January 30, 2023

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 ANNUAL SELF-MONITORING OPERATIONS REPORT SUBMITTAL FOR 2022
FOR BEAR VALLEY WATER DISTRICT, BEAR VALLEY WATER DISTRICT WWTP
ALPINE COUNTY, ORDER R5-2022-0037, NPDES No. CA0085146

This letter documents the electronic transmittal of the 2022 Annual Operations Report pursuant to Order R5-2022-0037, MRP Section X.D.2.

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: N/A

The following documents are found as attachments to the electronic submittal:

- **2022 Annual Operations 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
2022 ANNUAL OPERATIONS REPORT

Order # R5-2022-0037

January 30, 2023

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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. R5-2022-0037.

1.2 Background

During the 2022 water year (October 2021 to September 2022), an annual daily average flow of approximately 0.056 million gallons per day (MGD) (approximately 20.53 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 solids grinding 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 twelve (12) Triplepoint Mars T-Series Double Bubble™ fine and 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 disinfected by use of chlorine gas during transfer via (2) - 375 gallon per minute (GPM) Paco pumps through a 12,000 gallon chlorine contact tank. The disinfected 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 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 45 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 2022 land disposal season, May 27, 2022, with approximately 33.90 MG of effluent in storage, spray field areas 1 through 4 (21.75 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 21.75 acre spray field area during the peak disposal months of 2022 ranged from approximately 1.297 MG – 12.233 MG per month (0.060 MG – 0.562 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. R5-2022-0037 (adopted as amended 10 June 2022), 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. During the discharge period of January 1 to June 30, 2022, the District did not discharge effluent to Bloods Creek; therefore no effluent subject to the NPDES requirements existed during 2022.

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 28, 2022, the Central Valley Water Board compliance and enforcement unit reviewed the electronic self-monitoring reports (eSMRs) submitted by the Discharger for the June 2022 through September 2022 monitoring periods. No discharge to surface waters occurred during the period reviewed and no violations on the WDRs or MRP were identified from review of the eSMRs.

In addition, Central Valley Water Board staff conducted an inspection of the facility on June 20, 2022 to determine compliance with Order R5-2016-0045-01. The report includes a summary of the inspector's findings and an evaluation of the effectiveness in complying with the permit requirements. The report lists all eleven areas evaluated that we all found to be satisfactory. Board staff found no violations of the WDRs.

The NPDES permit requires Notification of Discharge be submitted to RWQCB and other agencies prior to initiating discharge to surface waters in any given year. Since no discharge occurred in 2022, notification was not required.

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

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

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

Guy West, Chief Plant Operator - Grade II - Certificate Number 28912, performs day to day operational tasks and oversees collection, treatment and disposal operations. Mr. West is responsible for all phases of operations.

Steven Mikesell, Field Supervisor - Grade II - Certificate Number 28053, performs day to day operational tasks related to collection, treatment and disposal operations.

Robin Murphy, Operator - Grade I - Certificate Number 10626, performs day to day operational tasks related to collection, treatment and disposal operations.

Steven Schnitter, Operator - Grade II - Certificate Number 41916, performs day to day operational tasks related to collection, treatment and disposal operations.

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 2022:

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	Not required per manufacturer
Hach sc200 pH Analyzer	Quarterly by Staff December 2022
Keller Submersible Level Transmitter	Not required per manufacturer

Treatment Plant Control Building

Instrument	Calibration
YSI Dissolved Oxygen Analyzer Pond Monitoring	Not required per manufacturer
YSI Suspended Solids Analyzer Pond Monitoring	Not required per manufacturer
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 December 2022
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	Monthly by Staff – When Discharging March 2022
ATI Chlorine Residual Analyzer Surface Water Discharge	Monthly by Staff – When Discharging March 2022
ATI Sulfite Residual Analyzer Surface Water Discharge	Monthly by Staff – When Discharging March 2022
KPSI 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 September 2022

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 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 December 2022 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 2022.

SECTION 7 – VIOLATIONS AND CORRECTIVE ACTIONS

7.1 Notices of Violation

No Notices of Violation were received in 2022.

7.2 Technical Reports

The District completed and submitted the following technical and other documents as required by the NPDES Permit during 2022:

1. 2021 Third Tri-Annual Groundwater Monitoring Report – Submitted January 24, 2022
2. 2021 Annual Operations Report submitted – Submitted January 27, 2022
3. 2022 First Tri-Annual Groundwater Monitoring Report - Submitted August 9, 2022
4. R5-2022-0037 Analytical Methods Report – MRP X.D.1 – Submitted September 28, 2022
5. 2022 Second Tri-Annual Groundwater Monitoring Report - Submitted October 12, 2022

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 twelve (12) Triplepoint Mars T-Series Double Bubble™ fine and 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 the lagoon was brought online in 1974. The sludge depth at the bottom of the treatment pond is measured annually by District staff using a combination of a sludge judge and Secchi Disc. Sludge measurements on October 7, 2022 revealed that the sludge depth ranged from approximately 6" to as much as 36". According to the solids distribution in the lagoon, there remains accumulation at the inlet, in the far ends and corners of cell 2, near the baffle wall particularly in cell 2 and in cell 2 at the point where effluent passes from cell to cell through the baffle wall from. This solids distribution pattern is reasonable based on the location of the inlet and outlet structures and the locations of highest loading correspond roughly to points historically known to trap solids.

The District completed a comprehensive upgrade to the wastewater treatment lagoon in October 2019. The scope of this upgrade included removal of the original and in some cases inoperable coarse bubble diffuser network and installation of twelve (12) new Triplepoint Mars T-Series Double Bubble™ high efficiency fine and coarse bubble diffusers in both cells. Additionally, the original cast iron buried air header that carried air to the original diffusers was abandoned and a new CPVC air header was installed. Lastly, the District replaced the original cedar baffle wall that had largely disintegrated over the last 45 years, restoring the lagoon to its original two cell design increasing the lagoons retention time and eliminating any potential for short circuiting. To date, these improvements appear to have dramatically improved overall effluent quality, modestly reduced overall sludge and largely improved energy efficiency at the WWTF.

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 extraordinary material accumulation of sludge appears to have occurred over the past 45 years. At some point in the distant future, if the lagoon upgrades do not accomplish this on their own, the treatment lagoon may require sludge to be mechanically 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. The District replaced its Chicago comminutor installed at the headworks lift station in 1989 with a Franklin Miller Taskmaster Model 8524 grinder unit. This unit is anticipated to better grind solids as they pass through this facility and potentially reduce the organic loading rates and related sludge accumulation in the District's treatment lagoon. Meanwhile, annual organic solids removal at all three (3) District lift stations is routinely performed each September or October and was completed this year by El Dorado Septic on October 6, 2022.

BEAR VALLEY WATER DISTRICT, 2022 ANNUAL OPERATIONS REPORT

Appendix A. 2020 Water Balance - Prepared May 21, 2020

APPENDIX A. 2020 WATER BALANCE

BEAR VALLEY WATER DISTRICT

MEMORANDUM

TO **Jeff Gouveia, District Manager**

FROM **Gary S. Ghio, P.E.**

RE **1 In 100 Year Water Balance – 2020 Update**

DATE **May 21, 2020**

Jeff, as requested, I have updated the District's 1 in 100 year water balance as well as calculations of District capacity based upon precipitation levels experienced since water year 2015/2016 to the present water year.

Table 1 below presents a summary of data from the Bloods Creek gauging station for Maximum Total Precipitation and Maximum Snow Water Content for this time period as well as the Department of Water Resources (DWR) 1 in 100 year levels and what was experienced in water year 2010/2011 (basis of previous 1 in 100 year water balance).

TABLE 1

Water Year	Total Precipitation (Inches)	Maximum Snow Water Content (Inches)
1 in 100	83	60
2010/2011	84.73	60.82
2015/2016	62.94	33.72
2016/2017	98.36	45.84
2017/2018	44.38	13.00
2018/2019	48.73	39.94
2019/2020 (to date)	25.32	23.24

As the can be seen from Table 1, the winter of 2016/2017 once again exceeded the total precipitation criteria for 1 in 100 year storm season. Due to this, the District proceeded with its first ever successful discharge to Bloods Creek; and in addition, obtained valid creek flow data for Bloods Creek for the entire January through June potential discharge period.

2020 WATER BALANCE UPDATE

Table 2 below presents a comparison of the total precipitation and snow water content projected in the 1 in 100-year water balances as well as what occurred during the 2010/2011 and the 2016/2017 precipitation seasons.

TABLE 2

	1 IN 100	2010/2011	2016/2017
Total Precipitation (In Inches)	83.00	84.73	98.36
Snow Water Content (In Inches)	60.00	60.82	45.84

As can be seen by the above comparisons of total precipitation and snow water content for 2010/2011 and 2016/2017, both storm seasons exceeded the 1 in 100 total precipitation level, but total precipitation was significantly higher and the snow water content was significantly lower in 2016/2017 as compared to 2010/2011.

Attached to this memorandum is the 2020 Update of the 2016/2017 water balance with actual flows/precipitation which was calibrated based upon actual storage levels encountered for November 2016 through October 2017 and the resulting 1 in 100 year water balance (see Tables 6 and 7).

As can be seen by the actual precipitation water balance, the estimated storage, predicted by the spreadsheet, tracks very closely with actual storage experienced during this time period which provides verification of the accuracy of the water balances.

As in previous water balances, the 1 in 100 year water balance was performed with updated 90th percentile collection system flows for the time period 2000 thru 2019. Based upon this balance, the District would need to discharge approximated 82 MG of wastewater to ensure the polishing pond did not overflow which is less than the actual 92 MG which was discharged in 2016/2017 as the water year exceeded the 100 year levels.

Bloods Creek Flows and Assimilative Capacity

The capacity of the District to serve additional customers is driven by the assimilative capacity of Bloods Creek flows due to the method of wastewater disposal by stream discharge in accordance with the District's NPDES permit. The following Tables 3 and 4 present summaries of Bloods Creek flows and assimilative capacity (20:1 dilution) for the potential months of discharge for both water years 2010/2011 and 2016/2017.

TABLE 3

BLOODS CREEK TOTAL FLOW (MG)						
YEAR	**JANUARY**	**FEBRUARY**	**MARCH**	**APRIL**	**MAY**	**JUNE**
2010/2011	---	---	232	736	1163	1705
2016/2017	589	806	520	911	1408	732

TABLE 4

20:1 DILUTION BLOODS CREEK FLOWS (MG)						
YEAR	**JANUARY**	**FEBRUARY**	**MARCH**	**APRIL**	**MAY**	**JUNE**
2010/2011	---	---	11.0	35.1	55.4	81.2
2016/2017	28.0	38.4	24.7	43.4	67.1	35.8

The following Table 5 presents the amounts of wastewater discharged in 2016/2017 along with remaining assimilative capacity.

TABLE 5

2016/2017 WATER YEAR : EXCESS ASSIMILATIVE CAPACITY (MG)							
	JANUARY	**FEBRUARY**	**MARCH**	**APRIL**	**MAY**	**JUNE**	**TOTAL**
Discharge Amount	0	0	15.8	29.9	29.7	16.9	
Remaining Capacity	28.0	38.4	8.9	13.5	37.4	18.9	145.1

As can be seen by Table 5 there was a total of approximately 145 MG of remaining assimilative capacity in Bloods Creek in water year 2016/2017 to support District growth and additional amounts of discharge.

District Capacity

The Regional Water Quality Control Board criteria to perform 1 in 100 year projections is to utilize a historical DWR monitoring site in order to derive the 100 year monthly distribution of precipitation. As no DWR site currently exists near Bear Valley which has this data, the previous water balances and capacity determinations were based on the monthly distribution of precipitation that was experienced in 2010/2011 which was the last year of 1 in 100 year total precipitation exceedance at that time.

The 2016/2017 precipitation year also exceeded the 1 in 100 year total precipitation amount, but the pattern differed significantly from what was experienced in 2010/2011. The 2016/2017 1 in 100 year water balance projections which are attached to this memorandum (see Table 8 and Table 9) were performed utilizing both precipitation patterns reduced down to 1 in 100 year levels along with updated 90th percentile collection system flows for 2000 thru 2019. This analysis was performed to ensure the water balances' basis is the worst case precipitation level and pattern based upon available data.

In comparing Table 8 and Table 9, the 2016/2017 precipitation pattern would have been a worst year in terms of volume of discharge required (121.5 MG) as compared to 2010/2011 (114.8 MG) but not of such significance that it would alter the previous capacity determination in 2016 of an additional 1,196 EDUs. In addition, it is anticipated that sufficient assimilative capacity exists in Bloods Creek to support this level of discharge based upon the 145 MG of excess assimilative capacity in water year 2016/017.

Should you have any questions regarding any of the information contained in this memo please let me know.

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TABLE 6

BEAR VALLEY WATER DISTRICT WASTEWATER TREATMENT AND DISPOSAL SYSTEM 6/8/2020 9:26

(2020 update) 2016/2017 Water Year - Actual Flows/Precipitation

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
ACTUAL PRECIP (IN)	3.47	9.29	33.72	26.04	6.27	10.16	1.20	2.09	0.37	1.98	3.27	0.50	98.36
ACTUAL SNOW ACCUM (IN Water)$_{(g)}$	2.28	4.56	27.72	43.32	40.56	39.24	0.00	0.00	0.00	0.00	0.00	2.76	
ACTUAL SNOW MELT IN MONTH (IN Water)	0.84	1.08	0.00	1.32	8.40	10.56	39.24	0.00	0.00	0.00	0.00	0.71	62.15
ACTUAL NEW SNOW IN MONTH (IN Water)	3.12	3.36	23.16	16.92	5.64	9.24	0.00	0.00	0.00	0.00	0.00	3.47	64.91
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	
ACTUAL INFLUENT FLOW (Avg. GAL/D)	32,967	93,548	152,032	212,250	121,032	156,800	186,581	108,700	61,097	34,742	25,633	15,032	

CALCULATIONS

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
WASTEWATER VOLUME (gal)	989,010	2,899,988	4,712,992	5,943,000	3,751,992	4,704,000	5,784,011	3,261,000	1,894,007	1,077,002	768,990	465,992	36,251,984
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)	3.47	9.29	33.72	26.04	6.27	10.16	1.20	2.09	0.37	1.98	3.27	0.50	98.36
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)	298,694	799,675	2,902,587	2,241,499	539,716	874,564	103,295	179,905	31,849	170,437	281,479	43,040	8,466,739
TREATMENT DISPOSAL(GAIN)/ (gal)	(400,299)	341,798	1,863,711	1,592,754	(14,028)	(1,004,051)	(1,461,566)	(1,599,070)	(777,871)	(429,036)	(262,501)	(340,445)	(2,490,604)
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)$_{(b)}$	7.16	8.28	9.48	11.44	13.13	12.76	11.50	10.65	9.14	7.98	4.74	3.98	
EVAP. VOLUME (gal)	97,240	89,947	128,649	155,286	463,341	762,439	1,342,302	1,532,791	1,513,460	1,192,525	528,252	205,171	8,011,403
PRECIP. VOLUME (gal)	1,647,361	4,438,600	16,220,186	12,664,636	3,078,178	4,977,915	583,815	1,012,012	177,639	944,417	1,530,949	233,047	47,508,757
MONTHLY AVAIL. SNOWMELT (IN)$_{(c)}$	0.84	1.08	0.00	1.32	8.40	10.56	39.24	0.00	0.00	0.00	0.00	0.71	62.15
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)$_{(e)}$	1,140,480	1,466,331	0	1,792,183	4,561,920	5,734,985	15,983,013	0	0	0	0	0	30,678,912
RESERVOIR DISPOSAL(GAIN) (gal)	2,690,601	5,814,985	16,091,537	14,301,533	7,176,758	9,950,461	15,224,525	(520,779)	(1,335,820)	(248,108)	1,002,697	27,876	70,176,266
IRRIGATION													
IRRIGATION DISPOSAL (gal)$_{(f)}$	0	0	0	0	0	0	0	0	7,486,000	6,228,000	2,337,000	0	16,051,000
STORAGE													
BEGINNING STORAGE (gal)	5,800,000	9,079,312	18,136,083	40,804,324	62,641,611	57,733,484	41,522,884	31,387,854	15,667,005	7,961,321	2,133,178	1,305,365	
CALCULATED STORAGE GAIN (gal)	3,279,312	9,056,771	22,668,241	21,837,287	10,914,721	13,650,410	19,546,970	1,141,151	-7,705,685	-5,828,142	-827,814	153,424	
PROJECTED ESTIMATED STORAGE (gal)	9,079,312	18,136,083	40,804,324	62,641,611	73,556,332	71,383,894	61,069,854	32,529,005	7,961,321	2,133,178	1,305,365	1,458,788	=CARRYOVER
AMOUNT DISCHARGED TO BLOODS CREEK (gal)	0	0	0	0	15,822,848	29,861,010	29,682,000	16,862,000	0	0	0	0	92,227,858
ESTIMATED STORAGE (gal)	9,079,312	18,136,083	40,804,324	62,641,611	57,733,484	41,522,884	31,387,854	15,667,005	7,961,321	2,133,178	1,305,365	1,458,788	
ACTUAL STORAGE (gal)	6,700,000	17,830,000	41,740,000	64,200,000	56,340,000	39,880,000	27,490,000	13,250,000	6,850,000	1,790,000	0	980,000	

MAXIMUM STORAGE (MG) 62.64

AVAILABLE STORAGE (MG) 76.43

SUMMARY

ANNUAL INFLOW (MG)	
WASTEWATER	36.25
PRECIPITATION	55.98
SNOW INFLUX (MG)	30.68
TOTAL	122.91

ANNUAL OUTFLOW POTENTIAL (MG)	
AMOUNT DISCHARGED TO BLOODS CREEK	92.23
EVAPORATION	10.58
PERCOLATION	8.39
IRRIGATION	16.05
TOTAL	127.25

OVERALL BALANCE	
UNUSED DISPOSAL CAPACITY (MG) (MUST NOT BE NEGATIVE)	-1.46
UNUSED STORAGE CAPACITY (MG) (MUST NOT BE NEGATIVE)	13.79

(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

TABLE 7

BEAR VALLEY WATER DISTRICT WASTEWATER TREATMENT AND DISPOSAL SYSTEM 6/8/2020 9:26

(2020 update) 2016/2017 water year: 1 in 100 Year Water Balance Projection - 2000 thru 2019 90TH Percentile monthly ADF

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	
90TH PERCENTILE EXISTING FLOWS (Avg. GAL/D)	37135	77828	98766	131156	125459	186046	188872	127254	73229	61715	38479	31386	

CALCULATIONS

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
WASTEWATER VOLUME (gal)	1,114,050	2,412,668	3,061,746	3,672,368	3,889,229	5,581,380	5,855,032	3,817,620	2,270,099	1,913,165	1,154,370	972,966	35,714,693
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	7.76	9.10	10.93	12.34	12.08	11.08	10.50	9.09	2.76	2.64	2.57	
EVAP. VOLUME (gal)	84,162	84,320	123,611	148,393	435,664	721,775	1,293,979	1,511,261	1,504,881	412,533	293,500	132,594	6,746,672
PRECIP. VOLUME (gal)	1,496,647	4,039,668	14,779,755	10,941,027	2,795,985	4,529,604	533,927	924,078	0	0	0	0	40,040,690
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	5,390,114	14,656,145	12,546,237	6,760,272	9,419,361	14,878,904	(587,183)	(1,504,881)	(412,533)	(293,500)	(132,594)	63,248,756
IRRIGATION													
IRRIGATION DISPOSAL (gal)$_{(f)}$	0	0	0	0	0	0	0	0	14,950,000	1,010,000	376,000	506,500	16,842,500
STORAGE													
BEGINNING STORAGE (gal)	4,060,000	7,276,341	15,351,197	34,680,588	52,192,392	48,856,553	36,500,069	29,644,089	15,159,962	165,459	56,619	0	
CALCULATED STORAGE GAIN (gal)	3,216,341	8,074,856	19,329,390	17,511,804	10,588,129	13,920,940	19,263,762	1,615,873	-14,994,503	-108,841	-59,109	-49,613	
PROJECTED ESTIMATED STORAGE (gal)	7,276,341	15,351,197	34,680,588	52,192,392	62,780,521	62,777,493	55,763,831	31,259,962	165,459	56,619	0	0	
AMOUNT DISCHARGED TO BLOODS CREEK (gal)	0	0	0	0	13,923,968	26,277,424	26,119,742	16,100,000	0	0	0	0	82,421,134
ESTIMATED STORAGE (gal)	7,276,341	15,351,197	34,680,588	52,192,392	48,856,553	36,500,069	29,644,089	15,159,962	165,459	56,619	0	0	

MAXIMUM STORAGE (MG) 52.19
AVAILABLE STORAGE (MG) 76.43

SUMMARY

ANNUAL INFLOW (MG)		ANNUAL OUTFLOW POTENTIAL (MG)		OVERALL BALANCE	
WASTEWATER	35.71	AMOUNT DISCHARGED TO BLOODS CREEK	82.42	UNUSED DISPOSAL CAPACITY (MG) (MUST NOT BE NEGATIVE)	0.05
PRECIPITATION	47.19	EVAPORATION	9.31		
SNOW INFLUX (MG)	29.95	PERCOLATION	8.39	UNUSED STORAGE CAPACITY (MG) (MUST NOT BE NEGATIVE)	24.24
TOTAL	112.86	IRRIGATION	16.84		
		TOTAL	116.97		

(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

TABLE 8

BEAR VALLEY WATER DISTRICT WASTEWATER TREATMENT AND DISPOSAL SYSTEM 6/8/2020 9:26

(2020 update- 2010/2011 Precip. Pattern) 1 in 100 Year Water Balance Projection - 2000 thru 2019 90TH Percentile monthly ADF plus 1196 EDU (201 gpd/EDU) - Assumes no infiltratin with new EDUs

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	18.27	1.30	2.37	0.00	0.00	0.00	0.00	1.53	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)	37,135	77,828	98,766	131,156	125,459	186,046	188,872	127,254	73,229	61,715	38,479	31,386	
TOTAL INFLUENT FLOW (GAL/D)	277,531	318,224	339,162	371,552	365,855	426,442	429,268	367,650	313,625	302,111	278,875	271,782	

CALCULATIONS

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
WASTEWATER VOLUME (gal)	8,325,930	9,864,944	10,514,022	10,403,456	11,341,505	12,793,260	13,307,308	11,029,500	9,722,375	9,365,441	8,366,250	8,425,242	123,459,233
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	9.38	11.22	11.76	12.28	12.56	11.13	10.91	10.36	10.13	8.53	3.36	
EVAP. VOLUME (gal)	84,162	101,860	152,374	159,611	433,572	750,075	1,299,758	1,570,694	1,716,787	1,513,309	949,396	173,416	8,905,014
PRECIP. VOLUME (gal)	5,032,887	9,615,218	1,379,589	5,174,256	10,466,832	1,649,245	2,257,681	761,343	802,510	0	889,921	2,020,240	40,049,722
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	9,513,358	1,227,215	5,014,645	10,033,260	899,170	13,855,650	7,888,429	(914,277)	(1,513,309)	(59,476)	2,812,946	53,706,336
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	17,553,265	38,195,271	44,742,097	51,425,613	54,990,448	37,094,350	34,492,715	28,066,813	25,412,082	10,303,741	705,643	
CALCULATED STORAGE GAIN (gal)	13,493,265	20,642,007	10,946,826	15,683,516	22,664,835	12,103,902	25,998,365	17,274,097	-2,654,731	-15,108,340	-9,598,098	-769,852	
PROJECTED ESTIMATED STORAGE (gal)	17,553,265	38,195,271	49,142,097	60,425,613	74,090,448	67,094,350	63,092,715	51,766,813	25,412,082	10,303,741	705,643	0	
AMOUNT DISCHARGED TO BLOODS CREEK (gal)	0	0	4,400,000	9,000,000	19,100,000	30,000,000	28,600,000	23,700,000	0	0	0	0	114,800,000
ESTIMATED STORAGE (gal)	17,553,265	38,195,271	44,742,097	51,425,613	54,990,448	37,094,350	34,492,715	28,066,813	25,412,082	10,303,741	705,643	0	

MAXIMUM STORAGE (MG) 54.99
AVAILABLE STORAGE (MG) 76.43

SUMMARY

ANNUAL INFLOW (MG)	
WASTEWATER	123.46
PRECIPITATION	47.19
SNOW INFLUX (MG)	22.56
TOTAL	193.22

ANNUAL OUTFLOW POTENTIAL (MG)	
AMOUNT DISCHARGED TO BLOODS CREEK	114.80
EVAPORATION	11.47
PERCOLATION	8.39
IRRIGATION	62.68
TOTAL	197.34

OVERALL BALANCE	
UNUSED DISPOSAL CAPACITY (MG) (MUST NOT BE NEGATIVE)	0.06
UNUSED STORAGE CAPACITY (MG) (MUST NOT BE NEGATIVE)	21.44

(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

TABLE 9

BEAR VALLEY WATER DISTRICT WASTEWATER TREATMENT AND DISPOSAL SYSTEM 6/8/2020 9:26

(2020 update - 2016-2017 Precip. Pattern) 1 in 100 Year Water Balance Projection - 2000 thru 2019 90TH Percentile monthly ADF plus 1196 EDU (201 gpd/EDU) - Assumes no infiltratin with new EDUs

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)	2.93	7.84	28.46	21.98	5.29	8.57	1.01	1.76	0.31	1.67	2.76	0.42	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)	0.81	1.04	0.00	1.27	8.11	10.19	37.88	0.00	0.00	0.00	0.00	0.70	60.00
ESTIMATED NEW SNOW IN MONTH (IN Water)	2.88	3.11	21.41	15.64	5.21	8.54	0.00	0.00	0.00	0.00	0.00	3.21	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)	37,135	77,828	98,766	131,156	125,459	186,046	188,872	127,254	73,229	61,715	38,479	31,386	
TOTAL INFLUENT FLOW (GAL/D)	277,531	318,224	339,162	371,552	365,855	426,442	429,268	367,650	313,625	302,111	278,875	271,782	

CALCULATIONS

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
WASTEWATER VOLUME (gal)	8,325,930	9,864,944	10,514,022	10,403,456	11,341,505	12,793,260	13,307,308	11,029,500	9,722,375	9,365,441	8,366,250	8,425,242	123,459,233
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)	2.93	7.84	28.46	21.98	5.29	8.57	1.01	1.76	0.31	1.67	2.76	0.42	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)	252,212	674,860	2,449,811	1,892,018	455,358	737,698	86,940	151,499	26,685	143,752	237,578	36,153	7,144,564
TREATMENT DISPOSAL(GAIN)/ (gal)	(446,782)	216,983	1,410,935	1,243,273	(98,386)	(1,140,917)	(1,477,921)	(1,627,476)	(783,036)	(455,721)	(306,401)	(347,331)	(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	9.01	10.49	12.22	13.34	13.11	12.41	12.23	10.59	10.29	8.88	6.10	
EVAP. VOLUME (gal)	84,162	97,827	142,398	165,937	470,867	783,345	1,448,972	1,760,416	1,754,119	1,536,916	988,934	314,810	9,548,703
PRECIP. VOLUME (gal)	1,383,336	3,761,261	13,768,250	10,736,865	2,600,122	4,207,034	493,883	859,780	150,056	807,011	1,323,189	198,183	40,288,970
MONTHLY AVAIL. SNOWMELT (IN)(c)	0.81	1.04	0.00	1.27	8.11	10.19	37.88	0.00	0.00	0.00	0.00	0.70	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)	1,099,749	1,412,023	0	1,724,297	4,404,425	5,534,043	15,429,065	0	0	0	0	0	29,603,603
RESERVOIR DISPOSAL(GAIN) (gal)	2,398,923	5,075,457	13,625,852	12,295,225	6,533,680	8,957,733	14,473,976	(900,636)	(1,604,063)	(729,905)	334,255	(116,627)	60,343,870
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	14,338,071	29,495,455	50,646,264	65,588,219	62,465,019	53,075,095	50,778,458	30,679,846	27,219,122	13,037,937	3,911,041	
CALCULATED STORAGE GAIN (gal)	10,278,071	15,157,384	25,550,810	23,941,954	17,776,800	20,610,076	26,303,363	8,501,388	-3,460,724	-14,181,185	-9,126,896	-4,037,716	
PROJECTED ESTIMATED STORAGE (gal)	14,338,071	29,495,455	55,046,264	74,588,219	83,365,019	83,075,095	79,378,458	59,279,846	27,219,122	13,037,937	3,911,041	0	
AMOUNT DISCHARGED TO BLOODS CREEK (gal)	0	0	4,400,000	9,000,000	20,900,000	30,000,000	28,600,000	28,600,000	0	0	0	0	121,500,000
ESTIMATED STORAGE (gal)	14,338,071	29,495,455	50,646,264	65,588,219	62,465,019	53,075,095	50,778,458	30,679,846	27,219,122	13,037,937	3,911,041	0	

MAXIMUM STORAGE (MG) 65.59
AVAILABLE STORAGE (MG) 76.43

SUMMARY

ANNUAL INFLOW (MG)		ANNUAL OUTFLOW POTENTIAL (MG)		OVERALL BALANCE	
WASTEWATER	123.46	AMOUNT DISCHARGED TO BLOODS CREEK	121.50	UNUSED DISPOSAL CAPACITY (MG) (MUST NOT BE NEGATIVE)	0.13
PRECIPITATION	47.43	EVAPORATION	12.12		
SNOW INFLUX (MG)	29.60	PERCOLATION	8.39	UNUSED STORAGE CAPACITY (MG) (MUST NOT BE NEGATIVE)	10.84
TOTAL	200.50	IRRIGATION	62.68		
		TOTAL	204.68		

(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