new water pipelines. Systems should implement an operation program to protect water users from excessive pressures.

(2) Design Flow Rates.

Flow rates used when designing or analyzing distribution systems shall meet the minimum requirements in R309-510.

(3) Hydraulic Analysis.

(a) All water mains shall be sized following a hydraulic analysis based on flow demands and pressure requirements.

(b) Where improvements will upgrade more than 50% of an existing distribution system, or where a new distribution system is proposed, a hydraulic analysis of the entire system shall be prepared and submitted for review prior to plan approval.

(c) Some projects require a hydraulic model. The Division may require submission of a hydraulic modeling report and/ or certification, as outlined in R309-511, prior to plan approval.

(4) Minimum Water Main Size.

For water mains not connected to fire hydrants, the minimum line size shall be 4 inches in diameter, unless they serve picnic sites, parks, semi-developed camps, primitive camps or roadway rest-stops. Minimum water main size, serving a fire hydrant lateral, shall be 8 inches in diameter unless a hydraulic analysis indicates that required flow and pressures can be maintained by 6-inch lines.

Guidance: Generally, velocity in a water main should not exceed 5 fps. Mains should be designed with sufficient excess capacity to provide for anticipated future connections.

(5) Fire Protection.

When a public water system is required to provide water for fire flow by the local fire code official, or if the system has installed fire hydrants on existing distribution mains for that purpose:

(a) The design of the distribution system shall be consistent with the fire flow requirements as determined by the local fire code official.

Guidance: The State Fire Marshall's office has stated that "The State- adopted fire code recognizes that water mains intended for firefighting need not become subject to retroactive fire flow requirements. As such, an existing system is

considered code compliant as long as it is maintained properly and new construction does not alter the fire flow requirement. Water companies are encouraged to make improvements incrementally to avoid a possible moratorium on development due to lack of water, i.e., fire flow."

(b) The location of fire hydrants shall be consistent with the requirements of the State-adopted fire code and as determined by the local fire code official.

Guidance: Generally, individual hydrant spacing may range from 200 to 500 feet depending on the area being served. The planning of hydrant locations should be a cooperative effort between the water utility and local fire officials.

(c) The pipe network design shall permit fire flows to be met at representative locations while minimum pressures, as required in R309-105-9, are maintained at all times and at all points in the distribution system.

(d) Fire hydrant laterals shall be a minimum of 6 inches in diameter.

(6) Geologic Considerations.

The character of the soil through which water mains are to be laid shall be considered. Special design and burial techniques shall be employed for Community Water Systems in areas of geologic hazard (e.g., slide zones, fault zones, river crossings, etc.)

Guidance: Water supply conduits and major service lines crossing known fault areas should be either designed to accommodate significant differential movement of the ground, or be valved immediately above and below the points of the fault crossing to allow control of water flow, in case of pipe rupture during an earthquake event.

Guidance: Water systems should be designed to provide alternative flow paths for major conduits in regions of known geologic hazards.

(7) Dead Ends.

(a) To provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins whenever practical.

(b) Where dead-end mains occur, they shall be provided with a fire hydrant if flow and pressure are sufficient, or with an approved flushing hydrant or blow-off for flushing purposes. Flushing devices shall be sized to provide flows that will give a velocity of at least 2.5 fps in the water main being flushed. No flushing device shall be directly connected to a sewer.

(8) Isolation Valves.

Sufficient number of valves shall be provided on water mains so that inconvenience and

sanitary hazards will be minimized during repairs. Valves shall be located at not more than 500foot intervals in commercial districts and at not more than one block or 800 foot intervals in other districts. Where systems serve widely scattered customers and where future development is not expected, the valve spacing shall not exceed one mile.

(9) Corrosive Soils and Waters.

Consideration shall be given to the materials to be used when corrosive soils or waters will be encountered.

(10) Special Precautions in Areas of Contamination

Where distribution systems are installed in areas of contamination:

(a) pipe and joint materials which are not susceptible to contamination, such as permeation by organic compounds, shall be used; and,

(b) non-permeable materials shall be used for all portions of the system including water mains, service connections, and hydrant leads.

(11) Water Mains and Other Sources of Contamination.

Caution shall be exercised when locating water mains at or near certain sites such as sewage treatment plants or industrial complexes. Individual septic tanks shall be located and avoided. The Division shall be contacted to establish specific design requirements prior to locating water mains near a source of contamination.

Guidance: It is recommended that utility lines are clearly identified and visually different from one another. Consideration shall be given to providing appropriate separation between water and other utilities for operational and contamination reasons.

R309-550-6. Component Materials and Design.

(1) ANSI/NSF Standard for Health Effects.

All materials that may come in contact with drinking water, including pipes, gaskets, lubricants and O-Rings, shall be ANSI-certified as meeting the requirements of ANSI/NSF Standard 61, Drinking Water System Components - Health Effects. To permit field-verification of this certification, all components shall be appropriately stamped with the NSF logo.

(2) Asbestos and Lead.

(a) The use of asbestos cement pipe shall not be allowed.

(b) Pipes and pipe fittings installed after January 4, 2014, shall be “lead free” in

accordance with Section 1417 of the Federal Safe Drinking Water Act. They shall be certified as meeting ANSI/NSF 372 or Annex G of ANSI/NSF 61.

Guidance: The Community Fire Safety Act of 2013 exemplts fire hydrants from the lead free requirements of Section 1417.

(3) Standards for Mechanical Properties.

Pipe, joints, fittings, valves, and fire hydrants shall conform to ANSI/NSF Standard 61, and applicable sections of AWWA Standards C104-A21.4-08 through C550-05 and C900-07 through C950-07.

(4) Used Materials.

Only materials that have been used previously for conveying drinking water may be reused. Used materials shall meet the above standards, be thoroughly cleaned, and be restored to their original condition.

(5) Fire Hydrants .

(a) Hydrant drains shall not be connected to, or located within, 10 feet of sanitary sewers. Where possible, hydrant drains shall not be located within 10 feet of storm drains.

(b) Auxiliary valves shall be installed in all hydrant leads.

(c) Hydrant drains shall be installed with a gravel packet or dry well unless the natural soils will provide adequate drainage.

(6) Air Relief Valves and Blow-offs.

(a) At high points in water mains where air can accumulate, provisions shall be made to remove air by means of hydrants or air relief valves.

(b) The open end of the air relief vent pipe from automatic valves shall be provided with a #14 mesh, non-corrodible screen and a downward elbow, and where possible, be extended to at least one foot above grade. Alternatively, the open end of the pipe may be extended to as little as one foot above the top of the pipe if the valve's chamber is not subject to flooding, or if it meets the requirements of (7) Chamber Drainage.

(c) Blow-offs or air relief valves shall not be connected directly to a sewer.

(d) Adequate number of hydrants or blow-offs shall be provided to allow periodic flushing and cleaning of water lines.

(e) The air relief valve shall be installed in a manner to prevent it from freezing. A

shut-off valve shall be provided to permit servicing of an air relief valve.

(7) Chamber Drainage

(a) Chambers, pits, or manholes containing valves, blow-offs, meters, or other such appurtenances to a distribution system, shall not be connected directly to a storm drain or sanitary sewer.

(b) Chambers shall be provided with a drain to daylight, if possible. Where this is not possible, underground gravel-filled absorption pits may be used if the site is not subject to flooding and conditions will assure adequate drainage. Sump pumps may also be considered if a drain to daylight or absorption pit is not feasible.

(8) Control Valve Stations

(a) Pressure Reducing Valves (PRV's)

(i) Isolation Valves shall be installed on both sides of the pressure reducing valve.
(ii) Where variable flow conditions will be encountered, consideration shall be given to providing parallel PRV lines to accommodate low and high flow conditions.

(b) Backflow Devices
Installation of Backflow devices shall conform to the State-adopted plumbing code.

(c) Meters
Meter installation shall conform to the State-adopted plumbing code and local jurisdictional standards.

R309-550-7. Separation of Water Mains and Transmission Lines from Sewers.

(1) Basic Separation Standards.

(a) The horizontal distance between water lines and sanitary sewer lines shall be at least10 feet. Where a water main and a sewer line must cross, the water main shall be at least 18 inches above the sewer line. Separation distances shall be measured edge-to-edge (i.e., from the nearest edges of the facilities).

(b) Water mains and sewer lines shall not be installed in the same trench.

(c) Where local conditions make it impossible to install water or sewer lines at

separation distances required by subsection (a), the sewer pipes are in good condition, and there is not high groundwater in the area, it may be acceptable if the design includes a minimum horizontal separation of 6 feet and a minimum vertical clearance of 18 inches with the waterline being above. In order to determine whether the design is acceptable, the following information shall be submitted as part of the plans for review:

(i) reason for not meeting the minimum separation standard;
(ii) location where the water and sewer line separation is not being met;
(iii) horizontal and vertical clearance that will be achieved;
(iv) sewer line information including pipe material, condition, size, age, type of joints, thickness or pressure class, whether the pipe is pressurized or not, etc.;
(v) water line information including pipe material, condition, size, age, type of joints, thickness or pressure class, etc.;
(vi) ground water and soil conditions; and,
(vii) any mitigation efforts.

(d) If the basic separation standards as outlined in subsections (a) though (c) above cannot be met, an exception to the rule can be applied for with additional mitigation measures to protect public health, in accordance with R309-105-6(2)(b).

Guidance: Consideration should be given to placing warning tape above the water lines and/ or sewer lines

(3) Special Provisions.

The following special provisions apply to all situations:

(a) The basic separation standards are applicable under normal conditions for sewage collection lines and water distribution mains. More stringent requirements may be necessary if conditions such as high groundwater exist.

(b) All water transmission lines that may become unpressurized shall not be installed within 20 feet of sewer lines.

(c) In the installation of water mains or sewer lines, measures shall be taken to prevent or minimize disturbances of the existing line.

(d) Special consideration shall be given to the selection of pipe materials if corrosive conditions are likely to exist or where the minimum separation distances cannot be met. These conditions may be due to soil type, groundwater, and/or the nature of the fluid conveyed in the conduit, such as a septic sewage which produces corrosive hydrogen sulfide

(e) Sewer Force Mains

(i) When a new sewer force main crosses under an existing water main, all portions of the sewer force main within 10 feet (horizontally) of the water main shall be enclosed in a continuous sleeve.

(ii) When a new water main crosses over an existing sewer force main, the water main shall be constructed of pipe materials with a minimum rated working pressure of 200 psi or equivalent pressure rating.

(4) Water Service Laterals Crossing Sewer Mains and Laterals.

Water service laterals shall conform to all requirements given herein for the separation of water and sewer lines.

R309-550-8. Installation of Water Mains.

(1) Standards.

The specifications shall incorporate the provisions of the manufacturer's recommended installation procedures or the following applicable standards:

(a) For ductile iron pipe, AWWA Standard C600-10, Installation of Ductile Iron Water Mains and Their Appurtenances;

(b) For PVC pipe, ASTM D2774, Recommended Practice for Underground Installation of Thermoplastic Pressure Piping and PVC Pipe and AWWA Manual of Practice M23, 2003;

(c) For HDPE pipe, ASTM D2774, Recommended Practice for Underground Installation of Thermoplastic Pressure Piping and AWWA Manual of Practice M55, 2006; and

(d) For Steel pipe, AWWA Standard C604-11, Installation of Buried Steel Water Pipe- 4 inch and Larger

Guidance: Consideration should be given to placing tracer wire on plastic pipe to permit location of the pipe by available detection equipment.

(2) Bedding.

A continuous and uniform bedding shall be provided in the trench for all buried pipe. Stones larger than the backfill materials described below shall be removed for a depth of at least 6 inches below the bottom of the pipe.

(3) Backfill.

Backfill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe. The material and backfill zones shall be as specified by the standards referenced in Subsection (1), above. As a minimum:

(a) for plastic pipe, backfill material with a maximum particle size of 3/4 inch shall be used to surround the pipe; and

(b) for ductile iron pipe, backfill material shall contain no stones larger than 2 inches.

(4) Dropping Pipe into Trench.

Under no circumstances shall the pipe or accessories be dropped into the trench.

(5) Burial Cover.

All water mains shall be covered with sufficient earth or other insulation to prevent freezing, unless they are part of a non-community system that can be shut-down and drained during winter months when temperatures are below freezing.

Guidance: Pipe should be buried at least 12 inches below maximum expected frost penetration. The following is a list of reported pipe burial depths in Utah that may serve as a guide in this respect:

(A) Logan - 5ft.
(B) Salt Lake City - 3.5 ft. (5 ft. in high benches)
(C) Alta/Snowbird - 6 ft. (7 ft. if under roadway)
(D) St. George - 3ft.
(E) Park City - 5ft. (7 ft. above 7000 ft. elevation)
(F) Richfield - 4 ft.
(G) Moab - 4 ft.

(6) Thrust Blocking.

All tees, bends, plugs, and hydrants shall be provided with thrust blocking, anchoring, tie rods, or restraint joints designed to prevent movement. Restraints shall be sized to withstand the forces experienced.

(7) Pressure and Leakage Testing.

All types of installed pipe shall be pressure tested and leakage tested in accordance with AWWA Standard C600-10.

(8) Surface Water Crossings.

Guidance: Surface water crossings, whether over or under water, present special problems. The Division should be consulted before final plans are prepared.

(a) Above Water Crossings

The pipe shall be adequately supported and anchored, protected from damage and freezing, and accessible for repair or replacement.

(b) Underwater Crossings

(i) A minimum cover of 2 feet or greater, as local conditions may dictate, shall be provided over the pipe.

(ii) When crossing water courses that are greater than 15 feet in width, the following shall be provided:

(A) Pipe with joints shall be of special construction, having restrained joints for joints within the surface water course and flexible restrained joints at both edges of the water course.

(B) Isolation valves shall be provided on both sides of the water crossing at locations not subject to high ground water or flooding, so that the section can be isolated for testing or repair.

(C) A means shall be provided, such as a sampling tap, not subject to flooding, to allow for representative water quality testing on the upstream and downstream sides of the crossing.

(D) A means shall be provided to pressure test the underground water crossing pipe.

(9) Sealing Pipe Ends During Construction.

The open ends of all pipelines under construction shall be covered and effectively sealed at the end of the day's work.

(10) Disinfecting Water Lines.

All new water mains or appurtenances shall be disinfected in accordance with AWWA Standard C651-05 or a method approved by the Director. The specifications shall include detailed procedures for the adequate flushing, disinfection, and microbiological testing of all water mains. On all new and extensive distribution system construction, evidence of satisfactory disinfection shall be provided to the Division. Samples for coliform analyses shall be collected after disinfection is complete and the system is refilled with drinking water. A standard heterotrophic plate count is advisable. The use of water for public

drinking water purposes shall not commence until the bacteriologic tests indicate the water is free from contamination.

R309-550-9. Cross Connections and Interconnections.

(1) Physical Cross Connections.

There shall be no physical cross connections between the distribution system and pipe, pumps, hydrants, or tanks that may be contaminated from any source, including pressurized irrigation.

(2) Recycled Water.

Neither steam condensate nor cooling water from engine jackets or other heat exchange devices shall be returned to the drinking water supply.

(3) System Interconnects.

The interconnections between different drinking water systems shall be reviewed and approved by the Director.

Guidance: In some situations, hydraulic modeling or capacity development calculations may be required when proposing a system interconnect.

R309-550-10. Water Hauling.

(1) Community Water Systems.

Water hauling is not an acceptable permanent source for drinking water distribution in Community Water Systems.

(2) Non-community Systems.

The Director may allow water hauling for Non-Community Public Water Systems by special approval if:

(a) consumers can not otherwise be supplied with good quality drinking water; or,

(b) the nature of the development, or ground conditions, are such that the placement of a pipe distribution system is not justified.

Proposals for water hauling shall be submitted to, and approved by, the Director.

(3) Emergencies.

Water hauling may be a temporary means of providing drinking water in an emergency. Water systems shall notify the Division as soon as possible of such emergencies.

Guidance: The guidelines for water hauling are contained in the bulletin entitled "Recommended Procedures for Hauling Culinary Water" available from the Division.

R309-550-11. Service Connections and Plumbing.

(1) Service Taps.

Service taps shall not jeopardize the quality of the system's water.

(2) Plumbing.

(a) Water services and plumbing shall conform to the State-adopted Plumbing Code.

(b) Pipes and pipe fittings installed after January 4, 2014, shall be "lead-free" in accordance with Section 1417 of the federal Safe Drinking Water Act. They shall be certified meeting the ANSI/NSF 372 or Annex G of ANSI/NSF 61.

(3) Individual Home Booster Pumps.

Individual booster pumps shall not be allowed for individual service from the public water supply mains. Exceptions to the rule may be granted by the Director if it can be shown that the granting of such an exception will not jeopardize the public health.

Guidance: Public water systems are being required to develop and operate a program to protect their systems from contaminations. An individual home booster pump, if installed so that the suction side of the pump draws directly from the system's water main rather than through an intermediate holding tank, may reduce the pressure in the main to less than 20 psi (perhaps even creating a vacuum). This will increase the potential for contaminated water to enter the distribution system through minor undetected leaks that may exist.

We cannot regulate the individual homeowner, but we do not want to encourage public water systems to proliferate the use of such pumps. Rule R309-105-6(2)(b) ("exceptions") will still be available for individual cases where there is no other acceptable alternative. Each public water system shall review language included in their service agreements with customers and perhaps modify them as needed to make it clear to the homeowner and plumbing inspector that such pumps are not allowed, without the permission of the public water system and authorized by the Director.

Fire sprinkler systems are increasingly required by local fire protection agencies for new buildings, including residential units. As the number of these systems increases, there will likely be instances where the water main pressure is inadequate to operate fire sprinklers at the desired flow rate. The fire sprinkler industry has developed booster pumps integral with the sprinkler piping to meet low pressure circumstances. These integral booster pumps will only operate during fire emergencies and will not affect normal distribution system pressures. During a fire emergency, the pump should not decrease line pressure any more than a fire hydrant. Accordingly, the Division considers these fire sprinkler booster pumps outside the intent of R309-550-11(3), and does not require their installation to be approved by the Division Director, if their installation conforms to the Utah adopted Plumbing Code and National Fire Protection Association (NFPA) 13 D, Standard for the Installation of Sprinkler Systems in one and two-family dwellings and manufactured homes.

(4) Service Lines.

(a) Service lines shall be capped until connected for service.

(b) The portion of the service line under the control of the water system is considered to be part of the distribution system.

(5) Service Meters and Building Service Line.

Connections between the service meter and the home shall be in accordance with the State -adopted Plumbing Code.

R309-550-12. Transmission Lines.

(1) Unpressurized Flows.

Transmission lines shall conform to all applicable requirements in this rule. Transmission line design shall minimize unpressurized flows.

(2) Proximity to Concentrated Sources of Pollution.

A water system shall not install an unpressurized transmission line less than 20 feet from a concentrated source of pollution (e.g., septic tanks and drain fields, garbage dumps, pit privies, sewer lines, feed lots, etc.). Furthermore, unpressurized transmission lines shall not be placed in boggy areas or areas subject to the ponding of water.

R309-550-13. Operation and Maintenance.

(1) Disinfection After Line Repair.

The disinfection procedures of Section 4.7, AWWA Standard C651-05 shall be followed if a water main is cut or repaired.

(2) Cross Connections.

The water system shall not allow a connection that may jeopardize water quality. Cross connections shall be eliminated by physical separation, an air gap, or an approved and properly operating backflow prevention assembly

The water system shall have an ongoing cross connection control program in compliance with R309-105-12.

(3) ANSI/NSF Standards.

All pipe and fittings used in routine operation and maintenance shall be ANSI-certified as meeting NSF Standard 61 or Standard 14.

(4) Seasonal Operation.

Water systems operated seasonally shall be disinfected and flushed according to AWWA Standard C651-05 for pipelines and AWWA Standard C652-11 for storage facilities prior to each season's use. A satisfactory bacteriologic sample shall be obtained prior to use. During the non-use period, care shall be taken to close all openings into the system.

Guidance:
Water systems are encouraged to develop contingency plans for obtaining pipe and appurtenances in an emergency. The stockpiling of material shall be considered.

KEY: drinking water, transmission and distribution pipelines, connections, water hauling
Date of Enactment or Last Substantive Amendment: November 10, 2014
Notice of Continuation: March 22, 2010
Authorizing, and Implemented or Interpreted Law: 19-4-104

R309. Environmental Quality, Drinking Water.
R309-550. Facility Design and Operation: Transmission and Distribution Pipelines.
R309-550-1. Purpose.

The purpose of this rule is to provide specific requirements for the design and installation of transmission and distribution pipelines which deliver drinking water to facilities of public drinking water systems or to consumers. It is intended to be applied in conjunction with rules R309-500 through R309-550. Collectively, these rules govern the design, construction, operation, and maintenance of public drinking water system facilities. These rules are intended to assure that facilities are reliably capable of supplying water in adequate quantities, consistently meeting applicable drinking water quality requirements, and not posing a threat to general public health.

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This rule is promulgated by the Drinking Water Board as authorized by Title 19, Environmental Quality Code, Chapter 4, Safe Drinking Water Act, Subsection 104(1)(a)(ii) of the Utah Code and in accordance with Title 63G, Chapter 3 of the same, known as the Administrative Rulemaking Act.

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(a)The distribution system shall be designed to maintain minimum pressures as required in R309-105-9 at points of connection, under all conditions of flow.

(b) When static pressure exceeds 150 psi in new distribution water lines, pressure reducing devices shall be provided on mains in the distribution system where service connections exist.

(2) Design Flow Rates.

Flow rates used when designing or analyzing distribution systems shall meet the minimum requirements in R309-510.

(3) Hydraulic Analysis.

(a) All water mains shall be sized following a hydraulic analysis based on flow demands and pressure requirements.

(b) Where improvements will upgrade more than 50% of an existing distribution system, or where a new distribution system is proposed, a hydraulic analysis of the entire system shall be prepared and submitted for review prior to plan approval.

(c) Some projects require a hydraulic model. The Division may require submission of a hydraulic modeling report and/or certification, as outlined in R309-511, prior to plan approval.

(4) Minimum Water Main Size.

For water mains not connected to fire hydrants, the minimum line size shall be 4 inches in diameter, unless they serve picnic sites, parks, semi-developed camps, primitive camps, or roadway rest-stops. Minimum water main size, serving a fire hydrant lateral, shall be 8 inches in diameter unless a hydraulic analysis indicates that required flow and pressures can be maintained by 6-inch lines.

(5) Fire Protection.

When a public water system is required to provide water for fire flow by the local fire code official, or if the system has installed fire hydrants on existing distribution mains for that purpose:

(a) The design of the distribution system shall be consistent with the fire flow requirements as determined by the local fire code official.

(b) The location of fire hydrants shall be consistent with the requirements of the State-adopted fire code and as determined by the local fire code official.

(c)The pipe network design shall permit fire flows to be met at representative locations while minimum pressures, as required in R309-105-9, are maintained at all times and at all points in the distribution system.

(d) Fire hydrant laterals shall be a minimum of 6 inches in diameter.

(6) Geologic Considerations.

The character of the soil through which water mains are to be laid shall be considered. Special design and burial techniques shall be employed for Community Water Systems in areas of geologic hazard (e.g., slide zones, fault zones, river crossings, etc.)

(7) Dead Ends.

(a) To provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins whenever practical.

(b) Where dead-end mains occur, they shall be provided with a fire hydrant if flow and pressure are sufficient, or with an approved flushing hydrant or blow-off for flushing purposes. Flushing devices shall be sized to provide flows that will give a velocity of at least 2.5 fps in the water main being flushed. No flushing device shall be directly connected to a sewer.

(8) Isolation Valves.

Sufficient number of valves shall be provided on water mains so that inconvenience and sanitary hazards will be minimized during repairs. Valves shall be located at not more than 500 foot intervals in commercial districts and at not more than one block or 800 foot intervals in other districts. Where systems serve widely scattered customers and where future development is not expected, the valve spacing shall not exceed one mile.

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Consideration shall be given to the materials to be used when corrosive soils or waters will be encountered.

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Where distribution systems are installed in areas of contamination:

(a) pipe and joint materials which are not susceptible to contamination, such as permeation by organic compounds, shall be used; and,

(b) non-permeable materials shall be used for all portions of the system including water mains, service connections, and hydrant leads.

(11) Water Mains and Other Sources of Contamination.

Caution shall be exercised when locating water mains at or near certain sites such as sewage treatment plants or industrial complexes. Individual septic tanks shall be located and avoided. The Division shall be contacted to establish specific design requirements prior to locating water mains near a source of contamination.

R309-550-6. Component Materials and Design.

(1) ANSI/NSF Standard for Health Effects.

All materials that may come in contact with drinking water, including pipes, gaskets, lubricants and O-Rings, shall be ANSI-certified as meeting the requirements of ANSI/NSF Standard 61, Drinking Water System Components - Health Effects. To permit field-verification of this certification, all components shall be appropriately stamped with the NSF logo.

(2) Asbestos and Lead.

(a) The use of asbestos cement pipe shall not be allowed.

(b) Pipes and pipe fittings installed after January 4, 2014, shall be “lead free” in accordance with Section 1417 of the Federal Safe Drinking Water Act. They shall be certified as meeting ANSI/NSF 372 or Annex G of ANSI/NSF 61.

(3) Standards for Mechanical Properties.

Pipe, joints, fittings, valves, and fire hydrants shall conform to ANSI/NSF Standard 61, and applicable sections of AWWA Standards C104-A21.4-08 through C550-05 and C900-07 through C950-07.

(4) Used Materials.

Only materials that have been used previously for conveying drinking water may be reused. Used materials shall meet the above standards, be thoroughly cleaned, and be restored to their original condition.

(5) Fire Hydrants.

(a) Hydrant drains shall not be connected to, or located within, 10 feet of sanitary sewers. Where possible, hydrant drains shall not be located within 10 feet of storm drains.

(b) Auxiliary valves shall be installed in all hydrant leads.

(c) Hydrant drains shall be installed with a gravel packet or dry well unless the natural soils will provide adequate drainage.

(6) Air Relief Valves and Blow-Offs.

(a) At high points in water mains where air can accumulate, provisions shall be made to remove air by means of hydrants or air relief valves.

(b) The open end of the air relief vent pipe from automatic valves shall be provided with a #14 mesh, non-corrodible screen and a downward elbow, and where possible, be extended to at least one foot above grade. Alternatively, the open end of the pipe may be extended to as little as one foot above the top of the pipe if the valve’s chamber is not subject to flooding, or if it meets the requirements of (7) Chamber Drainage.

(c) Blow-offs or air relief valves shall not be connected directly to a sewer.

(d) Adequate number of hydrants or blow-offs shall be provided

to allow periodic flushing and cleaning of water lines.

(e) The air relief valve shall be installed in a manner to prevent it from freezing. A shut-off valve shall be provided to permit servicing of an[~~y~~] air relief valve.

(7) Chamber Drainage.

(a) Chambers, pits, or manholes containing valves, blow-offs, meters, or other such appurtenances to a distribution system, shall not be connected directly to a storm drain or sanitary sewer.

(b) Chambers shall be provided with a drain to daylight, if possible. Where this is not possible, underground gravel-filled absorption pits may be used if the site is not subject to flooding and conditions will assure adequate drainage. Sump pumps may also be considered if a drain to daylight or absorption pit is not feasible.

(8) Control Valve Stations

(a) Pressure Reducing Valves (PRVs)

(i) Isolation Valves shall be installed on both sides of the pressure reducing valve.

(ii) Where variable flow conditions will be encountered, consideration shall be given to providing parallel PRV lines to accomidate low and high flow conditions.

(b) Backflow Devices

Installation of Backflow devices shall conform to the State-adopted plumbing code.

(c) Meters

Meter installation shall conform to the State-adopted plumbing code and local jurisdictional standards.

R309-550-7. Separation of Water Mains and Transmission Lines from Sewers.

(1) Basic Separation Standards.

(a) The horizontal distance between water lines and sanitary sewer lines shall be at least 10 feet. Where a water main and a sewer line must cross, the water main shall be at least 18 inches above the sewer line. Separation distances shall be measured edge-to-edge (i.e. from the nearest edges of the facilities).

(b) Water mains and sewer lines shall not be installed in the same trench.

(c) Where local conditions make it impossible to install water or sewer lines at separation distances required by subsection (a), the sewer pipes are in good condition, and there is not high groundwater in the area, it may be acceptable if the design includes a minimum horizontal separation of 6 feet and a minimum vertical clearance of 18 inches with the waterline being above. In order to determine whether the design is acceptable, the following information shall be submitted as part of the plans for review.

(i) reason for not meeting the minimum separation standard;

(ii) location where the water and sewer line separation is not being met;

(iii) horizontal and vertical clearance that will be achieved;

(iv) sewer line information including pipe material, condition, size, age, type of joints, thickness or pressure class, whether the pipe is pressurized or not, etc.;

(v) water line information including pipe material, condition,

size, age, type of joints, thickness or pressure class, etc.;

(vi) ground water and soil conditions; and,

(vii) any mitigation efforts.

(d) If the basic separation standards as outlined in subsections (a) though (c) above cannot be met, an exception to the rule can be applied for with additional mitigation measures to protect public health, in accordance with R309-105-6(2)(b).

(3) Special Provisions.

The following special provisions apply to all situations:

(a) The basic separation standards are applicable under normal conditions for sewage collection lines and water distribution mains. More stringent requirements may be necessary if conditions such as high groundwater exist.

(b) All water transmission lines that may become unpressurized shall not be installed within 20 feet of sewer lines.

(c) In the installation of water mains or sewer lines, measures shall be taken to prevent or minimize disturbances of the existing line.

(d) Special consideration shall be given to the selection of pipe materials if corrosive conditions are likely to exist or where the minimum separation distances cannot be met. These conditions may be due to soil type, groundwater, and/or the nature of the fluid conveyed in the conduit, such as a septic sewage which produces corrosive hydrogen sulfide.

(e) Sewer Force Mains

(i) When a new sewer force main crosses under an existing water main, all portions of the sewer force main within 10 feet (horizontally) of the water main shall be enclosed in a continuous sleeve.

(ii) When a new water main crosses over an existing sewer force main, the water main shall be constructed of pipe materials with a minimum rated working pressure of 200 psi or equivalent pressure rating.

(4) Water Service Laterals Crossing Sewer Mains and Laterals.

Water service laterals shall conform to all requirements given herein for the separation of water and sewer lines.

R309-550-8. Installation of Water Mains.

(1) Standards.

The specifications shall incorporate the provisions of the manufacturer's recommended installation procedures or the following applicable standards:

(a) For ductile iron pipe, AWWA Standard C600-10, Installation of Ductile Iron Water Mains and Their Appurtenances;

(b) For PVC pipe, ASTM D2774, Recommended Practice for Underground Installation of Thermoplastic Pressure Piping and PVC Pipe and AWWA Manual of Practice M23, 2003;

(c) For HDPE pipe, ASTM D2774, Recommended Practice for Underground Installation of Thermoplastic Pressure Piping and AWWA Manual of Practice M55, 2006; and,

(d) For Steel pipe, AWWA Standard C604-11, Installation of Buried Steel Water Pipe- 4 inch and Larger.

(2) Bedding.

A continuous and uniform bedding shall be provided in the trench for all buried pipe. Stones larger than the backfill materials described below shall be removed for a depth of at least 6 inches below the bottom of the pipe.

(3) Backfill.

Backfill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe. The material and backfill zones shall be as specified by the standards referenced in Subsection (1), above. As a minimum:

(a) for plastic pipe, backfill material with a maximum particle size of 3/4 inch shall be used to surround the pipe; and,

(b) for ductile iron pipe, backfill material shall contain no stones larger than 2 inches.

(4) Dropping Pipe into Trench.

Under no circumstances shall the pipe or accessories be dropped into the trench.

(5) Burial Cover.

All water mains shall be covered with sufficient earth or other insulation to prevent freezing, unless they are part of a non-community system that can be shut-down and drained during winter months when temperatures are below freezing.

(6) Thrust Blocking.

All tees, bends, plugs, and hydrants shall be provided with thrust blocking, anchoring, tie rods, or restraint joints designed to prevent movement. Restraints shall be sized to withstand the forces experienced.

(7) Pressure and Leakage Testing.

All types of installed pipe shall be pressure tested and leakage tested in accordance with AWWA Standard C600-10.

(8) Surface Water Crossings.

(a) Above Water Crossings

The pipe shall be adequately supported and anchored, protected from damage and freezing, and accessible for repair or replacement.

(b) Underwater Crossings

(i) A minimum cover of 2 feet or greater, as local conditions may dictate, shall be provided over the pipe.

(ii)When crossing water courses that are greater than 15 feet in width, the following shall be provided:

(A)Pipe with joints shall be of special construction, having restrained joints for joints within the surface water course and flexible restrained joints at both edges of the water course.

(B)Isolating valves shall be provided on both sides of the water crossing[~~s~~]at locations not subject to high ground water or flooding, so that the section can be isolated for testing or repair.

C) A means shall be provided, such as a sampling tap, not subject to flooding, to allow for representative water quality testing on the upstream and downstream side of the crossing.

(D) A means shall be provided to pressure test the underground water crossing pipe.

(9) Sealing Pipe Ends During Construction.

The open ends of all pipelines under construction shall be covered and effectively sealed at the end of the day's work.

(10) Disinfecting Water Lines.

All new water mains or appurtenances shall be disinfected in accordance with AWWA Standard C651-05 or a method approved by the Director. The specifications shall include detailed procedures for the adequate flushing, disinfection and microbiological testing of all water mains. On all new and extensive distribution system construction, evidence of satisfactory disinfection shall be provided to the Division. Samples for coliform analyses shall be collected after disinfection is complete and the system is refilled with drinking water. A standard heterotrophic plate count is advisable. The use of water for public drinking water purposes shall not commence until the bacteriologic tests indicate the water is free from contamination.

R309-550-9. Cross Connections and Interconnections.

(1) Physical Cross Connections.

There shall be no physical cross connections between the distribution system and pipe, pumps, hydrants, or tanks that may be contaminated from any source,including pressurized irrigation.

(2) Recycled Water.

Neither steam condensate nor cooling water from engine jackets or other heat exchange devices shall be returned to the drinking water supply.

(3) System Interconnects.

The interconnections between different drinking water systems shall be reviewed and approved by the Director.

R309-550-10. Water Hauling.

(1) Community Water Systems.

Water hauling is not an acceptable permanent source for drinking water distribution in Community Water Systems.

(2) Non-Community Systems.

The Director may allow water hauling for Non-Community Public Water Systems by special approval if:

(a) consumers can not otherwise be supplied with good quality drinking water; or,

(b) the nature of the development, or ground conditions, are such that the placement of a pipe distribution system is not justified. Proposals for water hauling shall be submitted to, and approved by, the Director.

(3) Emergencies.

Water hauling may be a temporary means of providing drinking water in an emergency. Water systems shall notify the Division as soon as possible of such emergencies.

R309-550-11. Service Connections and Plumbing.

(1) Service Taps.

Service taps shall not jeopardize the quality of the system's water.

(2) Plumbing.

(a) Water services and plumbing shall conform to the State-adopted Plumbing Code.

(b) Pipes and pipe fittings installed after January 4, 2014, shall be “lead-free” in accordance with Section 1417 of the federal Safe Drinking Water Act. They shall be certified meeting the ANSI/NSF

372 or Annex G of ANSI/NSF 61.

(3) Individual Home Booster Pumps.

Individual booster pumps shall not be allowed for individual service from the public water supply mains. Exceptions to the rule may be granted by the Director if it can be shown that the granting of such an exception will not jeopardize the public health.

(4) Service Lines.

(a) Service lines shall be capped until connected for service.

(b) The portion of the service line under the control of the water system is considered to be part of the distribution system.

(5) Service Meters and Building Service Line.

Connections between the service meter and the home shall be in accordance with the State-adopted Plumbing Code.

R309-550-12. Transmission Lines.

(1) Unpressurized Flows.

Transmission lines shall conform to all applicable requirements in this rule. Transmission line design shall minimize unpressurized flows.

(2) Proximity to Concentrated Sources of Pollution.

A water system shall not install an unpressurized transmission line less than 20 feet from a concentrated source of pollution (e.g., septic tanks and drain fields, garbage dumps, pit privies, sewer lines, feed lots, etc.). Furthermore, unpressurized transmission lines shall not be placed in boggy areas or areas subject to the ponding of water.

R309-550-13. Operation and Maintenance.

(1) Disinfection After Line Repair.

The disinfection procedures of Section 4.7, AWWA Standard C651-05 shall be followed if a water main is cut or repaired.

(2) Cross Connections.

The water system shall not allow a connection that may jeopardize water quality. Cross connections shall be eliminated by physical separation, an air gap, or an approved and properly operating backflow prevention assembly.

The water system shall have an ongoing cross connection control program in compliance with R309-105-12.

(3) ANSI/NSF Standards.

All pipe and fittings used in routine operation and maintenance shall be ANSI-certified as meeting NSF Standard 61 or Standard 14.

(4) Seasonal Operation.

Water systems operated seasonally shall be disinfected and flushed according to AWWA Standard C651-05 for pipelines and AWWA Standard C652-11 for storage facilities prior to each season's use. A satisfactory bacteriologic sample shall be obtained prior to use. During the non-use period, care shall be taken to close all openings into the system.

KEY: drinking water, transmission and distribution pipelines, connections, water hauling
Date of Enactment or Last Substantive Amendment: November 10, 2014
Notice of Continuation: March 22, 2010

Authorizing, and Implemented or Interpreted Law: 19-4-104

Agenda Item 11(A)

Proposed DWB 2015 Meeting Schedule

Drinking Water Board Meetings have historically been held on the 2nd Friday of the month in January, May, July, and November. Meetings are also held in conjunction with Rural Water Association of Utah conferences in February and August.

For calendar year 2015 the corresponding dates are as follows:

Friday, January 9

Thursday, February 26 (RWAU Annual Conference, St. George)

Friday, May 8

Friday, July 10

Wednesday, August 26 (RWAU Northern Conference, Layton)

Friday, November 13

Friday, January 8