U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION VIII WATER BRANCH, ENFORCEMENT
AND COMPLIANCE ASSURANCE DIVISION
CLEAN WATER ACT
COMPLIANCE INSPECTION REPORT

for

Name of Facility: Town of Milliken Reverse Osmosis Water Treatment Plant
Facility Address: 400 Inez Blvd., Milliken, CO 80543
Mailing Address: 400 Inez Blvd., Milliken, CO 80543

Report Prepared on: 7/28/2022 By: (b) (6)
Date
Danny O'Connell, Environmental Scientist (PG Environmental)
Signature

Report Final as of: 8/24/2022 By: _____, EPA
Date *Signature*
Michael Boeglin, Supervisor, EPA Region 8

General Information

Type of Inspection: Reverse Osmosis Water Treatment Plant CEI
Owner: Town of Milliken (Public)
Operator: Town of Milliken Public Works
Permittee: Milliken Reverse Osmosis Water Treatment Plant
CDPS Permit No: CO0046485
CDPS Permit Effective Date: Issued November 23, 2015, became effective January 1, 2016. Modified September 30, 2020, modified Permit became effective November 1, 2020
CDPS Permit Expiration Date: December 31, 2020 (administratively extended)
Number of Outfalls: 1 (Outfall 001A): 40.319° N, 104.864° W (At the Facility, also known as sampling Port 104)
Receiving Water: Little Thompson River
Latitude and Longitude: 40.32143° N 104.86779° W (Discharge point to the river)

On-Site Facility Inspection Overview

Inspection Date: June 21, 2022
Approximate Entry Time: 9:00 a.m. (MDT)
Approximate Exit Time: 1:00 p.m. (MDT)

On June 21, 2022, a representative from U.S. Environmental Protection Agency (EPA) Region VIII, the Colorado Department of Public Health and Environment (CDPHE), and EPA's contract inspectors from PG Environmental (the EPA Inspection Team), conducted a compliance evaluation inspection of wastewater discharges from the Milliken Reverse Osmosis Water Treatment Plant (ROWTP) in Milliken, Colorado. The Town of Milliken Public Works is identified as the Permittee and owns and operates the Facility. The ROWTP was completely offline at the time of inspection.

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I. INTRODUCTION

On June 21, 2022, a representative from U.S. Environmental Protection Agency (EPA) Region VIII, the Colorado Department of Public Health and Environment (CDPHE), and EPA's contract inspectors from PG Environmental (hereinafter, collectively referred to as the EPA Inspection Team) inspected the Milliken Reverse Osmosis Water Treatment Plant (ROWTP) (hereinafter, Facility) in Milliken, Colorado. The Town of Milliken Public Works, (hereinafter, Permittee) is identified as the Permittee and owns and operates the Facility. The primary purpose of the inspection was to review and evaluate Facility operations and wastewater management, to review the accuracy and reliability of the Permittee's self-monitoring and reporting program, and to obtain information that will assist EPA in assessing the Permittee's compliance with the requirements of the Permit. The weather at the time of the inspection was breezy, warm, and sunny. The Facility was completely offline at the time of the inspection.

The Facility is authorized to discharge process wastewater to the Little Thompson River (40.319° N, 104.864° W) consistent with the terms and conditions of Colorado Discharge Permit System (CDPS) Permit No. CO0046485 (hereinafter, the Permit). The Permit was issued on November 23, 2015 and became effective January 1, 2016. The Permit was modified September 30, 2020, and the modified Permit became effective November 1, 2020. The Permit expired on December 31st, 2020 but has been administratively extended.

Photographs taken during the inspection are maintained on file with EPA Region VIII, some of which are included in this report as Appendix A, Photograph Log. Supporting documentation is included in Appendix B, Exhibit Log. A copy of the Permit is included as Appendix C.

Facility Description

The Facility uses Reverse Osmosis (RO) and carbon media bioreactor technology to treat groundwater that is pumped from two groundwater wells into the treatment system. The treated water is ultimately used as a drinking water source for the Town of Milliken and based on projected future demand projections, it is a critical source of water for the community. The Facility is located on the corner of County Road 21 and County Road 36 in Milliken, Colorado within Weld County. The drinking water aspect of the Facility is not covered under the CDPS Permit No. CO0046485 discussed in this report, but the process waste streams generated from the drinking water production are.

Prior to 2014, the Facility was using only RO technology to treat groundwater. The Facility discharged its RO generated waste concentrate from the drinking water treatment process without further treatment. In response to a CDPHE Notice of Violation and Cease and Desist Order (numbers DO-140507-1 and IO-140507-1, dated May 7, 2014) based on numerous selenium violations, additional technologies were brought in to try to reduce selenium concentrations in the waste streams produced from the RO treated groundwater processes. The Facility was shut down in 2014, and during the shutdown a pilot version of Frontier's SeHAWK bioreactor was brought into the Facility for testing. Facility representatives stated that the pilot version of the SeHAWK reduced selenium during the pilot study, so a full version of the bioreactor was brought online at the Facility in September 2019. Technical information about the SeHAWK can be found on Frontier's website using the following web link: https://frontierwater.com/sehawk-process/.

Since the new bioreactor was placed into operation at the Facility in September 2019, it experienced structural challenges and failures which were tracked in the internal SeHAWK bioreactor maintenance log (refer to Appendix B, Exhibit 1). In June 2020, the bioreactor was taken offline due to a leak in the side of the tank. Operators stated that water was observed spraying out of the side of the tank, and it was shut down immediately. Also at this time, the underdrain of the tank was experiencing structural failures. Once repairs were made to the system, the bioreactor went back online in September 2020, before ultimately experiencing a gasket/seal failure which caused carbon to leak into the rest of the treatment system in

January 2021. The seals were replaced, but in October 2021 the bioreactor was shut down again because one of the underdrain plates experienced a structural failure. The seal between the metal drain plates and the bottom of the bioreactor failed during operation. This caused carbon to leak through bolt holes and get into the improper treatment units. The bioreactor has been shut down since the October 2021 failure, and new underdrain plates were being installed at the time of the inspection.

The Facility's raw water source, two groundwater wells, are approximately 50 feet deep, and are positioned close together. The well's production rate and water quality can vary during normal operation. This is due to a varying recharge rate that at times is not high enough to maintain constant flow through the treatment process. Facility representatives speculate that this is one of the primary reasons that the bioreactor failed initially a few months after it was installed and continued to fail several times before being taken offline again in October 2021.

The waste stream generated from the RO process consists of concentrate and various permeate flows. The waste stream from the RO process contributes approximately 0.14 MGD to the overall wastewater at the Facility, and the bioreactor generates approximately 0.17 MGD. Combined, the Facility is capable of producing 0.31 MGD of discharge. This is reflected in the Permittee's September 2020 Permit modification request to CDPHE in which the Facility successfully requested that their permitted flow be reduced from the Facility's designed capacity of 0.70 MGD to 0.31 MGD. The treated waste stream is monitored immediately downstream of the Facility's Reaction/Aeration tank. This location is identified as sampling Port 104 internally at the Facility, but also represents permitted Outfall 001A. Treated effluent is then gravity fed into a sump tank, where it is ultimately pumped to the Little Thompson River. The effluent is transported to the Little Thompson River by the town's stormwater line, which runs along the west side of South Quentine Avenue. It reaches the surface at a stormwater collector apron, where it comingles with stormwater before flowing to its final discharge point at the Little Thompson River. Solid waste generated at the Facility is removed for proper disposal by McDonald Farms Enterprises.

Wastewater Generation and Treatment

Wastewater streams (concentrate and maintenance streams) are generated at this Facility through Reverse Osmosis treatment during the process of generating drinking water for the Town of Milliken. At the start of the process, groundwater is drawn from two, approximately 50-foot-deep wells and blended. It is then sent through the one functional RO system, consisting of six individual units, for initial treatment. After RO treatment, brine concentrate and percentage of permeate are fed into an equalization tank. Some permeate from the RO process is sent to two, 1,100-gallon onsite holding tanks, where it is stored for future use during clean in place (CIP) operations. During periods of peak flow, such as summer, the Facility is able to completely fill the equalization tank before it is sent through the treatment system. During periods of lower flow like winter, according to Facility representatives the Facility is not able to generate a continuous stream of wastewater for the proper operation of the waste treatment system.

Brine concentrate and a portion of the permeate are then pumped through the SeHAWK bioreactor via two Bio Feed pumps. The initial stage (Stage 1) of treatment in the bioreactor consists of upward flow through the 1A and 1B units. Facility representatives stated that at their current influent rate of 0.31 MGD, only Stage 1A was needed for proper treatment. During Stage 1, nutrients are fed into the bioreactor which helps facilitate the biological transformation of nitrate into nitrogen gas, which is then released from the system. In the second stage (Stage 2), the effluent flows back downward through the 2A and 2B units. Stage 2 is where biofiltration occurs in the system, removing selenium and other heavy metals. When the bioreactor is in a backwash cycle, waste from the backwash process is sent to the Waste Sump Tank outside of the bioreactor building, where solids settling occurs. The supernatant water at this stage is pumped out of the tank through an automatic strainer before going through a multimedia filter and a granular activated carbon (GAC) tank. An odor scrubber is also present at this stage of the treatment process. The water is then redirected back to the equalization tank before being reintroduced into the system. Solids that settle in the Waste Sump Tank are taken by McDonald Farms Enterprises to be properly disposed of. Before the waste

stream enters the bioreactor, there is a bypass option which can be used to route the RO waste directly to the Waste Sump Tank, where it is ultimately pumped to the Little Thompson River. Operators stated that they use this bypass in the event of a bioreactor shut down when the RO units are still in operation.

After the effluent goes through both stages of the bioreactor, it is pumped to a Backwash Supply Tank. The water used during bioreactor backwash cycles is stored in this tank. The Backwash Supply Tank is designed to overflow to the bottom of the Reaction Tank, where hydrogen peroxide is injected for the aeration treatment phase. A blower injects air into the Reaction Tank through a series of diffusers at the bottom of the tank. The final effluent sampling takes place before the effluent is discharged from the Facility and into the Town of Milliken's stormwater system. Oxidation-reduction potential (ORP), pH, and Dissolved Oxygen (DO) are measured at this location. As final effluent is transported to the Little Thompson River, it emerges from a PVC pipe into a stormwater culvert collector apron, which is located on the corner of South Quentine Avenue and West Lilac Street, approximately half a mile from the Facility. Operators indicated that this was the last place that the water was uninfluenced by any other source such as stormwater flow from the Town of Milliken before discharging into the Little Thompson River. After this point, the water continues to flow by gravity in the stormwater system about half a mile further north before final discharge into the Little Thompson River.

Wastewater Monitoring and Flow

During periods of normal operation, CDPS compliance self-monitoring activities and samples are conducted by Milliken ROWTP staff before final effluent leaves the Facility. Compliance sampling takes place after the water leaves the Reaction/Aeration Tank via sampling Port 104 (Outfall 001A), before it is sent to the Little Thompson River through the same manhole that the Facility was pumping untreated well water through on the day of the inspection. Grab samples are collected from one end of Port 104, which is a T-off pipe. On the other end of the pipe, composite samples are taken by a Hach AS950 automatic sampler. Composite samples are flow weighted. Process control samples are also collected by Facility operators. The onsite sample collection location and methods appeared to provide representative samples. The samples are analyzed using both on-site and contract laboratories. Measurements for DO, pH, temperature, conductivity, and ORP are conducted onsite, while weekly analysis for E-Coli and Total Suspended Solids (TSS), monthly analysis for Arsenic (total and potentially dissolved), Bicarbonate, Boron (total), Cadmium (total and potentially dissolved), Calcium (total), Chloride, Chromium Trivalent (total and potentially dissolved), Chromium Hexavalent (dissolved), electrical conductivity, Iron (total and dissolved), Copper (potentially dissolved), Lead (total and potentially dissolved), Manganese (total and potentially dissolved), Magnesium (total), Mercury (total low level), Molybdenum (total), Nickel (total and potentially dissolved), Nitrogen (total inorganic), Selenium (potentially dissolved), Silver (potentially dissolved), Uranium (total), Zinc (potentially dissolved), SAR, Sodium (total), Sulfate, Sulfide, and quarterly analysis for Total Dissolved Solids (TDS), and Total Ammonia, are conducted by Colorado Analytical Laboratories, Inc., the Facility's contract laboratory in Commerce City, Colorado.

Whole effluent toxicity (WET) testing is conducted by another contract laboratory, SeaCrest Group in Louisville, Colorado. Facility discharge monitoring reports (DMRs) for 2019 through 2021 were reviewed as a component of this inspection. Since the Facility has been offline since October 2021, DMRs from 2022 were not reviewed. The review included a comparison of reported monitoring results versus requirements and limitations contained within the Permit. Permit limit exceedances were identified and are presented in Section III, Observation No. 1 of this report for additional details.

Wastewater Solids Handling

Solids generated from the ROWTP are sent to McDonald Farms Enterprises for proper disposal.

WWTP Operation and Maintenance Management

The Permittee currently does not utilize a Computerized Maintenance Management (CMMS) software to track work orders, labor hours, or assets at the Facility. However, the Water/Wastewater Director of the Facility tracks repairs/maintenance in a Microsoft Excel Spreadsheet. The EPA Inspection Team reviewed this spreadsheet as a component of the inspection (refer to Appendix B, Exhibit 1).

II. INSPECTION PROCESS

Inspection Opening Conference

The EPA Inspection Team arrived at the Facility on June 21, 2022, at 9:00 a.m. (MDT) for the inspection. Danny O'Connell of PG Environmental, and Stephanie Meyers of EPA Region VIII displayed their Clean Water Act inspector credentials to Don Stonebrink, the Water/Wastewater Director at the outset of the inspection and explained the purpose of the inspection was to confirm compliance with the Facility's CDPS Permit No. CO0046485 (refer to Appendix C). The EPA Inspection Team informed the Permittee that any information that the Facility deemed to be confidential business information ("CBI") should be identified to EPA representatives during the inspection and it would be handled as CBI according to EPA's CBI procedures. No information provided to the EPA Inspection Team was identified as CBI during the course of the inspection. The list below describes the individuals that participated in the inspection.

Inspection Attendee List:

EPA Inspectors and Contractors:
Stephanie Meyers, US EPA Region 8
Danny O'Connell, PG Environmental (EPA Contractor)
Jake Okun, PG Environmental (EPA Contractor)

Colorado Department of Public Health (CDPHE) Representatives:
Emma Ely, CDPHE

Town of Milliken ROWTP Representatives:
Don Stonebrink, Town of Milliken
Kyle Beyerlein, Town of Milliken

Facility Site Walk

As part of the inspection process, the EPA Inspection Team visually observed the treatment train and site conditions in the presence of the Water/Wastewater Director and the lead Facility operator. The Facility was completely offline at the time of inspection, but components of the treatment process were still observed. The wastewater process train consists of:

- RO Membrane System #1 (out of service since the plant was initially brought online)
- RO Membrane System #2
- Equalization Tank
- Bio Feed Pumps (2)
- SeHAWK Bioreactor
- Nutrient Storage Tank and Nutrient Feed
- Multimedia and GAC Filtration Tanks
- Sump Waste Tank and Sump Pumps
- Treated Water Pumps (2)
- Backwash Supply Tank

- Reaction/Aeration Tank
- Backwash Pumps (2)
- Blower

Additional equipment and assets that were observed that support the wastewater treatment process include:

- pH, ORP, DO, and Conductivity Meters
- Two, 1,100-gallon RO Permeate Storage Tanks
- H_2S Sensor
- Odor Scrubber
- Hydrogen Peroxide Storage
- Automatic Hach Effluent Sampler

The Facility site walk began at approximately 11:00 a.m. MDT on June 21, 2022. The walk began in the RO building, where the EPA Inspection Team observed the two RO systems (refer to Appendix A, Photographs 1-2). While the plant was in operation, only RO System #2 had been used due to repeated technical failures with RO System #1 since it was originally installed. The membranes from RO System #1 were not in place at the time of inspection, and an operator log indicated that the membranes had been sold in May 2022 (refer to Appendix A, Photograph 1). The EPA Inspection Team also observed the initial filtration units where RO feed passed through before entering the systems (refer to Appendix A, Photograph 3). Next, Facility representatives showed the two, 1,100-gallon RO permeate storage tanks outside of the RO building (refer to Appendix A, Photograph 4). They stated that the RO permeate was stored here and used for RO membrane CIP and rinses. Waste from the CIP process is drained directly to the sewer system.

Concentrate from the RO process is pumped to the equalization tank (refer to Appendix A, Photograph 5). The equalization tank had 16 operational feet, and the tank had approximately eight feet of water in it at the time of the inspection, leaving approximately 50% of the operational volume available. After observing the equalization tank, the EPA Inspection Team observed the two bio feed pumps which pump water from the equalization tank to the SeHAWK bioreactor (refer to Appendix A, Photograph 6). Operators stated that pH and conductivity internal process sampling occur at this location. As water is fed into the bioreactor at this stage, it is injected with a nutrient blend to assist with nitrification. Nutrients, which the operators stated were a proprietary blend, are stored adjacent to the bioreactor in a nutrient storage tank (refer to Appendix A, Photograph 7). Operators stated that the centrifugal nutrient feed pumps had experienced challenges while the bioreactor was in operation, and they had to be modified by the operations team. The nutrient feed pumps were originally fastened to the side of the reactor with adhesive, and this resulted in the nutrient feed pumps not pumping the nutrient blend in the proper amounts. Operators had to unfasten the nutrient feed pumps in order for the system to function properly (refer to Appendix A, Photograph 8).

At the time of inspection, new iron plates were being installed in the SeHAWK bioreactor, and the EPA Inspection Team observed the new plates staged next to the bioreactor (refer to Appendix A, Photograph 9). An operator stated that these new plates, along with new seals and gaskets were the latest solution to the repeated structural failures that the bioreactor had experienced since it was brought online in September 2019. Since the bioreactor was being repaired during the inspection, the EPA Inspection Team was able to look at the inner structure of the tank. The bottom plates of the tank were pitted and heavily marked with deep grooves and scratches in the metal (refer to Appendix A, Photograph 10). An operator stated that these marks were a result of normal operation on the system. Facility representatives indicated that once the bioreactor was repaired, only Stage 1A would be used for the initial treatment step. Rather than sending flow through both Stages 1A and 1B before entering Stage 2 treatment, this capacity reduction would help deal with low or variable groundwater flow through the system. According to Facility representatives, it would also allow for Stage 1B to be used for spare parts if needed.

After observing the SeHAWK bioreactor (refer to Appendix A, Photograph 11), the EPA Inspection Team observed a bypass valve which allows water to be sent directly to the Waste Sump Tank located outside of the bioreactor building rather than being treated in the bioreactor (refer to Appendix A, Photographs 12-13). This allows operators to send water directly to the Waste Sump Tank, where it is ultimately pumped to the Little Thompson River, when the bioreactor is offline or under repair. While the bioreactor is operating, water is pumped from the bioreactor and sent to this tank for solids settling during routine backwash cycles. An operator stated that the solids are taken by McDonald Farms Enterprises for proper offsite disposal. They then stated that the supernatant water in this Waste Sump Tank is pumped through an automatic strainer before going through multimedia and GAC filtration (refer to Appendix A, Photograph 14). During the inspection, the EPA Inspection Team observed filter media on the floor around the filtration tanks and Facility representatives stated that they had just recently switched out the filter media. After filtration, the backwash water is then sent back to the equalization tank to be reintroduced to the system.

Once water is treated in the bioreactor, water is pumped to the Backwash Supply Tank via two treated water pumps (refer to Appendix A, Photographs 15). The operator said that backwash water was stored in this tank, and that two backwash pumps sent it back through the bioreactor during backwash cycles. When the bioreactor is not backwashing, water flows from the top of the backwash tank downward into the Reaction/Aeration Tank (refer to Appendix A, Photograph 16). Facility representatives showed where hydrogen peroxide is stored/pumped from (refer to Appendix A, Photograph 17), and injected before entering the Reaction/Aeration Tank (refer to Appendix A, Photograph 18). The EPA Inspection Team observed where air from the blowers is injected into the bottom of the Reaction/Aeration Tank (refer to Appendix A, Photograph 19). Once final effluent leaves the Reaction/Aeration Tank, an operator stated that it was sampled for DO, ORP, pH, and conductivity. They showed the EPA Inspection Team the instrumentation panel containing all of the probes for sampling these parameters (refer to Appendix A, Photograph 20), as well as the sampling port where compliance grab sampling for these parameters is conducted for the final treated effluent. The operators internally referred to this as sampling Port 104 (refer to Appendix A, Photograph 21). Facility representatives stated that Port 104 was the same as permitted Outfall 001A, and it was located inside the bioreactor building just off of the Reaction/Aeration Tank. In addition to the grab sample location, Facility representatives showed their Hach AS950 automatic sampler, which is used to take composite compliance samples for Outfall 001A (refer to Appendix A, Photograph 22). Final effluent is then gravity fed into a sump tank, before being pumped toward the Little Thompson River. The EPA Inspection Team observed a manhole outside of the bioreactor building where final effluent would be seen flowing toward the Little Thompson River during normal operation (refer to Appendix A, Photograph 23).

Since the Facility was completely offline at the time of the inspection, treated effluent was not being directed to The Little Thompson River during the inspection. However, groundwater was being pumped from the two onsite wells and was observed to be flowing to the Little Thompson River through the Waste Sump Tank (refer to Appendix A, Photograph 23). Facility representatives stated that the Facility was obligated to send a certain amount of water to the Little Thompson River even if the Facility was offline due to water rights with the Town of Milliken. An operator also stated that they were sending approximately 210,000 gallons of water to the river per day while the Facility was offline, and that the water is pumped from the groundwater wells directly through the Waste Sump Tank (refer to Appendix A, Photograph 23), where it is then pumped to the Little Thompson River without treatment.

After observing the manhole, Facility representatives, with the EPA Inspection Team, drove approximately half a mile away from the Facility to a point where discharge from the Facility was flowing out of a PVC pipe above the ground surface (refer to Appendix A, Photograph 24) into a stormwater culvert collector apron. The operator stated that this was the last place that their discharge water surfaced before being influenced or comingled with other sources such as the Town of Milliken's stormwater runoff. They stated that no sampling took place at this point, and that they only recently became aware that effluent was coming out of this pipe. This pipe was located at 40.33494° N, 104.86795° W. They expressed that stormwater and other flows were comingling with their discharge at this stage, and that they had no control

over the stormwater flows that were entering the Little Thompson River from this exposed line. After another half mile drive, the EPA Inspection Team observed the point where final effluent is released from the stormwater system, approximately 25 feet south of the Little Thompson River (refer to Appendix A, Photograph 25), and the confluence point where the final stormwater drainage comingled with treated Facility effluent discharges to the river (refer to Appendix A, Photograph 26). At the time of inspection, the water being pumped from the two groundwater wells was discharging into the Little Thompson River. The groundwater well discharge was observed at the exposed PVC pipe (refer to Appendix A, Photograph 24), and was clear and free of foams, solids, or odors.

A Facility Process Flow Diagram is included for reference in Appendix B, Exhibit 2.

Records Review

The EPA Inspection Team conducted a records review to evaluate the Permittee's compliance with the Permit. Some of the records and reports required by the Permit were available for review prior to and after the inspection. Bioreactor standard operating procedures (SOPs), operator logs, the most recent Permit application, process flow diagrams, and calibration records were reviewed offsite. The Plant's discharge monitoring reports (DMRs) were obtained electronically and reviewed offsite after the onsite inspection. The following records were requested and reviewed:

- DMR data during the period from September 1, 2019, through May 31, 2022
- Contract lab reports (September 2019 through May 2022, during months of discharge)
- Monthly Operations Reports (September 2019 through May 2022)
- Onsite laboratory bench sheet and process control data (September 2019 through May 2022)
- Compliance Order of Consent MC-160803-1 Progress Reports (2019-2021)
- Daily rounds sheets
- DMR QA Study Results
- WET Test Results (2020)
- Contract Lab Certification
- SOPs (bioreactor)
- WWTF flow diagram

III. SUMMARY OF OBSERVATIONS

The following section summarizes the EPA Inspection Team's observations relative to the Permit requirements, including the status of certain treatment units, operation and maintenance practices, and the Permittee's monitoring and reporting documentation.

Part I.A.2, Limitations, Monitoring Frequencies and Sample Types, of the Permit, identifies effluent limitations, monitoring frequencies and sample type requirements for Outfall 001A discharges.

As part of the data review, the EPA Inspection Team reviewed EPA's Integrated Compliance Information System (ICIS) database and monthly DMRs to compare reported values against effluent limitations defined in the Permit (refer to Appendix B, Exhibit 3) as well as EPA's Enforcement and Compliance History Online (ECHO) database (refer to Appendix B, Exhibit 4) in order to evaluate the Permittee's compliance with effluent limitations identified in the Permit.

Observation 1. The EPA Inspection Team observed that the Permittee experienced 8 effluent limitation exceedances during the period of review (2019-2022). Documented in EPA's ICIS database and monthly DMRs provided by the Permittee are the Facility's 8 effluent limit exceedances for Outfall 001A, experienced between March 1, 2019, and March 31, 2022 (refer to Appendix B, Exhibit 3, and Table 1 below). The ECHO database indicates the Facility was in a state of significant noncompliance (SNC) from October 1, 2019, through

March 31, 2022, with additional violations noted for the period of April 1, 2022, through June 24, 2022 (refer to Appendix B, Exhibit 4).

Table 1. Outfall 001A Final Effluent Exceedances (March 1, 2019, through March 31, 2022)

Permit #	Monitoring Period End Date	Parameter Name	DMR Value	Permit Limit	Units	Limit Type
CO0046485	09/30/2019	Mercury, total [as Hg]	< .2	.05	ug/L	30-Day Average
CO0046485	12/31/2019	Static Renewal 7 Day Chronic Ceriodaphnia dubia	7.7	18	tox chronic	Minimum Value
CO0046485	03/31/2020	Static Renewal 7 Day Chronic Ceriodaphnia dubia	11.5	18	tox chronic	Minimum Value
CO0046485	01/31/2021	Sulfide-hydrogen sulfide [undissociated]	.38	.31	mg/L	30-Day Average
CO0046485	08/31/2021	Arsenic, total recoverable	1.8	1.2	ug/L	30-Day Average
CO0046485	10/31/2021	Arsenic, total recoverable	1.8	1.2	ug/L	30-Day Average
CO0046485	10/31/2021	Selenium, potentially dissolved	18.3	12.3	ug/L	30-Day Average
CO0046485	10/31/2021	Selenium, potentially dissolved	18.3	18	ug/L	Daily Max

Observation 2. Between September 2019 and October 2021 (26 months), the Facility was not in operation for 5 months due to bioreactor shutdowns and repair (refer to Appendix B, Exhibit 5). During the 21 other months that the Facility was operational, they experienced 6 effluent limit violations, and two failed WET tests. However, when considering the effluent limits that will become effective November 1, 2023, using the reported effluent values across those 21 operational months, the Facility would experience effluent exceedances for Arsenic, H_2S, and E. Coli almost every single month, and exceedances for Selenium for several months. Facility representatives stated that even if the bioreactor was repaired structurally, they would still have difficulty meeting the new effluent limits that will be set in place starting November 1, 2023, as they already had difficulty meeting the less stringent limits that were already in place (refer to Appendix B, Exhibit 5).

Observation 3. At the time of the inspection, the EPA Inspection Team observed that the Facility had experienced numerous Permit effluent limit violations and was in significant non-compliance. Facility representatives indicated that many of the parameter exceedances and some of the failures in their treatment train are a result of variable groundwater flow rates in the system, particularly during off-peak season (winter). They stated that it is difficult to produce enough treated water, which in turn generates the appropriate wastewater flow to operate their Facility properly during the wintertime, and that switching to seasonal operation was being considered for the next Permit term. According to Facility representatives, one of the primary challenges associated with this plan is the amount of time that it takes to flush the system of "dirty water" to get back into compliance after the system has been sitting for several months. One Facility representative stated that it can take 3-4 weeks of normal process operations during a start-up before they are able to get back into compliance with their permitted effluent limits.

Part I.B.1, Facilities Operation and Maintenance, of the Permit states, "The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee as necessary to achieve compliance with the conditions of this permit."

Observation 4. According to Facility representatives, a series of structural failures in the SeHAWK bioreactor caused the Facility to be completely offline at the time of the inspection (refer to Appendix B, Exhibit 1). The seal between the metal drain plates and the bottom of the bioreactor failed during operation and had to be taken offline in October 2021. Before that, other structural failures had caused the bioreactor to be taken offline in June 2020 and January 2021. At the time of inspection, new plates were being installed in the bioreactor with upgraded seals, gaskets, and additional angle iron supports (refer to Appendix A, Photograph 9). The Facility representatives informed the EPA Inspection Team that these improvements would ideally fix the structural failures pertaining to the bioreactor. They indicated that the bioreactor rehab should be complete approximately 3-4 weeks from the time of the inspection.

Observation 5. At the time of the inspection, the EPA Inspection Team observed severe structural pitting that was taking place in the metal insides of the bioreactor. Facility representatives stated that this was a result of normal operational wear and tear (refer to Appendix A, Photograph 10).

Observation 6. At the time of inspection, Facility representatives stated that they don't currently track all of their assets, and that they were working towards that to eventually help with maintenance schedules. The Permittee currently does not utilize a CMMS software to track work orders, labor hours, or assets at the Facility. The Facility representatives stated that they use Microsoft Excel to track corrective and preventative maintenance done on select assets at the Facility (refer to Appendix B, Exhibit 1).

Part I.D.5.a, Records, of the Permit states, "The permittee shall establish and maintain records. Those records shall include, but not be limited to, the following:

i. The date, type, exact place, and time of sampling or measurements;
ii. The individual(s) who performed the sampling or measurements;
iii. The date(s) the analyses were performed;
iv. The individual(s) who performed the analysis;
v. The analytical techniques or methods used; and
vi. The results of such analysis.
vii. Any other observations which may result in an impact on the quality of the discharge as indicated in 40 CFR 122.44 (i)(1)(iii)."

Observation 7. During the records review portion of the inspection, the EPA Inspection Team noticed that white-out had been used to cover up past entries on daily lab worksheets, and new values had been written over it. The daily lab worksheets were being used to track internal process sampling, and thus the white-out was not being used to cover up compliance sampling values. This completely masked the old entries, and it was unknown why the values were changed by the Permittee (refer to Appendix B, Exhibit 6). It is recommended that corrected values have a one-line strike through, with the initials and date of who made the correction and comments as to why the correction was made.

Part II.A.2, Change in Discharge, of the Permit states, "The permittee shall give advance notice to the Division, in writing, of any planned physical alterations or additions to the permitted facility. Notice is required only when:

a. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged…"

Observation 8. At the time of the inspection, the Facility was pumping untreated water from the two onsite groundwater wells directly into the Waste Sump Tank before being pumped

directly to the Little Thompson River without any treatment (refer to Appendix A, Photographs 23 and 24). Facility representatives stated that this was normal procedure during plant shutdowns because they had to meet certain water rights limits (i.e., augmentation) set by the Town of Milliken. A Facility representative stated that they were sending 210,000 gallons of untreated well water a day to the Little Thompson River at the time of the inspection. This untreated groundwater discharge, observed at the time of inspection, was not described, or covered under the Facility's CDPS Permit (refer to Appendix C) or the Facility's Fact Sheet.

IV. CLOSING CONFERENCE

At approximately 12:50 p.m. (MDT) on June 21, 2022, the EPA Inspection Team met with the Facility representatives for a closing conference and shared preliminary observations. The EPA Inspection Team reiterated that all preliminary observations discussed were not formal compliance determinations. Any preliminary observations shared were subject to further investigation by the EPA Inspection Team upon the additional review of records and documentation. Additional observations may be contained in this inspection report that were not identified at the time of the closing conference.

The inspection concluded on June 21, 2022, at approximately 1:00 p.m. (MDT).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
RESOURCE CONSERVATION AND RECOVERY ACT

BASIC INFORMATION

Facility Name: Comanche Station

Facility Location: 2005 Lime Road
Pueblo, CO 81006

RCRA ID: COD980285944

Notification Status: SQG

Facility Contact: (b) (6), (b) (7)(C)
Environmental Analyst

Date of Inspection: May 10, 2023

Start Time: 9:15 a.m.
End Time: 4:30 p.m.

Lead Inspector: Linda Jacobson, EPA RCRA Inspector

Other Attendees:

1. (b) (6), (b) (7)(C) EPA RCRA Inspector
2. (b) (6), (b) (7)(C) CDPHE, Permitting Unit Leader
3. (b) (6), (b) (7)(C) CDPHE EPS
4. (b) (6), (b) (7)(C) Xcel Environmental Analyst
5. (b) (6), (b) (7)(C) Westech Project Manager

Type and Purpose of Inspection: Compliance Evaluation of management of coal combustion residuals (CCR) units and consent agreement requirements

Facility Type: NAICS: 221112, Fossil Fuel Electric Power Generation

Applicable Regulations to Inspection: 40 CFR 257-258 and Consent Agreement, RCRA

Inspection Type: Announced Inspection

OPENING CONFERENCE

☒ CBI warning to facility provided

Inspection Scope: The EPA conducted a compliance evaluation to gain familiarity with the location, management, and monitoring of the two CCR units at the facility, an active ash disposal facility (CCR landfill), and a bottom ash pond (BAP) undergoing closure. A Consent Agreement was entered into between the EPA and the facility on May 20, 2022, to address compliance issues and to require establishment of an appropriate groundwater monitoring network. The Consent Agreement also required, consistent with the federal CCR regulations, assessment of releases and, as appropriate, assessment of corrective measures and installation of appropriate remediation systems and closure and post-closure for the two CCR units.

I explained during the opening conference that I would draft a report within sixty days and send a copy to them within seventy days and that we will now post the reports on ECHO.

We explained that we would share a copy of any photos taken and allow them to review for confidential business information.

The state conducted a solid waste inspection under its authority. The findings of that inspection will be documented in a separate report.

(b) (7)(C), (b) (6) provided a general safety overview and cautioned to watch for slips/trips, falls, rattlesnakes and sun stroke. She described the site tour which would include the new ash treatment system, the W2 background well, the BAP, the landfill, the two wells at the landfill installed as part of the alternate source determination, and the offsite wells. I had requested to observe sampling of one of the wells being conducted by HDR. Ms. McCarter stated that HDR had to halt sampling to get more bottles and should return late morning or early afternoon.

The following information was obtained from documents reviewed prior to the inspection or verbally during the inspection from (b) (6), (b) (7)(C) unless otherwise noted.

Company Ownership: Comanche Station is owned by Public Service Company of Colorado

General Facility and Process Description:

Comanche Station is a 1450-megawatt coal-fired steam turbine plant consisting of three generating units (Units 1, 2 and 3). Unit 1 was built in 1973 and is rated at 350 megawatts. Unit 2 was built in 1975 and is rated at 350 megawatts and Unit 3 was built in 2010 and rated at 750 megawatts. Comanche Station currently has two CCR units subject to the CCR Rule, the Bottom Ash Pond and the Landfill. There are 140 employees, and the facility operates 24/7.

Unit 1 is retired. Per the air permit, the individual units have lockout/tagout, and they disconnected the gas. They will decommission as it is cleaned out. They plan to take down the cooling tower later this year and perhaps the baghouse later this year. All of the lube oil was removed from Unit 1 last week. They will also need to address lead paint and asbestos in both Units 1 and 2 prior to demolition. (b) (7)(C), (b) (6) added that it will be necessary to perform asbestos abatement before demolition of piping, boilers, gaskets and other units with asbestos.

Unit 2 is scheduled to retire in 2025; Unit 3 will be taken offline in 2030. There are no plans to convert the plant to natural gas, but it is possible that a battery system will be installed here.

The Bottom Ash Pond (BAP) was constructed with a three-foot compacted clay liner. The impoundment is approximately 505 feet long by 140 feet wide and 20 feet deep, with a surface area of approximately 1.6 acres. Bottom ash from units 1 and 2 boilers was sluiced to the BAP for dewatering and temporary storage. The dewatered bottom ash was hauled off-site for beneficial reuse or disposed in the on-site CCR landfill. The BAP stopped receiving non-CCR wastes in January 2021 and CCR wastes on June 18, 2021, when construction of a temporary treatment system for the sluice water was completed.

Of the current total CCR production, approximately 20% is bottom ash and 80% is fly ash. The Unit 3 bottom ash goes by dry conveyor to an ash silo where it is conditioned, then drops out into trucks and ECO takes to GCC cement plant for beneficial reuse. The Unit 2 bottom ash is now sluiced to the WestTech system which was installed after the BAP stopped receiving CCR waste streams. The treatment system has four sections for settling and includes chemical treatment, polymer filtration system, prior to discharge to the polishing pond, and then to the St. Charles River. The facility also maintains a diversion pond offsite with an inlet but no outlet for emergency storage or to hold if the treatment limits are not met.

The solid bottom ash is removed from the concrete bunkers, taken to the landfill for dewatering then stacked by the landfill to be taken to the GCC cement plant for reuse.

CR Minerals takes a portion of the fly ash for concrete applications. They grind up pumice stone and blend with the fly ash to reuse in a concrete slurry. The remainder of the fly ash is stored dry in a silo and conditioned when unloaded into trucks to be placed on the landfill. The ash is unloaded by truck and bladed into the landfill. Very little bottom ash is disposed in the landfill.

They keep a monthly log of the ash management, as required by the Energy Information Act. ECO Materials tracks all ash loads to the landfill and offsite, and the tracking is reported by Boral Material Technology, Inc.

[redacted] ave an update on the potential seepage from the adjacent polishing pond into the closing BAP. Their contractor, HDR, put in a bermed area and dug a hole to see if there was also groundwater intrusion. They plan to complete closure of the BAP this year. Closure will include the removal of all visual contamination then they will test for CCR constituents. It is planned to remove the clay liner and install a sump to allow stormwater to flow into the aquifer, due to water rights issues .

[redacted] stated that he would conduct a solid waste inspection, since he hadn't been there since 2018. He would review annual training, sampling and inspection records. He requested training records for 2021 and 2022, paint filter test records, annual facility inspections of the landfill and ash sample records. He also requested the leachate sampling records required annually.

The facility conducts three CCR weekly inspections, 2021 annual inspection, 2022 annual inspection. The facility conducts the weekly CCR inspections, and a professional engineer conducts the annual inspections.

[redacted] that the last round of ash sampling results was from 2016. An ash sample is required to be collected and analyzed every three years. [redacted] explained that she sent samples to the lab but received no record of this or test results for the 2019 sample.

[redacted] discussed upcoming drilling work at other Xcel facilities. She also provided updates on document submittals required by the RCRA Consent Agreement with the EPA.

CBI: No CBI was discussed during the inspection.

Areas of the facility toured:

The inspection team did a driving tour of the facility in two separate vehicles, stopping periodically to observe, ask questions and collect photographs.

We stopped at Unit 1, which is retired. We saw the Unit 2 Bottom Ash Treatment System, managed by Westech. We were joined by [redacted] Westech Project Manager, who provided an overview of the system. There are four basins for settling. The water is treated with rapid sand filtration with polymer addition. Hydrocyclones separate sand for reuse. The solids collect in two bunkers. The water is discharged into a clear well for reuse. The treatment system is run twice daily in the day and evening every day, seven days per week. There are two operators when running. Bunker zones 1 and 2 are piped to rapid sand. Solids are routed to zone 3 or 4. Recycle water is routed back to zone 1 and 2. They use Claraid to settle solids. There are two cyclones located at the top of the unit.

We looked at the east and west lime ponds and the bottom ash pond, which is undergoing closure. Water coming into the BAP was initially thought to be from the adjacent polishing pond, but now their contractor thinks this could be groundwater recharge into the BAP. The contractor had dug small exploratory holes which continue to fill with water, and they are pumping 3000 gallons/day where there is either groundwater recharge or surface water intrusion.

The facility process water is discharged under a Colorado Pollution Discharge Elimination System (CPDES) wastewater permit. The polishing pond is the last step in treatment, using CO_2 for pH adjustment before discharge to the St. Charles River. The facility conducts daily, weekly, monthly and quarterly sampling as required by the permit.

We drove to the ash disposal facility. On the north end of the landfill, we saw about two weeks' worth of bottom ash awaiting to be picked up by GCC. The landfill is constructed with three chimney drains which discharge into perforated pipes into the leachate system. They stockpile ash from the Unit 2 Westech bunkers around the chimney drains; when it is dry, the ash is taken down for storage to take offsite for beneficial reuse. GCC makes pickups two to three times per week, with each load being 200 to 250 tons per week. The fly ash and boiler lime sludge are disposed in the landfill. They use water for daily cover. A portion of the fly ash is now reused by CR Minerals. We observed a truck disposing fly ash with a grader smoothing it out on the top of Cell 2 east.

After the state left due to bad weather, [redacted] provided the EPA inspectors a tour of the following areas: MW 5 and 9. MW 2 A, B and C which are background wells. We also saw the offsite wells, MW-18, and the emergency pond into which they divert the treated water if they can't meet discharge standards or have an emergency.

[redacted] collected photographs which were shared with [redacted] after the inspection to allow her to screen them for CBI. [redacted] confirmed in an email, dated May 31, 2023, that all photos are releasable. They are labeled and attached to this report.

Facility Name: Comanche Station
Facility Location: 2005 Lime Road, Pueblo, CO 81006
Date of Inspection: May 10, 2023

Records Review: In preparation for the inspection, I reviewed the Engineering Design and Operation Plan (EDOP), dated January 19, 2018, for the ash disposal facility (landfill), the last state inspection report, and the closure plan for the BAP, dated June 28, 2013, submitted to the state, which also included the Inventory and Classification Preliminary Report.

The state inspector, [redacted] had a checklist for the facility landfill permit. He reviewed inspection logs, training records, analytical and other records. He reviewed the training content and training sign-in sheets for 2 years and spot-checked weekly inspections. I also reviewed the records which the state inspector requested and reviewed.

Closing Conference and Identified Issues:

Due to severe weather, including thunderstorms and a tornado watch, the state left at 3:30 p.m. Prior to leaving, [redacted] discussed his inspection findings. He noted a minor violation. The facility had not collected, analyzed or submitted the results for an ash sample, as required by the permit since 2016. He suggested the facility collect a new 2023 ash sample as soon as possible. He also offered compliance assistance, including improvements to the erosion control maintenance, the addition of initial trainings to the operating record, and keeping an eye on the east stormwater ditch to keep flyash out. The state also requested updates on the bottom ash pond closure and source of recharge into the pond.

[redacted] asked about the background soil study. [redacted] noted that samples were to be collected in June and results sent to the state and the EPA.

After the state and [redacted] left for the day, [redacted] provided the two EPA inspectors a site tour of some of the additional onsite and offsite monitoring well locations. A discussion of the areas visited is located in that section of this report.

The facility activities, as noted during the inspection, and supported by submittals required by the federal Consent Agreement, document progress implementing the federal CCR requirements. No concerns were noted for the scope of the onsite evaluation conducted.

This report will be provided to the facility representatives and to the state.

SIGNATURE

Lead Inspector: LINDA JACOBSON Digitally signed by LINDA JACOBSON Date: 2023.06.26 12:59:41 -06'00'

RCRA & OPA Enforcement Branch Manager: JANICE PEARSON Digitally signed by JANICE PEARSON Date: 2023.06.27 17:20:43 -06'00'

Attachment 1: Photographs