BEAR VALLEY WATER DISTRICT
2019 ANNUAL OPERATIONS REPORT

Order # R5-2019-0078

January 30, 2020

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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. R5-2019-0078.

1.2 Background

During the 2019 water year (October 2018 to September 2019), an annual daily average flow of approximately 0.069 million gallons per day (MGD) (approximately 25.20 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 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 2019 land disposal season, initiated July 12, 2019, the District had approximately 26.07 MG of effluent in storage and spray field areas 1 through 9 (32.90 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 32.90 acre spray field area during the peak disposal months of 2019 ranged from approximately 5.548 – 8.188 MG per month (0.169 MG – 0.249 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. R5-2019-0078 (adopted as amended 20 December 2019), 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. R5-2019-0078, the District discharged effluent to Bloods Creek during the months of May and June 2019.

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 October 15, 2019, the Central Valley Water Board staff reviewed the electronic self-monitoring reports (eSMRs) for the surface water discharge permitted by the Discharger for the May 2019 and June 2019 monitoring periods. Central Valley Board staff identified that the Discharger violated both effluent limitations and Monitoring and Reporting Limitations in June 2019. On (3) separate discharge dates, including June 22, June 26, and June 27, the discharger violated effluent limitation for total coliform exceeding the WDR limit of 23 MPN/100 ml on each discharge date.

Additionally, MRP provision IV.A of the WDR's requires the Discharger to report the continuous flow and dilution ratio available. Due to a reporting error, the Discharger reported the flows for June 29, 2019 twice but failed to report the flow for June 30, 2019 thereby violating this provision of the MRP.

In response to the effluent limitation violations for total coliform, in its June 2019 eSMR submission, the District notified Central Valley Board staff of the corrective actions taken to avoid this violation in the future which included cleaning of all filters and injection points and dramatically increasing the dosing of chlorine disinfection during transfer.

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 April 30, 2019 prior to initiating discharge to Bloods Creek on May 1, 2019, 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

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

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

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

Steven Schnitter 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 2019:

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
GLI pH Analyzer	Quarterly by Staff December 2019
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 2019
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	Quarterly by Staff – When Discharging May 2019
ATI Chlorine Residual Analyzer Surface Water Discharge	Monthly by Staff – When Discharging May 2019
ATI Sulfite Residual Analyzer Surface Water Discharge	Monthly by Staff – When Discharging May 2019
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 November 2019

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 2019 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 2019.

SECTION 7 – VIOLATIONS AND CORRECTIVE ACTIONS

7.1 Notices of Violation

On October 15, 2019, the Central Valley Water Board staff reviewed the electronic self-monitoring reports (eSMRs) for the surface water discharge permitted by the Discharger for the May 2019 and June 2019 monitoring periods. Central Valley Board staff identified that the Discharger violated both effluent limitations and Monitoring and Reporting Limitations In June 2019. On (3) separate discharge dates, including June 22, June 26, and June 27, the discharger violated effluent limitation for total coliform exceeding the WDR limit of 23 MPN/100 ml on each discharge date.

Additionally, MRP provision IV.A of the WDR's requires the Discharger to report the continuous flow and dilution ratio available. Due to a reporting error, the Discharger reported the flows for June 29, 2019 twice but failed to report the flow for June 30, 2019 thereby violating this provision of the MRP.

7.2 Corrective Actions

In response to the effluent limitation violations for total coliform, in its June 2019 eSMR submission, the District notified Central Valley Board staff of the corrective actions taken to avoid this violation in the future which included cleaning of all filters and injection points and dramatically increasing the dosing of chlorine disinfection during transfer.

In response to the violation of MRP provision IV.A of the WDR's related to reporting of continuous flow and dilution ratio, following receipt of the October 15, 2019 notice of violation letter, District staff requested release of the June 2019 electronic self-monitoring reports (eSMRs) from enforcement staff at the Central Valley Water Board for amendment. Enforcement staff released the eSMR and District staff resubmitted the corrected June 20189 eSMR on October 30, 2019.

7.3 Technical Reports

The District completed and submitted the following technical and other documents as required by the NPDES Permit during 2019:

1. 2018 Annual Operations Report submitted – Submitted January 24, 2019
2. 2019 First Tri-Annual Groundwater Monitoring Report - Submitted August 19, 2019
3. 2019 Second Tri-Annual Groundwater Monitoring Report - Submitted September 23, 2019
4. 2019 Third Tri-Annual Groundwater Monitoring Report - Submitted November 19, 2019

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 measurement on October 24, 2019 revealed that the sludge depth ranged from approximately 6" to as much as 34". According to the solids distribution in the lagoon, there is additional accumulation at the inlet, in the far ends and corners and half way back on the outlet side. This solids distribution pattern is reasonable based on the location of the inlet and outlet structures and the increases correspond roughly to the same areas where the original diffusers have become either clogged or inoperable.

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 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 which is expected to produce improved effluent quality, reduce overall sludge and improve energy efficiency.

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. Meanwhile, annual organic solids removal at all four (4) District lift stations is routinely performed and was completed this year by El Dorado Septic on October 17, 2019.

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Appendix A. 2019 Water Balance - Prepared January 30, 2019

APPENDIX A. 2019 WATER BALANCE