bear valley
WATER DISTRICT
PO Box 5027, Bear Valley, CA 95223
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January 30, 2018

Mohammad Farhad
Compliance and Enforcement Section
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

SUBJECT: eSMR^2 ANNUAL SELF-MONITORING REPORT SUBMITTAL FOR 2017
FOR BEAR VALLEY WATER DISTRICT, BEAR VALLEY WATER DISTRICT WWTP
ALPINE COUNTY, ORDER R5-2016-0045, NPDES No. CA0085146

This letter documents the electronic transmittal of the 2017 Annual Monitoring Report.

Choose one:

√ There were no violations of waste discharge requirements during the reporting period.

□ The following violations of waste discharge requirements occurred during the reporting period, as described below:

The following documents are found as attachments to the electronic submittal: **2017 Annual Report**.

Please do not hesitate to contact me at (209) 753-2112 if there are any questions.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 C.F.R. § 122.22(d).)

Sincerely,

Jeff Gouveia
General Manager

Note: Per Standard Provisions, Reporting sections V.B.2 and V.B.3, the LRO must be a principal executive officer or ranking elected official of the Discharger's agency, or a duly authorized representative that meets the intent of 40 CFR 122.22(b)(2).

BEAR VALLEY WATER DISTRICT
2017 ANNUAL OPERATIONS REPORT

Order # R5-2016-045-01

January 30, 2018

Table of Contents

SECTION 1 - INTRODUCTION AND BACKGROUND

1.1 Introduction

The Bear Valley Water District (District) provides sanitary sewer collection, treatment and disposal services for approximately 650 residential and commercial equivalent dwelling units (EDUs) in the Alpine County community of Bear Valley. The District's service area is comprised of approximately 3000 acres located primarily north of California State Highway 4. The District serves the developed private, residential and commercial areas of the Bear Valley village as well as the developed adjoining federal recreational lands including the United States Forest Service's (USFS) Lake Alpine Resort and campgrounds, special use permit (SUP) residential cabins and the Bear Valley Mountain downhill ski resort. The District's wastewater treatment and disposal facility (WWTF) is regulated by the Central Valley Regional Water Quality Control Board (Regional Board) under Waste Discharge Requirements (WDRs) Order No. 5-01-208 and Order No. R5-2016-0045-01.

1.2 Background

During the 2017 water year (October 2016 to September 2017), an annual daily average flow of approximately 0.099 million gallons per day (MGD) (approximately 36.46 MG total) was received at the District WWTF. WDRs Order No. 5-01-208 currently limit influent flow to 0.1 MGD (annual average basis).

Preliminary treatment at the District's main pump station (headworks) consists of shredding (comminutor) and grit removal before the influent reaches the primary sedimentation tank where the settable solids are allowed to fall to the bottom of the tank. Effluent flow is then measured through an Endress and Hauser magnetic flow tube during transfer via three, 10 horse power (HP) Paco pumps to a 14.18 million gallon (MG) two cell, aerated treatment lagoon for secondary biological nutrient removal. While in the two cell lagoon system, the constituents are largely consumed and/or sequestered. Air is delivered to the secondary treatment lagoon via one 40 HP, variable frequency drive (VFD) equipped Gardner Denver positive displacement blower to thirty six (36) – 9' high, 18" diameter, submerged helixor, coarse bubble diffusers. Inline YSI sensors communicate with the VFD blower by way of the SCADA system to keep dissolved oxygen (DO) and suspended solids (TSS) at optimum levels. Treated effluent from the aerated lagoon is then chlorinated during transfer via (2) - 375 gallon per minute (GPM) Paco pumps through a 12,000 gallon chlorine contact tank. The chlorinated effluent is then placed into storage and receives further treatment in a 76.4 MG effluent polishing reservoir.

During the irrigation season, typically late spring through early autumn, the polished effluent is disposed of through spray irrigation on up to approximately 80 acres of sprayfields: 40 acres of land which is authorized by Special Use Permit (SUP) from the USFS and 40 acres under private lease through 2048. Both the leased disposal area and the permitted land have been in service since before the installation of the groundwater monitoring wells (approximately 40 years for the leased land) at the site.

Based on the volume of effluent in storage and available to apply to land at the beginning of the land application cycle, a determination is made on the number of acres of land to irrigate. At the beginning of the 2017 land disposal season with approximately 20 MG of effluent in storage, spray fields areas 1 through 6 (27.8 total acres) were placed into operation.

Effluent disposal via spray irrigation involves the disbursement of the effluent through low impact, high uniformity, Nelson sprinkler heads upon soils and vegetation within the disposal area. The average monthly application rates to the 27.8 acre spray field area during the peak disposal months of 2017 ranged from approximately 2.34 MG – 7.49 MG per month (0.084 MG – 0.269 MG per acre per month). The water is allowed to percolate into the soil and evapotranspirate into the atmosphere. WDRs Order No. 5-01-208 limit application of wastewater to reasonable rates considering soil, climate, and irrigation management system.

SECTION 2 - NPDES PERMIT REQUIREMENTS

The District's NPDES Permit contains Final Effluent Limitations on the discharge from the storage reservoir (EFF-001) as well as receiving water limitations to Bloods Creek. In 2007 the outfall project was completed to allow discharge pursuant to the District's current NPDES Permit (WDRs Order No. R5-2016-0045-01 (adopted 24 June 2016 and effective 1 August 2016), which requires a minimum dilution ratio of 20:1 as a daily average and prohibits discharges to Bloods Creek between July 1 and December 31 each year. Pursuant to the WDRs and MRP in Order No. R5-2016-0045-01, the District discharged effluent to Bloods Creek during the months of March, April, May and June 2017.

Provision IX.B of the District's Monitoring & Reporting Program (MRP) requires the District to electronically submit self-monitoring reports (eSMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site. The District submitted monthly SMR's including the results of all required monitoring on or before the due date according to the reporting schedule of the current Order. On November 20, 2017, the Central Valley Water Board

staff reviewed the electronic self-monitoring reports (eSMRs) for the surface water discharge permitted by the Discharger for the March 2017 through August 2017 monitoring periods and identified no violations of the WDRs or MRP from review of the eSMRs.

Special provision section VI.C.6.a of the Order also requires Notification of Discharge be submitted by telephone at least 24 hours prior to initiating a discharge to Bloods Creek. The special provision requires the Discharger to notify the following agencies:

1. Central Valley Water Board;
2. Stockton East Water District; and
3. State Water Board, Division of Drinking Water, District 10.

On March 3, 2017 prior to initiating discharge to Bloods Creek on March 6, the District notified each agency and therefore satisfied the Notification of Discharge requirements.

SECTION 3 - FACILITY CONTACT INFORMATION AND WASTEWATER TREATMENT PLANT OPERATOR CERTIFICATIONS

3.1 Facility Contact Information

Bear Valley Water District
P.O. Box 5027
Bear Valley, CA 95223

Administrative Contact: Jeff Gouveia, General Manager
Phone: (209) 753-2112
Fax: (209) 753-6267

Routine Contact: Jeff Gouveia, General Manager
Phone: (209) 753-2112
Fax: (209) 753-6267

Emergency Contact: Jeff Gouveia, General Manager
Emergency Contact Phone: (209) 743-0836

3.2 District Operator Certifications & Responsibilities

Three District staff members are currently certified operators. Brief summaries of staff certifications and responsibilities are as follows:

Jeff Gouveia, General Manager – Grade I-41218, oversees all phases of operations and administration of District.

Guy West, Grade II-28912, Chief Plant Operator, performs day to day operational tasks, treatment, collections, and land application. Mr. West is responsible for all phases of operations.

Steven Mikesell, Grade II-28053, Field Supervisor, oversees land application, treatment, and collections.

Robin Murphy, Grade I-10626, performs day to day operational tasks related to treatment, collections, and land application.

SECTION 4 - INSTRUMENT CALIBRATION

According to the General Monitoring Provisions of the District's NPDES MRP, all instruments must be calibrated at least annually or according to the instrument manufacturer's instructions. The following flow monitoring and field instruments were calibrated in 2017:

Main Pump Station (Headworks)

Instrument	Calibration
Hach Sigma 980 Permanent Open Channel Flow Meter	Not required per manufacturer
Endress and Hauser - W400 8" Magnetic Flow Meter	New Flow Tube Installed & Calibrated October 2017
GLI pH Analyzer	September 2017 Annually by Staff
Keller Submersible Level Transmitter	Not required per manufacturer

Treatment Plant Control Building

Instrument	Calibration
YSI Dissolved Oxygen Analyzer Pond Monitoring	September 2017 Annually by Staff
YSI Suspended Solids Analyzer Pond Monitoring	September 2017 Annually by Staff
Portable Dissolved Oxygen Probe Pond and Creek Monitoring	Weekly by staff
Portable pH Probe Pond and Creek Monitoring	Weekly by staff
Hach Model 2100N Laboratory Turbidimeter	Quarterly by staff
Hach Auto Cat 9000 Chlorine Amperometric Titrator	Weekly by staff
Keller Submersible Level Transmitter Treatment Lagoon	Not required per manufacturer

KPSI Submersible Level Transmitter Polishing Reservoir	Not required per manufacturer
Endress & Hauser 4" Magnetic Flow Meter Pond Transfer – Treatment > Storage Reservoir	Not required per manufacturer
Siemens CFC Chlorine Residual Analyzer Pond Disinfection Monitoring	Weekly By Staff

Surface Water Discharge Components

Instrument	Calibration
GLI pH Analyzer Surface Water Discharge	September 2017 Annually by Staff
ATI Chlorine Residual Analyzer Surface Water Discharge	New Analyzer Installed & Calibrated October 2017
ATI Sulfite Residual Analyzer Surface Water Discharge	New Analyzer Installed & Calibrated October 2017
PMC Submersible Level Transmitter Bloods Creek - Surface Water Discharge	Not required per manufacturer
Endress & Hauser Magnetic Flow Meter Surface Water Discharge	Not required per manufacturer

Land Application Components

Instrument	Calibration
McCrometer 4" Bolt On Saddle Meters Sprayfield Flow Meters	Every 4-5 years with average flows and usage per manufacturer – Last calibrated in 2017

Lake Alpine Boat Ramp Lift Station

Instrument	Calibration
Blue Ribbon Submersible Level Transmitter	Not required per manufacturer

SECTION 5 – OPERATION AND MAINTENANCE MANUAL

The District maintains a current Operation and Maintenance (O&M) Manual as well as a current Contingency Plan for the all the facilities managed by the District. These items are reviewed annually each November and updated as necessary.

District staff last reviewed for accuracy and revised as necessary the Operation and Maintenance Manual as well as a Contingency Plan in November 2017 ensuring these items reflect the wastewater treatment plant as currently constructed and operated.

SECTION 6 – SUMMARIES OF MONITORING DATA

Provision X.C.4.e of the District's Monitoring & Reporting Program indicates tabular and graphical summaries shall be submitted upon written request by the Central Valley Water Board. No such request was received by the District in 2017.

SECTION 7 – VIOLATIONS AND CORRECTIVE ACTIONS

7.1 Notices of Violation

No Notices of Violation were received in 2017.

7.2 Corrective Actions

No notices of corrective action were received in 2017.

7.3 Technical Reports

The District completed and submitted the following technical and other documents as required by the NPDES Permit during 2017:

1. 2016 Annual Operations Report submitted – Submitted January 30, 2017
2. Request for Clarification in MRP of Order R5-2016-0045 - Submitted February 22, 2017
3. First Tri-Annual Groundwater Monitoring Report - Submitted August 21, 2017
4. Updated Bloods Creek Dilution/Mixing Zone Study - Submitted September 20, 2017
5. Second Tri-Annual Monitoring Reports - Submitted October 30, 2017
6. Third Tri-Annual Monitoring Reports - Submitted January 16, 2018

SECTION 8 – SLUDGE/SOLID WASTE DISPOSAL

8.1 Treatment Lagoon

Effluent is transferred from the District's headworks following preliminary treatment to a 14.18 million gallon (MG) two cell, aerated treatment lagoon for secondary biological nutrient removal. While in the two cell lagoon system, the solids are largely consumed and/or sequestered as air is delivered to the secondary treatment lagoon to thirty six (36) - 9' high, 18" diameter, submerged helixor, coarse bubble diffusers. The aeration and mixing strategy employed by the District suspends solids sufficiently for successful floc formation permitting efficient biological consumption of most solids.

Limited sludge at the WWTF has accumulated at the bottom of the two cell treatment lagoon since 1972. The sludge depth at the bottom of the treatment pond is measured with a sludge judge annually. Sludge measurement in September 2017 revealed that the sludge has not exceeded six inches on average and is more commonly one to three inches in most portions of the 270' x 280' square lagoon.

In July 2016, staff also performed a sonar scan and analysis of the bottom of the treatment lagoon. This scan revealed some larger sludge accumulation on the sides of the baffle wall as well as around the 9' high, 18" diameter helixors where ostensibly the mixers cannot properly suspend the solids.

In general, the organic solids loading rate on the pond system appears to be so low compared to their natural decay and consumption rate that no material accumulation of sludge appears to have occurred over the past 40+ years. At some point in the distant future, the treatment ponds may require sludge to be removed and disposed of at an appropriate landfill.

8.2 Lift Stations

At the headworks of the WWTF, the most common materials generated generally include grease, sediment, and minor non-organic solid waste. The items not shredded during pretreatment are removed as necessary from the waste stream and disposed of in local, municipal waste transfer stations bound for landfill. Meanwhile, annual organic solids removal at all four (4) District lift stations, totaling approximately 1500 – 2000 gallons, is routinely performed

each September or October and was completed this year by El Dorado Septic on September 21, 2017.

BEAR VALLEY WATER DISTRICT, 2017 ANNUAL OPERATIONS REPORT

Appendix A. 2017 Water Balance – Prepared August 2, 2017

APPENDIX A 2017 WATER BALANCE

BEAR VALLEY WATER DISTRICT WASTEWATER TREATMENT AND DISPOSAL SYSTEM 1/29/2018 13:13

(2017 update- 2011 Precip. Pattern) 1 in 100 Year Water Balance Projection - 2000 thru 5/2016 90TH Percentile monthly ADF plus 1196 RLU (201 gpd/RLU) - Assumes no infiltratin with new RLUs

INPUT DATA

TREATMENT POND CHARACTERISTICS		STORAGE RESERVOIR		IRRIGATION AREA CHARACTERISTICS		CLIMATOLOGICAL FACTORS	
GROSS AREA (ac)	3.2	GROSS AREA (ac)	18.6	DISTRICT DISPOSAL LAND (AC)	80		
WATER SURFACE AREA (ac)	2.9	MAX. WATER SURFACE (ac)	14.2	SOIL WATER DEFICIT BEFORE IRRIGATION (IN)	n/a	OCT-APR EVAP/AVG EVAP RATIO	0.76
				FRACT OF LAND IRRIGATED	n/a	MAY-SEP EVAP/AVG EVAP RATIO	1.00
		STORAGE CAPACITY (MG)	76.43	IRRIGATION EFFICIENCY (DECIMAL FRACT)	n/a	PAN COEFFICIENT	0.80
		FRAC EST. PERC	1.0	FRACTION OF EST. PERC RATE	n/a	LAND PRECIP COLLECTED (FRAC)	0.9

PARAMETER / MONTH	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
DAYS IN MONTH	30	31	31	28	31	30	31	30	31	31	30	31	365
AVG PAN EVAP (IN)	0.89	0.61	0.76	0.83	2.14	3.69	5.34	6.64	7.63	6.87	5.17	3.05	43.62
ESTIMATED PRECIP (IN)	10.66	20.00	2.84	10.62	21.42	3.37	4.65	1.57	1.66	0.00	1.86	4.35	83.00
ESTIMATED SNOW ACCUM (IN Water)$_{(g)}$	7.82	23.83	26.08	36.04	53.71	41.62	22.88	0.00	0.00	0.00	0.00	2.96	
ESTIMATED SNOW MELT IN MONTH (IN Water)	0.00	0.00	0.36	0.12	0.71	13.40	21.11	22.88	0.00	0.00	0.00	1.42	60.00
ESTIMATED NEW SNOW IN MONTH (IN Water)	7.82	16.01	2.61	10.08	18.38	1.30	2.37	0.00	0.00	0.00	0.00	1.53	60.11
ESTIMATED MAX PERCOLATION (IN)$_{(a)}$	10.0	29.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
# OF ADDITIONAL CONNECTIONS (RLU)	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	
ADDITIONAL INFLUENT FLOW (GAL/D)	240,396	240,396	240,396	240,396	240,396	240,396	240,396	240,396	240,396	240,396	240,396	240,396	
90TH PERCENTILE EXISTING FLOWS (Avg. GAL/D)	35,340	75,835	83,020	108,476	123,884	184,549	184,888	125,446	74,976	64,231	40,142	32,953	
TOTAL INFLUENT FLOW (GAL/D)	275,736	316,231	323,416	348,872	364,280	424,945	425,284	365,842	315,372	304,627	280,538	273,349	

CALCULATIONS

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
WASTEWATER VOLUME (gal)	8,272,080	9,803,161	10,025,896	9,768,416	11,292,680	12,748,350	13,183,804	10,975,260	9,776,532	9,443,437	8,416,140	8,473,819	122,179,575
EVAPORATION (IN)	0.5	0.4	0.5	0.5	1.3	2.2	4.3	5.3	6.1	5.5	4.1	1.9	32.6
PRECIPITATION (IN)	10.66	20.00	2.84	10.62	21.42	3.37	4.65	1.57	1.66	0.00	1.86	4.35	83.00
TREATMENT POND													
PERCOLATION (IN)	8.38	5.41	12.69	7.74	5.73	21.66	15.57	17.29	4.18	2.11	2.81	2.97	106.55
PERC VOLUME (gal)	659,620	426,378	999,502	609,371	451,372	1,705,370	1,226,247	1,361,614	329,361	166,362	221,115	233,864	8,390,176
EVAP. VOLUME (gal)	39,374	31,499	39,374	39,374	102,372	173,244	338,614	417,361	480,359	433,111	322,864	149,620	2,567,166
PRECIP. VOLUME (gal)	917,603	1,721,582	244,465	914,160	1,843,814	290,087	400,268	135,144	142,891	0	160,107	374,444	7,144,564
TREATMENT DISPOSAL(GAIN)/ (gal)	218,609	1,263,705	(794,411)	265,415	1,290,070	(1,588,528)	(1,164,593)	(1,643,831)	(666,829)	(599,473)	(383,872)	(9,040)	(3,812,778)
POLISHING RESERVOIR													
PERCOLATION (IN)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERC VOLUME (gal)	0	0	0	0	0	0	0	0	0	0	0	0	0
W.S. AREA (ac)$_{(b)}$	6.20	9.37	11.21	11.71	12.19	12.46	11.02	10.79	9.80	9.69	6.30	2.57	
EVAP. VOLUME (gal)	84,162	101,769	152,244	158,953	430,172	744,194	1,286,794	1,553,151	1,623,738	1,446,786	700,934	132,594	8,415,492
PRECIP. VOLUME (gal)	5,032,887	9,614,764	1,379,515	5,172,859	10,461,230	1,648,344	2,256,279	760,823	799,978	0	878,649	2,010,894	40,016,223
MONTHLY AVAIL. SNOWMELT (IN)$_{(c)}$	0.00	0.00	0.36	0.12	0.71	13.40	21.11	22.88	0.00	0.00	0.00	1.42	60.00
ESTIMATED SNOW CONTR. (%)$_{(d)}$	0%	0%	0%	0%	0%	0%	45%	28%	50%	50%	50%	50%	
ESTIMATED AREA OF INFLUENCE (ac)	50	50	50	50	50	50	50	50	50	50	50	50	
ESTIMATED INFLUX TO STORAGE (gal)$_{(e)}$	0	0	0	0	0	0	12,897,727	8,697,780	0	0	0	966,122	22,561,629
RESERVOIR DISPOSAL(GAIN) (gal)	4,948,725	9,512,995	1,227,271	5,013,906	10,031,058	904,150	13,867,212	7,905,452	(823,760)	(1,446,786)	177,715	2,844,422	54,162,360
IRRIGATION													
IRRIGATION DISPOSAL (gal)$_{(f)}$	0	0	0	0	0	0	0	0	10,796,000	22,361,000	17,521,000	11,999,000	62,677,000
STORAGE													
BEGINNING STORAGE (gal)	4,060,000	17,499,415	38,079,276	44,138,032	50,185,768	53,699,576	35,763,549	33,049,972	21,686,853	19,176,796	4,212,974	0	
CALCULATED STORAGE GAIN (gal)	13,439,415	20,579,861	10,458,756	15,047,737	22,613,808	12,063,973	25,886,423	17,236,881	-2,510,057	-14,963,822	-9,311,017	-689,799	
PROJECTED ESTIMATED STORAGE (gal)	17,499,415	38,079,276	48,538,032	59,185,768	72,799,576	65,763,549	61,649,972	50,286,853	19,176,796	4,212,974	0	0	
AMOUNT DISCHARGED TO BLOODS CREEK (gal)	0	0	4,400,000	9,000,000	19,100,000	30,000,000	28,600,000	28,600,000	0	0	0	0	119,700,000
ESTIMATED STORAGE (gal)	17,499,415	38,079,276	44,138,032	50,185,768	53,699,576	35,763,549	33,049,972	21,686,853	19,176,796	4,212,974	0	0	

MAXIMUM STORAGE (MG) 53.70

AVAILABLE STORAGE (MG) 76.43

SUMMARY

ANNUAL INFLOW (MG)		ANNUAL OUTFLOW POTENTIAL (MG)	
WASTEWATER	122.18	AMOUNT DISCHARGED TO BLOODS CREEK	119.70
PRECIPITATION	47.16	EVAPORATION	10.98
SNOW INFLUX (MG)	22.56	PERCOLATION	8.39
TOTAL	191.90	IRRIGATION	62.68
		TOTAL	201.75

OVERALL BALANCE	
UNUSED DISPOSAL CAPACITY (MG)	5.79
(MUST NOT BE NEGATIVE)	
UNUSED STORAGE CAPACITY (MG)	22.73
(MUST NOT BE NEGATIVE)	

(a) Estimated percolation based upon measured inflow components, estimated evaporation, and actual reservoir levels in 2011 - in Storage Reservoir only.

(b) Reservoir water surface area is a function of storage volume at start of month.

(c) Estimated snowmelt volume available for influx to storage reservoir.

(d) Estimated percentage of snowmelt contributing to influx to reservoir.

(e) Estimated based on fraction of accumulated snow within reservoir "area of influence" entering the reservoir during snowmelt months.

(f) Disposal capacity based on maximum estimated land disposal volumes.

(g) Per Bloods Creek Gauging Station

(h) Not used in calculations

BEAR VALLEY WATER DISTRICT WASTEWATER TREATMENT AND DISPOSAL SYSTEM 1/29/2018 13:14

(2017 update - 2017 Precip. Pattern) 1 in 100 Year Water Balance Projection - 2000 thru 5/2016 90TH Percentile monthly ADF plus 1196 RLU (201 gpd/RLU) - Assumes no infiltratin with new RLUs

INPUT DATA

TREATMENT POND CHARACTERISTICS		STORAGE RESERVOIR		IRRIGATION AREA CHARACTERISTICS		CLIMATOLOGICAL FACTORS	
GROSS AREA (ac)	3.2	GROSS AREA (ac)	18.6	DISTRICT DISPOSAL LAND (AC)	80		
WATER SURFACE AREA (ac)	2.9	MAX. WATER SURFACE (ac)	14.2	SOIL WATER DEFICIT BEFORE IRRIGATION (IN)	n/a	OCT-APR EVAP/AVG EVAP RATIO	0.76
				FRACT OF LAND IRRIGATED	n/a	MAY-SEP EVAP/AVG EVAP RATIO	1.00
		STORAGE CAPACITY (MG)	76.43	IRRIGATION EFFICIENCY (DECIMAL FRACT)	n/a	PAN COEFFICIENT	0.80
		FRAC EST. PERC	1.0	FRACTION OF EST. PERC RATE	n/a	LAND PRECIP COLLECTED (FRAC)	0.9

PARAMETER / MONTH	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
DAYS IN MONTH	30	31	31	28	31	30	31	30	31	31	30	31	365
AVG PAN EVAP (IN)	0.89	0.61	0.76	0.83	2.14	3.69	5.34	6.64	7.63	6.87	5.17	3.05	43.62
ESTIMATED PRECIP (IN)	3.17	8.48	30.79	22.56	5.72	9.28	1.10	1.91	0.00	0.00	0.00	0.00	83.00
ESTIMATED SNOW ACCUM (IN Water)(g)	2.23	4.46	27.12	42.39	39.69	38.40	0.00	0.00	0.00	0.00	0.00	0.00	
ESTIMATED SNOW MELT IN MONTH (IN Water)	0.82	1.06	0.00	1.29	8.10	10.33	38.40	0.00	0.00	0.00	0.00	0.00	60.00
ESTIMATED NEW SNOW IN MONTH (IN Water)	3.05	3.29	22.66	16.56	5.40	9.04	0.00	0.00	0.00	0.00	0.00	0.00	60.00
ESTIMATED MAX PERCOLATION (IN)(a)	10.0	29.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
# OF ADDITIONAL CONNECTIONS (RLU)	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	
ADDITIONAL INFLUENT FLOW (GAL/D)	240,396	240,396	240,396	240,396	240,396	240,396	240,396	240,396	240,396	240,396	240,396	240,396	
90TH PERCENTILE EXISTING FLOWS (Avg. GAL/D)	35,340	75,835	83,020	108,476	123,884	184,549	184,888	125,446	74,976	64,231	40,142	32,953	
TOTAL INFLUENT FLOW (GAL/D)	275,736	316,231	323,416	348,872	364,280	424,945	425,284	365,842	315,372	304,627	280,538	273,349	

CALCULATIONS

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL	
WASTEWATER VOLUME (gal)	8,272,080	9,803,161	10,025,896	9,768,416	11,292,680	12,748,350	13,183,804	10,975,260	9,776,532	9,443,437	8,416,140	8,473,819	122,179,575	
EVAPORATION (IN)	0.5	0.4	0.5	0.5	1.3	2.2	4.3	5.3	6.1	5.5	4.1	1.9	32.6	
PRECIPITATION (IN)	3.17	8.48	30.79	22.56	5.72	9.28	1.10	1.91	0.00	0.00	0.00	0.00	83.01	
TREATMENT POND														
PERCOLATION (IN)	8.38	5.41	12.69	7.74	5.73	21.66	15.57	17.29	4.18	2.11	2.81	2.97	106.55	
PERC VOLUME (gal)	659,620	426,378	999,502	609,371	451,372	1,705,370	1,226,247	1,361,614	329,361	166,362	221,115	233,864	8,390,176	
EVAP. VOLUME (gal)	39,374	31,499	39,374	39,374	102,372	173,244	338,614	417,361	480,359	433,111	322,864	149,620	2,567,166	
PRECIP. VOLUME (gal)	272,871	729,951	2,650,375	1,941,944	492,372	798,814	94,687	164,411	0	0	0	0	7,145,425	
TREATMENT DISPOSAL(GAIN)/ (gal)	(426,123)	272,074	1,611,500	1,293,199	(61,372)	(1,079,801)	(1,470,174)	(1,614,564)	(809,720)	(599,473)	(543,979)	(383,484)	(3,811,918)	
POLISHING RESERVOIR														
PERCOLATION (IN)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PERC VOLUME (gal)	0	0	0	0	0	0	0	0	0	0	0	0	0	
W.S. AREA (ac)(b)	6.20	9.02	10.52	12.32	13.41	13.33	12.67	12.50	10.89	10.58	9.12	6.65		
EVAP. VOLUME (gal)	84,162	97,925	142,888	167,265	473,377	796,269	1,479,375	1,799,534	1,803,763	1,580,200	1,015,010	343,175	9,782,944	
PRECIP. VOLUME (gal)	1,496,647	4,068,510	14,898,468	11,026,175	2,812,579	4,561,027	538,670	934,466	0	0	0	0	40,336,541	
MONTHLY AVAIL. SNOWMELT (IN)(c)	0.82	1.06	0.00	1.29	8.10	10.33	38.40	0.00	0.00	0.00	0.00	0.00	60.00	
ESTIMATED SNOW CONTR. (%)(d)	100%	100%	100%	100%	40%	40%	30%	0%	0%	0%	0%	0%		
ESTIMATED AREA OF INFLUENCE (ac)	50	50	50	50	50	50	50	50	50	50	50	50		
ESTIMATED INFLUX TO STORAGE (gal)(e)	1,115,930	1,434,767	0	1,753,604	4,399,951	5,611,532	15,638,956	0	0	0	0	0	29,954,738	
RESERVOIR DISPOSAL(GAIN) (gal)	2,528,414	5,405,352	14,755,579	12,612,514	6,739,152	9,376,289	14,698,250	(865,067)	(1,803,763)	(1,580,200)	(1,015,010)	(343,175)	60,508,335	
IRRIGATION														
IRRIGATION DISPOSAL (gal)(f)	0	0	0	0	0	0	0	0	10,796,000	22,361,000	17,521,000	11,999,000	62,677,000	
STORAGE														
BEGINNING STORAGE (gal)	4,060,000	14,434,371	29,914,958	51,907,933	66,582,062	65,452,522	56,497,361	54,309,241	34,204,870	30,571,918	15,474,682	4,810,833		
CALCULATED STORAGE GAIN (gal)	10,374,371	15,480,587	26,392,975	23,674,129	17,970,460	21,044,839	26,411,880	8,495,628	-3,632,951	-15,097,236	-10,663,849	-4,251,841		
PROJECTED ESTIMATED STORAGE (gal)	14,434,371	29,914,958	56,307,933	75,582,062	84,552,522	86,497,361	82,909,241	62,804,870	30,571,918	15,474,682	4,810,833	558,993	=CARRYOVER	
AMOUNT DISCHARGED TO BLOODS CREEK (gal)	0	0	4,400,000	9,000,000	19,100,000	30,000,000	28,600,000	28,600,000	0	0	0	0	119,700,000	
ESTIMATED STORAGE (gal)	14,434,371	29,914,958	51,907,933	66,582,062	65,452,522	56,497,361	54,309,241	34,204,870	30,571,918	15,474,682	4,810,833	558,993		

MAXIMUM STORAGE (MG) 66.58

AVAILABLE STORAGE (MG) 76.43

SUMMARY

ANNUAL INFLOW (MG)	
WASTEWATER	122.18
PRECIPITATION	47.48
SNOW INFLUX (MG)	29.95
TOTAL	199.62

ANNUAL OUTFLOW POTENTIAL (MG)	
AMOUNT DISCHARGED TO BLOODS CREEK	119.70
EVAPORATION	12.35
PERCOLATION	8.39
IRRIGATION	62.68
TOTAL	203.12

OVERALL BALANCE	
UNUSED DISPOSAL CAPACITY (MG)	-0.56
(MUST NOT BE NEGATIVE)	
UNUSED STORAGE CAPACITY (MG)	9.85
(MUST NOT BE NEGATIVE)	

(a) Estimated percolation based upon measured inflow components, estimated evaporation, and actual reservoir levels in 2011 - in Storage Reservoir only.

(b) Reservoir water surface area is a function of storage volume at start of month.

(c) Estimated snowmelt volume available for influx to storage reservoir.

(d) Estimated percentage of snowmelt contributing to influx to reservoir.

(e) Estimated based on fraction of accumulated snow within reservoir "area of influence" entering the reservoir during snowmelt months.

(f) Disposal capacity based on maximum estimated land disposal volumes.

(g) Per Bloods Creek Gauging Station

(h) Not used in calculations