U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 8 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM STATEMENT OF BASIS

PERMITTEE:	U.S. Department of the Air Force
FACILITY NAME AND ADDRESS:	Air Force Academy Wastewater Treatment Plant
	SW1/4, SW1/4 sec. 19, T.12 S, R.66 W USAF Academy, CO 80840
PERMIT NUMBER:	CO-0020974
RESPONSIBLE OFFICIAL:	Colonel Brian S. Hartless 8034 Edgerton Drive, Suite 200 USAF Academy, CO 80840-2400
FACILITY CONTACT:	Barry Schatz, Environmental Chief (719) 333-6716 barry.schatz.2@us.af.mil
PERMIT TYPE:	Major, Permit Renewal, Federally Owned Facility
FACILITY LOCATION:	Longitude 104.830000° W and Latitude 38.984722° N SW1/4, SW1/4 sec. 19, T.12 S, R.66 W

1 INTRODUCTION

This statement of basis (SoB) is for the issuance of a National Pollutant Discharge Elimination System (NPDES) permit (the Permit) to the United States Department of the Air Force for the Air Force Academy Wastewater Treatment Facility (Facility). The Permit establishes discharge limitations for any discharge of wastewater from the Facility through Outfall 001A to Monument Creek and through Outfall 001B to Non-Potable Reservoir Number 1 (NPR#1). The SoB explains the nature of the discharges, EPA's decisions for limiting the pollutants in the wastewater, and the regulatory and technical basis for these decisions.

The Facility is a federal facility in Colorado. EPA Region 8 is the NPDES permitting authority for federal facilities located in Colorado.

2 MAJOR CHANGES FROM PREVIOUS PERMIT

Major changes from the previous permit include the following:

- Reasonable potential analyses were performed based on monitoring results from the previous permitting cycle. Results were used to assign further monitoring and determine appropriate limits. Limits have been added for the following parameters. See Section 6.2 of this SoB.
 - Sulfide, Section
 - o Cyanide
 - o Cadmium (Cd), Dissolved
 - Hexavalent Chromium (Cr+6), Dissolved
 - Copper (Cu), Dissolved
 - o Iron (Fe), Dissolved
 - Manganese (Mn), Dissolved
 - Mercury (Hg), Total Recoverable
 - Zinc (Zn), Dissolved
 - Temperature
 - Updated ammonia limits were calculated using CDHPE's AMMTOX model. See Section 6.2.3.1 of this SoB.
- PFAS monitoring requirements will be included in this renewal permit. See Section 7.1.1 of this SoB.
- Changes have been made to the Whole Effluent Toxicity effluent limitations. See Section 6.2.6 of this SoB.

3 BACKGROUND INFORMATION

This SoB is for the renewal of the NPDES permit for the Air Force Academy (AFA) wastewater treatment facility (WWTF) (see Figure 1). The WWTF is located at approximately latitude 38.984722° N and longitude104.830000° W (SW1/4, SW1/4 sec. 19, T.12 S, R.66 W) on the west bank of Monument Creek, in the southeastern portion of the AFA.

The AFA is the Air Force's military service academy, equivalent to the Army's Military Academy at West Point and the Navy's Naval Academy at Annapolis. Under the North American Industrial Classification System (NAICS), which replaced the Standard Industrial Classification (SIC) Code, military academies at the college level have the classification 611310 (SIC Code 8221), Colleges, Universities, and Professional Schools. Military service academies do not come under the classification 928110 (SIC Code 9711), National Security.

The AFA covers an area of approximately 19,000 acres and is located just to the north of the city of Colorado Springs and extends approximately six miles along Interstate Highway 25 (I-25). Most of the AFA is located west of I-25, extending into the edge of the foothills of the Rocky Mountains. According to the permit application, the WWTF serves a population of approximately 6,860. This includes students, housing units for military personnel, and workers that do not live at the AFA. The most recent permit application states that the facility collection system is a 100% sanitary sewer. Based on information obtained by EPA, the AFA includes food service establishments (e.g., a restaurants and cafeterias), a hospital, other medical clinics, an automotive hobby shop/skills center and an airfield with hangers. The WWTF has a design flow rate of 1.45 million gallons per day (mgd), however, in 2019 (year the most recent permit application was submitted) the facility's annual average flow rate was 0.55 mgd.



Figure 1. Aerial of Treatment Facility

3.1 Facility Treatment Process Overview

The AFA WWTF was constructed in about 1958 and has undergone several modifications since then, with the last major modification done in 1996. Ultraviolet disinfection was added in 2005. The treatment process includes preliminary treatment (bar screens and grit separation), a flow control weir for diverting excess flow to an off-channel flow equalization basin with

aeration, a primary clarifier, two oxidation ditches in parallel, four secondary clarifiers, three filters for filtering the secondary effluent, and ultraviolet disinfection. Typically, only one oxidation ditch and two secondary clarifiers are used. There are chlorination facilities available in case they are needed.

Biosolids are thickened and anaerobically digested in a primary digester and two secondary digesters. The treated biosolids are hauled offsite to Delorenzo McDonald Farms for land application on agricultural land. There are sludge drying beds that are used for backup storage when weather or site conditions prevent the land application of the biosolids as a liquid.



Figure 2. Schematic Overview of Facility

After treatment, the effluent may be either discharged to Monument Creek via Outfall 001A or to NPR#1 via Outfall 001B. Normally all the effluent is discharged through Outfall 001B (latitude

38.998677°N, longitude 104.835000°W) and is pumped via a pipeline to Non-Potable Reservoir No. 1 (NPR#1) for subsequent use in the irrigation of approximately 184 acres of landscape, recreational fields, etc. NPR#1 is located approximately 1 mile north of the WWTF on Lehman Run, an ephemeral drainage tributary to Monument Creek (Figure 3). The flow from the pipeline enters NPR#1 as a surface flow on the south side of the reservoir near the west end of the reservoir.



Figure 3. Location of Monument Creek Relative to AFA WWTF

Water can be pumped from NPR#1 to NPR#2, from NPR#2 to NPR#3, and from NPR#3 to NPR#4 (see Figure 4). NPR#2 and NPR#3 are located near the headwaters of ephemeral drainages tributary to Monument Creek and there is very little stormwater drainage into those two reservoirs. NPR#4 is located on Goat Camp Creek, which flows into Deadmans Creek, a tributary to Monument Creek. The State of Colorado Regulation No. 32 – Classifications and Numeric Standards for Arkansas River Basin specifically calls out NPR#1 as a waterbody subject to the water quality standards developed for Monument Creek Segment 11. According to the last permit issuance, none of the non-potable reservoirs are lined.

The discharge from Outfall 001A enters Monument Creek via a pipe just to the south of the WWTF (latitude 38.982644° N, longitude104.830175° W). Normally there is no discharge from Outfall 001A.



Figure 4. Location of Non-Potable Reservoirs on AFA

The permit record indicates the capacities and irrigation uses for the four non-potable reservoirs listed in Table 1.

Non-Potable Reservoir	Latitude, Longitude	Reservoir Capacity (Gallons)	Areas Irrigated
1	38.998677°N, 104.835000°W	31,850,000	Median Strips
2	39.008469°N, 104.858432°W	71,825,000	Recreational Facilities & Cemetery
3	39.014460°N, 104.871110°W	36,075,000	Parade Field & Athletic Fields
4	39.010345°N, 104.897292°W	22,100,000	N/A

Table 1. Summary of Facility Non-Potable Reservoir Capacity

During the irrigation season, the supply of water for irrigation is supplemented by water pumped from seven wells located on the AFA property. The water rights for those wells are for irrigation use only and pumping from those wells is limited to the irrigation season. Water from three of the wells (1A, 1B, and 5A) is conveyed to NPR#1 by the same pipeline that contains the effluent from Outfall 001B. Water from well 9A is discharged into NPR#1 at the point where the pipeline from the WWTF discharges into NPR#1. Water from the three other wells goes into the irrigation water distribution system north of NPR#1. The volume of water from the four wells going into NPR#1 varies and at times may equal or exceed the flow from the WWTF.

3.2 Chemicals Used

The facility does not use chemical treatment as a part of its normal operations. UV lights provide the primary form of disinfection; however, the facility does have the ability to use chlorination as an alternate disinfection method.

4 PERMIT HISTORY

According to EPA records maintained for the Facility, this renewal is at least the 6th renewal of this NPDES permit. The previous permit for the Facility became effective on February 1, 2015 and was set to expire on December 31, 2019. The Facility submitted a permit renewal application prior to the permit's expiration, and thus the previous permit was administratively continued.

4.1 Discharge Monitoring Report (DMR) Data

Discharge monitoring data was evaluated for the period beginning with the effective date of the last permit and ending with the date of query in the ICIS database (Feb 2015 – July 2021). Fifteen violations were identified by ICIS during this timeframe; twelve of these were for overdue monitoring results, and three were for reported numeric effluent violations. Summaries of DMR Data submitted for Outfalls 001A and 001B are provided in Tables 2 & 3 below, and the Facility's violation data is listed in Table 4 below.

Table 2. Summary of the DMR Data (February 2015 – November 2021) for Outfall 001A
from EPA Integrated Compliance Information System (ICIS) database (date accessed
November 21, 2021)

Permit Limit	Reported Average	Reported Range	Number of Data Points	Number of Violations
1.4	0.470	0.007 - 0.983	9	
25(132)	3.00(5.30)	1.80(1.48) - 4.40(9.59)	9	
	Permit Limit 1.4 25(132)	Permit Limit Reported Average 1.4 0.470 25(132) 3.00(5.30)	Permit Limit Reported Average Reported Range 1.4 0.470 0.007 - 0.983 25(132) 3.00(5.30) 1.80(1.48) - 4.40(9.59)	Permit LimitReported AverageReported RangeNumber of Data Points1.40.4700.007 - 0.983925(132)3.00(5.30)1.80(1.48) - 4.40(9.59)9

Parameter	Permit Limit	Reported Average	Reported Range	Number of Data Points	Number of Violations
Carbonaceous Biochemical Oxygen Demand (CBOD ₅), mg/L (Kg/day) 7-Day Average <u>a/</u>	40(212)	4.13(8.22)	2.00(3.77) - 7.00(15.1)	9	
Total Suspended Solids , mg/L (Kg/day) 30- Day Average <u>a</u> /	30(159)	3.18(5.99)	0.400(1.49) - 5.56(11.8)	9	
Total Suspended Solids , mg/L (Kg/day) <u>a</u> / 7-Day Average	45(238)	4.44(9.18)	0.400(1.46) - 8.07(16.6)	9	
pH Minimum & Maximum	6.50 - 9.00	7.40	6.70 - 8.20	18	
Total Residual Chlorine, μg/L Daily Maximum	0.019	DID NOT REPORT	DID NOT REPORT	NA	
Total Residual Chlorine, μg/L 30-Day Average	0.011	DID NOT REPORT	DID NOT REPORT	NA	
<i>E. coli</i> , no./100 mL 30-Day Geometric Mean	126	15.2	1.36 - 52.0	9	
<i>E. coli</i> , no./100 mL 7-Day Geometric Mean	252	40.1	2.00 - 189	9	
Total Inorganic Nitrogen, mg/L 30-Day Average	13	10.7	2.57 - 20.0	9	2
Total Ammonia as N, mg/L					
January Daily Maximum	23	1.57	NA	1	
January 30-Day Average	15	0.89	NA	1	
February Daily Maximum	18	1.35	NA	1	
February 30-Day Average	13	0.52	NA	1	

Parameter	Permit Limit	Reported Average	Reported Range	Number of Data Points	Number of Violations
March Daily Maximum	18	2.81	NA	1	
March 30-Day Average	14	1.34	NA	1	
April Daily Maximum	23	NA	NA	1	
April 30-Day Average	10.5	NA	NA	NA	
May Daily Maximum	21	0.72	0.11 - 1.33	2	
May 30-Day Average	10.5	0.65	0.05 - 1.24	2	
June Daily Maximum	22	0.16	NA	1	
June 30-Day Average	10.2	0.06	NA	1	
July Daily Maximum	24	NA	NA	NA	
July 30-Day Average	10	NA	NA	NA	
August Daily Maximum	24;	1.22	NA	1	
August 30-Day Average	10	0.30	NA	1	
September Daily Maximum	20	NA	NA	NA	
September 30-Day Average	9	NA	NA	NA	
October Daily Maximum	12	NA	NA	NA	
October 30-Day Average	9.4	NA	NA	NA	

Parameter	Permit Limit	Reported Average	Reported Range	Number of Data Points	Number of Violations
November Daily Maximum	16	2.24	NA	1	
November 30-Day Average	12.8	0.87	NA	1	
December Daily Maximum	16.5	1.84	NA	1	
December 30-Day Average	12.7	0.56	NA	1	
WET	<u>b</u> /	<u>b</u> /	<u>b</u> /	NA	

 $\underline{\mathbf{a}}$ / The limitation is based on CBOD₅ instead of BOD₅ due to the presence of nitrifying bacteria at the Facility.

 <u>b</u>/ Pass/ Fail limitation, "There shall be no chronic toxicity at an instream waste concentration (IWC) of 56 percent of the final effluent from Outfall 001A." Therefore a range of values cannot be reported for this parameter. No violations reported during previous permitting cycle.

Table 3. Summary of the DMR Data (February 2015 – November 2021) for Outfall 001Bfrom EPA Integrated Compliance Information System (ICIS) database (date accessed
November 21, 2021)

Parameter	Permit Limit	Reported Average	Reported Range	Number of Data Points	Number of Violations
Flow, MGD 30- Day Average	1.4	0.51	0.30 - 0.94	79	
Carbonaceous Biochemical Oxygen Demand (CBOD ₅), mg/L (Kg/day) 30- Day Average <u>a/</u>	25(132)	2.72(5.18)	0.70(1.17) - 6.70(12.7)	79	
Carbonaceous Biochemical Oxygen Demand (CBOD ₅), mg/L (Kg/day) 7-Day Average <u>a/</u>	40(212)	4.05(8.21)	0.87(1.67) - 15.6(35.22)	79	

Total Suspended Solids, mg/L (Kg/day) 30- Day Average <u>a</u> /	30(159)	3.18	1.00 - 10.8	79	
Total Suspended Solids, mg/L (Kg/day) <u>a</u> / 7-Day Average	45(238)	5.04(10.3)	1.20(2.25) - 24.2(41.5)	79	
pH Minimum & Maximum	6.5 - 9.0	7.43	6.30 - 8.50	158	1
Total Residual Chlorine, μg/L Daily Maximum	0.019	DID NOT REPORT	DID NOT REPORT	NA	
Total Residual Chlorine, μg/L 30-Day Average	0.011	DID NOT REPORT	DID NOT REPORT	NA	
<i>E. coli</i> , no./100 mL 30-Day Geometric Mean	126	9.60	1.00 - 52.0	79	
<i>E. coli</i> , no./100 mL 7-Day Geometric Mean	252	35.2	1.00 - 189	79	
Total Ammonia as N, mg/L					
January Daily Maximum	13	2.90	1.50 - 4.05	6	
January 30-Day Average	5.1	0.99	0.49 - 1.60	6	
February Daily Maximum	11	1.33	0.50 - 2.57	7	
February 30-Day Average	4.7	0.51	0.15 - 1.06	7	
March Daily Maximum	7.3	1.05	0.019 - 2.81	7	
March 30-Day Average	3.2	0.37	0.003 - 1.34	7	
April Daily Maximum	6.1	0.77	0.72 - 1.90	7	
April 30-Day Average	1.9	0.30	0.02 - 1.05	7	

May Daily Maximum	7.9	1.03	0.00 - 2.45	7	
May 30-Day Average	2.4	0.53	0.00 - 1.44	7	
June Daily Maximum	10	1.27	0.13 - 3.34	6	
June 30-Day Average	3.0	0.48	0.03 - 1.55	6	
July Daily Maximum	9.7	0.95	0.14 - 2.34	7	
July 30-Day Average	2.3	0.34	0.06 - 1.00	7	
August Daily Maximum	7.9	1.24	0.53 - 2.16	7	
August 30-Day Average	1.9	0.44	0.13 - 0.71	7	
September Daily Maximum	8.7	1.18	0.19 - 2.41	7	
September 30-Day Average	2.3	0.48	0.03 - 1.17	7	
October Daily Maximum	11	1.62	0.05 - 5.05	6	
October 30-Day Average	3.4	0.63	0.05 - 1.61	6	
November Daily Maximum	11	1.08	0.08 - 2.24	6	
November 30-Day Average	3.7	0.41	0.05 - 0.87	6	
December Daily Maximum	8.9	2.06	0.63 - 4.82	6	
December 30-Day Average	3.7; 30- Day Average	0.68	0.13 - 1.17	6	
WET	<u>b</u> /	<u>b</u> /	<u>b</u> /	NA	

- $\underline{\mathbf{a}}$ / The limitation is based on CBOD₅ instead of BOD₅ due to the presence of nitrifying bacteria at the Facility.
- <u>b</u>/ Pass/ Fail limitation, "There shall be no chronic toxicity at an instream waste concentration (IWC) of 56 percent of the final effluent from Outfall 001A." Therefore a range of values cannot be reported for this parameter. No violations reported during previous permitting cycle.

Outfall	Month of Violation	Parameter	Permit Limit	DMR Value	% Over / Under Limit
001-A	August 2016	Nitrogen, inorganic total, 30-Day Avg.	13.0	20.0	54.0%
001-A	January 2017	Nitrogen, inorganic total, 30-Day Avg.	13.0	18.5	42.0%
001-B	March 2020	pH, Minimum	6.50	6.30	N/A

Table 4. ICIS Effluent Violation Summary for Period of Feb 2015 – July 2021

4.2 Other Facility History

The last EPA inspection of the AFA WWTF was completed on April 24, 2018. Based on discussion with facility representatives and the review of records, the EPA inspectors identified that, at the time of inspection, the Facility had experienced at least two confirmed and one suspected unanticipated internal bypasses of the sand filters and UV disinfection system over the three-year period preceding the inspection. These bypasses comprised of overflow from the wet well following the secondary clarifiers and flowed directly to the effluent. None of the three confirmed or suspected bypasses were reported to EPA at the time of inspection. Email records provided by Aleut (contractor operating this facility at the time of the inspection) indicate Aleut reported the November 28, 2017 bypass to USAFA, but no notification was provided by USAFA to EPA. The bypass events are detailed in Table 5 below.

Records also indicate that on May 8, 2017 a pipe failure caused the release of 300 - 400 gallons of glycol/ water mixture (36.2% glycol) to be released to the AFA WWTF. Communications from the AFA Environmental Program manager to EPA Region 8 Enforcement Branch indicate that no upset conditions occurred due to this release.

Date	Description of Bypass Event	Suspected Cause	Outfall
Friday, 10/23/2015	Confirmed based on operator log book entry: "Flow is bypassing UV and Filters [sic]"	Hydraulic overloading during wet weather event	Outfall 001B to NPR #1

Table 5. Confirmed and Suspected Internal Bypass Events

Saturday, 09/23/2017	Suspected based on operator log book entry: "Lots of fast rainWet well about to by- pass filters and UV."	Hydraulic overloading during wet weather event	Outfall 001B to NPR #1
Tuesday, 11/28/2017	Confirmed based on information provided in [facility contractor's] May 9, 2018, Response to Environmental Protection Agency's Preliminary Findings and Records Request and operator log book entry: "Power out at 1900Power oN [sic] @ 2045Called BDPut some Eff in old Cl ₂ contact chamber"	Unanticipated operation difficulties associated with planned power outage	Outfall 001B to NPR #1

5 DESCRIPTION OF RECEIVING WATER

In 2021, the Colorado Water Quality Control Commission (WQCC) made revisions to the water quality classifications, standards and designations for multiple segments in the Arkansas River Basin, Regulation #32 (5 CCR 1002-32). The changes were effective December 31, 2021.

Discharges from Outfall 001A to Monument Creek are in segment 6 of the Fountain Creek basin. Per the most recent iteration of Regulation #32, segment 6 is comprised of the main stem of Monument Creek from the boundary of National Forest lands to the confluence with Fountain Creek. Segment 6 is undesignated, which means antidegradation analyses must be considered when determining effluent limitations for Outfall 001A. Segment 6 is classified for Aquatic Life Warm 2, Recreation E, Water Supply, and Agriculture.

Discharges from Outfall 001B to NPR#1 are in Fountain Creek segment 11. This segment includes "the lakes and reservoirs tributary to Fountain Creek which are not within the boundaries of National Forest or Air Force Academy lands, except AFA Non-Potable Reservoir #1, from a point immediately above the confluence with Monument Creek to the confluence with the Arkansas River, formerly in Segment 4." On March 11, 2014 the WQCC changed the designation of Fountain Creek segment 11 from "Undesignated" to "Use Protected." Like segment 6, segment 11 is classified for Aquatic Life Warm 2, Recreation E, Water Supply, and Agriculture. The classifications, designations and WQS for Fountain Creek segment 6 and the new Fountain Creek segment 11 are given in Table 7a-7d below.

NPR#'s 2-4 are in Fountain Creek segment 10. Water Quality Standards for segment 10 were not evaluated for effluent limit determinations because there is no direct discharge from the WWTF to the other three NPRs. Any wastewater going into those three NPRs is pumped from NPR#1 to NPR#2, then to NPR#3, and sometimes to NPR#4.

6 PERMIT LIMITATIONS

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Oil& Grease

6.1 Technology Based Effluent Limitations (TBELs)

The TBELs for the Facility are listed in Tables 6a-6b below. The limitations on 5-day carbonaceous biochemical oxygen demand (CBOD₅) and total suspended solids (TSS) were based on the national Secondary Treatment Regulation (40 CFR Part 133) and the Colorado Water Quality Control Commission's Regulation 62, Regulations for Effluent Limitations – the most stringent requirements will be selected from state and EPA regulation to be included in final effluent limitations (See Tables 26&27). The secondary treatment standards (40 CFR Part 133) have been developed by EPA and represent the level of effluent quality attainable through the application of secondary or equivalent treatment. The regulation applies to all publicly owned treatment works (POTWs).

Parameter	30-day average (mg/L)	7-day average (mg/L)	30-day average percent removal (%)
CBOD5 <u>a</u> /	25	40	85
TSS	30	45	85
pH	Maintair	ned within the limits of	6.0 to 9.0

 $\underline{\mathbf{a}}$ / The limitation is based on CBOD₅ instead of BOD₅ due to the presence of nitrifying bacteria at the Facility.

Table 00. Colorado Regulation 100. 02 – Regulations for Efficient Efficients				
Parameter	30-day average (mg/L)	7-day average (mg/L)	30-day average percent removal (%)	
CBOD5 <u>a</u> /	25	40	85 <u>b</u> /	
TSS	30	45	85 b/	

Table 6b. Colorado Regulation No. 62 – Regulations for Effluent Limitations

Maintained within the limits of 6.0 to 9.0

The concentration of oil and grease in any single sample shall not

exceed 10 mg/L. \underline{d} /

 $\underline{\mathbf{a}}$ / The limitation is based on CBOD₅ instead of BOD₅ due to the presence of nitrifying bacteria at the Facility.

- **b**/ Percentage Removal Requirements (TSS and CBOD₅ Limitation): In addition to the concentration limits for total suspended solids and CBOD₅ indicated above, the arithmetic mean of the concentration for effluent samples collected in a 30-day consecutive period shall not exceed 15 percent of the arithmetic mean of the concentration for influent samples collected at approximately the same times during the same period (85 percent removal).
- \underline{c} / Colorado Regulation 62 states, "A numeric effluent limit will be assigned in permits for discharges to surface waters, however, monitoring for a "visual sheen" will generally be required. Where a visual sheen is detected, the discharger will be required to collect a grab sample and have it analyzed for oil and grease. Monitoring for oil and grease may be required where there is a reasonable potential that oil and grease will be present in the effluent at concentrations at or above 10 mg/l."

EPA Region 8 has also developed a technology based and water quality based guidance on oil and grease for POTWs. It states "if a visible sheen or floating oil is detected in the discharge, a grab sample shall be taken immediately, analyzed and recorded in accordance with the requirements of 40 CFR Part 136. The concentration of oil and grease shall not exceed 10 mg/L in any sample." The visual narrative "sheen or floating oil" requirement was developed in alignment with 40 CFR § 401.16 which lists "oil and grease" as a conventional pollutant (as related to technology-based limitations in line with 40 CFR § 125.3(h)(1)) pursuant to section 304(a)(4) of the Act, as well as the National Recommended Aquatic Life Criteria which recommends that "surface waters shall be virtually free" from floating oils of petroleum origin and floating nonpetroleum oils of vegetable or animal origin, as "floating sheens of such oils result in deleterious environmental effects." This consideration for oil and grease will be included in the Permit.

6.2 Water Quality Based Effluent Limitations (WQBELs)

The Facility discharges from Outfall 001A to Monument Creek in segment 6 of the Fountain Creek basin (COARFO06) and from Outfall 001B to NPR#1 in Fountain Creek segment 11 (COARFO11). The receiving waters are within the state of Colorado and thus the state of Colorado's water quality standards (WQS) apply. EPA has reviewed the applicable State water quality standards for consideration of the development of WQBELs.

Fountain Creek Segment	Segment 6	Segment 11
Designation	Reviewable	Use Protected
Classification	Aq Life Warm 2	Aq Life Warm 2
	Recreation E	Recreation E
	Water Supply	Water Supply
	Agriculture	DUWS <u>a</u> /

Table 7a. Fountain Creek Segment Designations & Classifications per ColoradoRegulation 32

<u>a</u>/ Direct Use Water Supply (DUWS) Classification: DUWS applies to Lower Reservoir, Keeton Reservoir, Unknown Reservoir at 38.70939°, -104.82928° (AFA WWTF Non Potable Reservoir #1), Gold Camp Reservoir, South Suburban Reservoir.

Table 7b. Physical & Biological Water Quality Standards for Fountain Creek Segments 6& 11 a/

Parameter	Segment 6	Segment 11
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Temperature, ℃	T=TVS ;(WS-II) °C	T = TVS (WL) °C
	<u>a</u> /	<u>b</u> /
D.O., mg/L	D.O. (ch) = 5.0 mg/L	D.O. = 5.0 mg/L
рН	pH = 6.5-9.0	pH = 6.5-9.0
<i>E.coli</i> (per 100 mL)	<i>E. coli</i> = 126/100 mL	<i>E. coli</i> = 126/100 mL
Chlorophyll <i>a</i> (Chla), mg/m2	Chla = 150 μ g/L <u>c</u> /	$Chla = 20 \ \mu g/L \ \underline{d}/$

- **a**/ Colorado Regulation 32 assigns segment specific temperature standards based on the indicated classification. TVS = Table Value Standard. WS-II = Warm Stream, Tier Two. See section 6.2.2.3 for further information.
- $\underline{\mathbf{b}}$ / Colorado Regulation 32 assigns segment specific temperature standards based on the indicated classification. TVS = Table Value Standard. WL = Warm Lake. See section 6.2.2.3 for further information.
- \underline{c} / Chlorophyll *a* standards apply only above existing facilities listed in Colorado Regulation 32, Section 32.5(4). This does not apply to the AFA WWTF at this time.
- $\underline{\mathbf{d}}$ / Chlorophyll *a* standards apply only to lakes and reservoirs larger than 25 acres surface area. (Note: NPR#1 has a maximum surface area less than 25 acres.)

Table 7c. Inorganic Water Quality Standards for Fountain Creek Segments 6 & 11 (mg/L)

Parameter	Segment 6		Segment	11
	Acute (mg/L)	Chronic (mg/L)	Acute (mg/L)	Chronic (mg/L)
Ammonia	TVS <u>a</u> /	TVS <u>a</u> /	TVS <u>a</u> /	TVS <u>a</u> /
Boron		0.75		0.75
Chloride		250		250
Chlorine	0.019	0.011	0.019	0.011
Cyanide	0.005		0.005	
Nitrate	10		10	
Nitrite		0.05		0.5

Phosphorous	 0.017 <u>b</u> /	 0.083 <u>c</u> /
Sulfate	 WS <u>d</u> /	 WS <u>d</u> /
Sulfide	 0.002	

- $\underline{\mathbf{a}}$ / TVS = Table Value Standard.
- **b**/ Phosphorous standards apply only above existing facilities listed in Colorado Regulation 32, Section 32.5(4). This does not apply to the AFA WWTF at this time.
- $\underline{\mathbf{c}}$ Phosphorous standards apply only to lakes and reservoirs larger than 25 acres surface area. (Note: NPR#1 has a maximum surface area less than 25 acres.)
- <u>d</u>/ For a sulfate standard denotation of "WS" the greater of ambient water quality as of January 1, 2000 or 250 mg/L applies. At this time the water supply standard for sulfate, 250 mg/L, will apply to discharges from AFA WWTF.

Table 7d. Metals Water Quality Standards for Fountain Creek Segments 6 & 11 (µg/L)

Parameter	Segment 6		Segn	ent 11
	Acute (µg/L)	Chronic (µg/L)	Acute (µg/L)	Chronic (µg/L)
Arsenic	340		340	
Arsenic (T)		0.02 -10 <u>a</u> /		0.02 -10 <u>a</u> /
Cadmium	TVS <u>b</u> /	TVS	TVS	TVS
Cadmium (T)	5.0		5.0	
Chromium +3		TVS		TVS
Chromium +3 (T)	50		50	
Chromium +6	TVS	TVS	TVS	TVS
Copper	TVS	TVS	TVS	TVS

Iron		WS <u>c</u> /		WS <u>c</u> /
Iron (T)		1000		1000
Lead	TVS	TVS	TVS	TVS
Lead (T)	50		50	
Manganese	TVS	TVS/WS <u>d</u> /	TVS	TVS/WS <u>e</u> /
Mercury (T)		0.01		0.01
Molybdenum (T)		150		150
Nickel	TVS	TVS	TVS	TVS
Nickel (T)		100		100
Selenium	TVS	TVS	TVS	TVS
Silver	TVS	TVS	TVS	TVS
Uranium	Varies*	Varies*	Varies*	Varies*
Zinc	TVS	TVS	TVS	TVS

<u>a</u>/ Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Colorado Water Quality Control Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number in the range.

- **<u>b</u>**/ "TVS" denotes Table Value Standards. Water quality standards are calculated based on a representative hardness & equations from Colorado Regulation 32, Section 32.6(3).
- \underline{c} / For a dissolved iron standard denotation of "WS" the greater of ambient water quality as of January 1, 2000 or 300 µg/L applies. At this time the water supply standard for dissolved iron, 300 µg/L, will apply to discharges from AFA WWTF.
- $\underline{\mathbf{d}}$ For a dissolved manganese standard denotation of "WS" the greater of ambient water quality as of January 1, 2000 or 50 µg/L applies. At this time the ambient water quality as of January 1, 2000 will be the standard for dissolved manganese. A standard of 152 µg/L will apply to discharges from AFA WWTF, Outfall 001A.
- \underline{e} / For a dissolved manganese standard denotation of "WS" the greater of ambient water quality as of January 1, 2000 or 50 µg/L applies. At this time the water supply standard for dissolved manganese, 50 µg/L, will apply to discharges from AFA WWTF, Outfall 001B.
- 6.2.1 Water Quality Considerations for Outfall 001A

Although discharges from Outfall 001A to Monument Creek seldom occur, it is occasionally necessary for the Permittee to discharge from Outfall 001A when it is not practical to discharge from Outfall 001B to NPR#1. The pollutants of potential concern for a discharge to Monument Creek include *E. coli*, total inorganic nitrogen, ammonia, metals and cyanide.

As shown in Table 7d above, standards for metals are generally shown in the regulations as Table Value Standards (TVS), which must be derived from equations that depend on the receiving stream hardness and / or the species of fish present in a given segment. A regression analysis of the hardness data for USGS gaging station 07103780 was performed per Colorado Regulation 32. Based on the results of that analysis, it was determined that an instream hardness of 116 mg/L is appropriate for calculating the acute and chronic table value standards that are hardness dependent. The values in Table 8 below are for a warm water aquatic life classification and a hardness of 116 mg/L and are based on the equations in Regulation 32.

Table 8. Outfall 001A - Table Value Standards for Hardness Dependent Metals at
Hardness of 116 mg/L <u>a</u> /

Parameter	In-Stream Water Quality Criteria				
	Acute Criterion	Chronic Criterion			
Cadmium, Dissolved, µg/L	3.14	0.80			
Chromium +3, Dissolved, µg/L	643.42	83.70			
Chromium +6, Dissolved, µg/L	16	11			

Copper, Dissolved, µg/L	15.46	10.17
Lead, Dissolved, µg/L	75.88	2.96
Manganese, Dissolved, µg/L	3,137	152
Nickel, Dissolved, µg/L	530.88	58.96
Selenium, Dissolved, µg/L	18.40	4.60
Silver, Dissolved, µg/L	2.62	0.41
Zinc, Dissolved, µg/L	183.13	138.70

 $\underline{\mathbf{a}}$ Values based on equations from Colorado Regulation 32, Section 32.6(3).

Where WQBELs are calculated, the amount of dilution flow available for the discharge from Outfall 001A is based on the flow data for USGS gaging station 07103780. This flow gage is located approximately 3 miles upstream of the Facility's Monument Creek discharge location. Flow data is available at this gage dating back to 1985, however a period of record used for the gage data was October 2000 - March 2022. Significant population growth occurred upstream of the AFA WWTF after October 2000, data prior to this date is not considered representative of current conditions. It should be noted that there are data gaps in the period of record that include the following times: 11/01/03 thru 03/31/04; 10/01/04 thru 01/09/05; and 10/01/05 thru 03/31/06.

Table 9.	Low Flow	s for Monumen	t Creek at the	USGS Gage	e Station	07103780
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Parameter <u>a</u> /	Annual Low Flow (cfs) <u>b</u> /	Annual Low Flow (MGD)		
1E3	1.16	0.75		
7E3	1.50	0.97		
30E3	2.25	1.45		

a/ 1E3 represents the one-day low flow recurring in a 3-year interval, the annual value is used in acute effluent limitation calculation. 7E3 represents the seven-day low flow recurring in a 3-year interval, the annual value is used in acute effluent limitation calculation. 30E3 represents the 30-

day low flow recurring in a 3-year interval, the annual value is used in the calculation of chronic effluent limitations.

b/ Calculated using DFLOW.

Section 31.10 of Colorado's Basic Standards and Methodologies for Surface Water, Regulation No. 31, require that mixing zones in the receiving waters be considered in determining water quality based effluent limitations. CDPHE's 2015 Water Quality Assessment of Monument Creek did not apply a mixing zone for the development of effluent limitations for AFA WWTF. Per EPA's 2014 issuance of this permit, the slope (i.e., gradient) of Monument Creek is approximately 0.0067 ft./ft. through the area where Outfall 001A discharges into Monument Creek and the width is less than 14ft. Therefore, based on Table I-2 of the Colorado Mixing Zone Guidance, April 2002, the physical mixing zone would be less than the regulatory mixing zone and a mixing zone should not be considered when determining the effluent limitations for the discharge from Outfall 001A.

Table 10 below lists the in-stream background concentrations for parameters for which there is a water quality standard listed in Colorado Regulations 31& 32 and for which sufficient effluent monitoring has been completed over the previous permitting cycle to support reasonable potential analysis. Where monitoring data is sufficient the in-stream background concentrations listed below in Table 10 will be used to calculate a potential WQBEL and a reasonable potential analysis will be completed to evaluate the need for the inclusion of the WQBEL in this permit reissuance. Where effluent monitoring data has been found to be insufficient for a specific parameter to support reasonable potential analysis, a WQBEL will not be calculated at this time and further monitoring will be required in the reissuance of this permit to inform future permitting actions.

Table 10. In-stream Pollutant Background Concentrations for Monument Creek at th	e
USGS Gage Station 07103780	

Parameter	USGS Gage Number	Period of Record	Background Concentration <u>a</u> /
As, Dis (µg/L)		Insufficient Data	
As, TR (µg/L)	07103780	2000-2012	1.7
Cd, Dis (µg/L)	07103970	2000-2022	0.07
Cd, TR (µg/L)		Insufficient Data	
Cr+3, Dis (µg/L)		Insufficient Data	

Cr+3, TR (µg/L)	07103970	2000-2022	0.50
Cr+6, Dis (µg/L)	07103970	2000-2022	0.0001
Cu, Dis (µg/L)	07103780	2000-2012	4.68
Fe, Dis (µg/L)	07103970	2000-2022	50
Fe, TR (µg/L)	07103970	2000-2022	743
Pb, Dis (µg/L)	07103780	2000-2012	0.36
Pb, TR (µg/L)		Insufficient Data	
Mn, Dis (µg/L)	07103780	2000-2012	108
Mo, TR (µg/L)		Insufficient Data	
Hg, Tot (µg/L)	07103970	2000-2022	0.005
Ni, Dis (µg/L)		Insufficient Data	
Ni, TR (µg/L)		Insufficient Data	
Se, Dis (µg/L)	(µg/L) 07103780 2000-2012		0.45
Ag, Dis (µg/L)	07103970	2000-2022	0
Ur, (µg/L)		Insufficient Data	

Zn, Dis (µg/L)	07103780	2000-2012	22	

- <u>a</u>/ Per Colorado's Policy for Characterizing Ambient Water Quality for Use in Determining Water Quality Standards, the following descriptive statistics were used to characterize upstream ambient water quality for use in determining water quality standards based effluent limits:
 - The 85th percentile of the available data for metals with standards that are expressed as the dissolved fraction and all other parameters.
 - The 50th percentile of available data for metals with standards that are expressed as the total or total recoverable fraction

The WQBELs for which dilution is allowed are based on mass balance calculations using the equation given below.

$$M_{2} = \frac{M_{3}Q_{3} - M_{1}Q_{1}}{Q_{2}}$$

Where,

- Q_1 = Upstream low flow (1E3 or 30E3)
- Q_2 = Average daily effluent flow (design capacity)
- Q_3 = Downstream flow ($Q_1 + Q_2$)
- M_1 = In-stream background pollutant concentrations at the existing quality
- M_2 = Calculated WQBEL
- M_3 = Water Quality Standard, or other maximum allowable pollutant concentration.

Where multiple dischargers are found in proximity to one another with shared pollutants of concern, it is the practice of CDPHE to model those facilities together. In a WQBEL calculation, this means that Q2 or the average daily effluent flow is the sum of the design capacities of the facilities being modeled together. Due to their proximity, when determining available assimilative capacities for their shared parameters of concern, the U.S. Air Force Academy WWTF and JD Phillips WRRF (CO-0046850) were modeled together in the calculation of WQBELs. See Tables 11 - 12 below for a summary of WQBEL calculations.

Table 11.	Calculated	Chronic	WQBELs for	Outfall	001A
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Parameter	Q1 (cfs)	Q2 (cfs) <u>a</u> /	Q3 (cfs)	M1	M3	M2
As, Dis (µg/L)			Insuffic	cient Data		

As, TR (µg/L)	2.25	33	35.2	1.7	0.02	10 <u>b</u> /			
Cd, Dis (µg/L)	2.25	33	35.2	0.07	0.8	0.85			
Cd, TR (µg/L)		Insufficient Data							
Cr+3, Dis (µg/L)			Insuffic	cient Data					
Cr+6, Dis (µg/L)	2.25	33	35.2	0.1	11	11.73			
Cu, Dis (µg/L)	2.25	33	35.2	4.68	10.17	10.54			
Fe, Dis (µg/L)	2.25	2.2	4.4	50	300	550.00			
Fe, TR (µg/L)	2.25	33	35.2	743	1000	1017.13			
Pb, Dis (µg/L)	2.25	33	35.2	0.36	2.96	3.13			
Pb, TR (µg/L)			Insuffic	cient Data		I			
Mn, Dis (µg/L)	2.25	2.2	4.4	152	50	152 <u>c</u> /			
Mo, TR Dis (µg/L)			Insuffic	cient Data					
Hg, Tot (µg/L)	2.25	33	35.2	0.005	0.01	0.01			
Ni, Dis (µg/L)		<u>I</u>	Insuffic	cient Data	<u>I</u>				
Ni, TR (µg/L)			Insuffic	cient Data					
Se, Dis (µg/L)	2.25	33	35.2	0.45	4.6	4.88			
Ag, Dis (µg/L)	2.25	33	35.2	0	0.41	0.44			
Ur, (µg/L)			Insuffic	cient Data		I			
Zn, Dis (µg/L)	2.25	33	35.2	22	138.7	146.48			
Nonylphenol (µg/L)	2.25	33	35.2	0	6.6	7.04			
Chloride (mg/L)	2.25	33	35.2	0	250	266.67			
Sulfate (mg/L)	2.25	2.2	4.4	0	250	500.00			
Sulfide (mg/L)	2.25	33	35.2	0	0.002	0.002			

- <u>a</u>/ The design capacity of AFA WWTF is 1.4 MGD or 2.2 CFS. The design capacity of JD Phillips WRRF is 20 MGD or 31 cfs. The combined designed capacities of these facilities, 33cfs, is used in the calculation of WQBELs.
- $\underline{\mathbf{b}}$ / The water quality based effluent limitation for total recoverable arsenic will be set at 10 µg/L based on the following: Footnote 13 of Table III (Metal Parameters) of Regulation No. 31, "The Basic Standards and Methodologies for Surface Waters" specifies "Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number in the range."
- \underline{c} / For a dissolved manganese standard denotation of "WS" the greater of ambient water quality as of January 1, 2000 or 50 µg/L applies. At this time the ambient water quality as of January 1, 2000 will be the standard for dissolved manganese. A standard of 152 µg/L will apply to discharges from AFA WWTF, Outfall 001A

ACUTE	Q1	Q2 <u>a</u> /	Q3	M1	M3	M2	
As, Dis (µg/L)			Insuffic	cient Data	1		
Cd, Dis (µg/L)	1.16	33	34.16	0.07	3.15	3.26	
Cd, TR (µg/L)		1	Insuffic	cient Data			
Cr+3, Dis (µg/L)			Insuffic	cient Data			
Cr+6, Dis (µg/L)	1.16	33	34.16	0.1	16	16.56	
Cu, Dis (µg/L)	1.16	33	34.16	4.68	15.45	15.83	
Pb, Dis (µg/L)	1.16	33	34.16	0.36	75.88	78.53	
Pb, TR (µg/L)			Insuffic	cient Data			
Mn, Dis (µg/L)	1.16	33	34.16	152	3317	3428.25	
Mo, TR Dis (µg/L)		Insufficient Data					
Ni, Dis (µg/L)		Insufficient Data					
Se, Dis (µg/L)	1.16	33	34.16	0.45	18.4	19.03	
Ag, Dis (µg/L)	1.16	33	34.16	0	2.64	2.73	

Table 12. Calculated Acute WQBELs for Outfall 001A

Ur, (µg/L)	Insufficient Data						
Zn, Dis (µg/L)	1.16	33	34.16	22	183.13	188.79	
Nonylphenol (µg/L)	1.16	33	35.2	0	28	29.87	
Cyanide (mg/L)	1.16	33	35.2	0.01	5	5.33	
Total Inorganic Nitrogen (T.I.N.), mg/L	0.03	11.4	11.4	0	13	13.00	

a/ The design capacity of AFA WWTF is 1.4 MGD or 2.2 CFS. The design capacity of JD Phillips WRRF is 20 MGD or 31 cfs. The combined designed capacities of these facilities, 33cfs, is used in the calculation of WQBELs.

b/ The 2015 iteration of the Tri-Lakes WQA modeled the Tri-Lakes WWTF, Upper Monument Creek Regional WWTF, and the U.S. Air Force Academy WWTF together for the T.I.N. WQBEL development because these facilities are all upstream of the drinking water intake on Monument Creek. Therefore, the low flow Q1 represents the low flow of the most upstream facility, data was sourced from USGS Gage 07103755. Q2 is the combined design capacities of these facilities.

Much of the time the only water going into NPR#1 is the discharge from the WWTF via Outfall 001B, surface runoff, and well water during the irrigation season. Therefore, the quality of water in NPR#1 is assumed to be variable and highly dependent on the relative proportions of water from the WWTF, the wells, and surface runoff. For pollutants of potential concern, the quality is likely poorest when the proportion of water from the WWTF is the greatest. Therefore, the determination of WQBELs and reasonable potential for Outfall 001B is based on the conclusion that water quality standards must be met without consideration of dilution, as they appear in Colorado Regulations 31& 32 for Fountain Creek Segment 11, except for where those regulations call for the calculation of a hardness based table value standard.

The water quality criteria for some of the table value standards (TVS) for metals are based on hardness and the equations can be found in Table III, Metal Parameters, of CDPHE Water Quality Control Commission Regulation No. 31, "The Basic Standards and Methodologies for Surface Water", effective January 1, 2012. They are also found in section 32.6(3) of Regulation No. 32, "Classifications and Water Quality Standards for Arkansas River Basin." A hardness of 150 mg/L as calcium carbonate was used in the calculations and the resulting values are shown below in Table 13. The 150 mg/L hardness value is based on the information submitted to EPA in the permit renewal application.

Table 13. Outfall 001B - Table Value Standards for Hardness Dependent Metals at
Hardness of 150 mg/L

Parameter	In-Stream Water Quality Criteria

	Acute Criterion	Chronic Criterion
Cadmium, Dissolved, µg/L	4.0	0.97
Chromium +3, Dissolved, µg/L	794	103
Chromium +6, Dissolved, µg/L	16	11
Copper, Dissolved, µg/L	19.7	12.7
Lead, Dissolved, µg/L	100	3.9
Manganese, Dissolved, µg/L	3417	50
Nickel, Dissolved, µg/L	660	73
Selenium, Dissolved, µg/L	18.4	4.6
Silver, Dissolved, µg/L	4.08	0.64
Zinc, Dissolved, µg/L	231	175

<u>**a**</u>/ Values based on equations from Colorado Regulation 32, Section 32.6(3).

6.2.2 Physical and Biological

6.2.2.1 pH

pH limits are established for each water segment by Colorado Regulation No. 32. Regarding Segment 6 and Segment 11 of Fountain Creek, Regulation No. 32 requires that the pH of discharge shall not be less than 6.5 or greater than 9.0 at any time. This limitation was applied at both Outfall 001B and 001A in the previous permit and will be maintained in the reissuance.

6.2.2.2 E. Coli

The Colorado State WQS Standards for *E. coli* has been developed for individual water segments. As stated in Table 7b above, the relevant limitation for Fountain Creek Segments 6

and 11 is 126 no./ per 100 mL, expressed in Colorado Reg. 32 as a two-month geometric mean. Accordingly, the 30-day average (geometric mean) effluent limitation for *E. coli* will be the same as the water quality criterion of 126 organisms/100 mL.

Per Colorado Regulation No. 93, Segment 6 of Monument Creek is on Colorado's 303(d) list of impaired waters and monitoring and evaluation list. The listing is for impairment for *E. coli* from May through October. In response to listing, the previous permit contained the following limitation in addition to the monthly geometric mean: "in accordance with the WQCD practice, the 7-day average limitation will be 252 organisms/100 mL." This limitation will be maintained in this permit reissuance.

6.2.2.3 *Temperature*

In 2007 and 2010 the Water Quality Control Commission developed detailed water quality criteria for temperature, which are given in Table 1 of Section 31.16 of Regulation 31. Prior to then, temperature criteria had not been included in the Arkansas River Basin (Regulation 32). The August 2013 changes to Regulation 32 included assigning temperature standards for most segments, with the changes effective December 31, 2013. For Fountain Creek segment 6 the temperature criterion is T=TVS(WS-II) °C. For the new Fountain Creek segment 11 the temperature criterion is T=TVS(WL) °C.

Table 14 below shows the temperature classifications for the two stream segments, the months the summer and winter criteria apply, the summer and winter criteria, and the maximum effluent temperatures observed during the period of February 2015 to October 2021. Because the same effluent flows through Outfalls 001A and 001B, data from both outfalls was considered when evaluating whether there is a reasonable potential to exceed the appliable temperature standards. Available temperature data indicate that the maximum temperature observed at Outfall 001B exceeds the Maximum Weekly Average Temperature (MWAT) standards for both outfalls during the months of December to February at Outfall 001A and the months of January to March at Outfall 001B indicating that there is reasonable potential for temperature standards exceedance during these timeframes. Therefore, temperature limits will be added to this permit for the months of December to February at Outfall 001A and the months of January to March at Outfall 001B. Year-round monitoring requirements will remain in place.

Table 14. Receiving Water Temperature Standards

Outfall	Temperature Classification <u>a</u> /	Applicable Months	Temperature	Maximum Temperature
			MWAT <u>b</u> / (°C)	DM <u>c</u> / (°C)

001A	T=TVS(WS-II)	March-Nov.	27.5	28.6	18.6
		DecFeb.	13.8	25.2	10.0
001B	T=TVS(WL)	April-Dec.	26.5	29.3	25.1 <u>e</u> /
		JanMarch	13.1	24.1	17.2

 $\underline{\mathbf{a}}$ / Based on applicable classifications for the Arkansas River Basin (Regulation 32) effective 12/31/2021.

- **b**/ Maximum Weekly Average Temperature (MWAT). The MWAT is calculated as the largest mathematical mean of multiple, equally spaced temperatures over a seven-day consecutive period, with a minimum of three data points spaced equally through the day.
- **c**/ Daily Maximum Temperature (DM). The DM means the highest two-hour average temperature recorded during a given 24-hour period. The daily maximum should be calculated from a minimum of 12 measurements spaced equally through the day.
- $\underline{\mathbf{d}}$ Maximum temperature observed at the WWTF for the applicable months based on daily grab samples for the period of February 2015 October 2021.
- $\underline{\mathbf{e}}$ / Reported 70 on August 2015 DMR appears to be error; reported 0.0012 on July 2015 DMR appears to be an error. These values are not included in the data presented.

6.2.3 Inorganics

6.2.3.1 Ammonia

Ammonia limitations for AFA WWTF Outfall 001A included in the 2014 permit issuance were referenced from the 2011 Tri-Lakes water quality assessment (WQA). This permit issuance will apply limits developed using CDPHE's Ammonia Toxicity (AMMTOX) Model. Per available guidance on the use of the AMMTOX Model, modeling included the discharges from facilities in proximity to the AFA WWTF including the Tri-Lakes WWTF (CO-0020435), the Upper Monument Creek WWTF (CO0042030), and the JD Phillips WRRF (CO-0046850). Chronic and acute effluent limitations were calculated for the discharges from the five WWTFs, resultant limits for AFA WWTF Outfall 001A are given below in Table 15.

	Chronic WQBEL	Acute WQBEL		
Month	30-Day Avg.	Daily Max.		
January	4.3	8.0		
February	6.0	8.0		
March	6.0	9.4		
April	9.0	12		
May	9.5	20		
June	9.7	22		
July	9.5	24		
August	9.3	24		
September	8.8	20		
October	8.5	12		
November	5.9	8.2		
December	4.9	7.3		

Table 15. Water Quality Based Effluent Limitations for Ammonia-N for Outfall 001A, mg/L

Per the previous permit issuance Outfall 001B ammonia limitations are based on the WQBELs for ammonia given in the CDPS General Permit COG-589000, effective October 1, 2013 and set to expire on September 30, 2018. CDPHE's website indicates that a renewal for this permit will be drafted in 2022. This general permit is for domestic wastewater treatment facilities that discharge to receiving waters that are: unclassified; use protected; reviewable; or are designated for threatened and endangered species. According to the fact sheet for the general permit, the AMMTOX model was used for various dilution ratios of the receiving waters to determine

WQBELs for ammonia. The ammonia limitations for Outfall 001B, based on zero dilution, were taken from Tables 6d and 6e of the general permit and are listed below in Table 16.

Table 16. Water Quality Based Effluent Limitations for Ammonia-N for Outfall 001B, mg/L

	Chronic WQBEL <u>a</u> /	Acute WQBEL <u>b</u> /
Month	30-Day Avg.	Daily Max.
January	5.1	13
February	4.7	11
March	3.2	7.3
April	1.9	6.1
May	2.4	7.9
June	3.0	10
July	2.3	9.7
August	1.9	7.9
September	2.3	8.7
October	3.4	11
November	3.7	11
December	3.7	8.9

<u>a</u>/ Based on Table 6d, "Monthly Chronic Total Ammonia WQBEL for Warm Water Classified Streams (mg/L)," from CDPS General Permit COG-589000. The values are for zero (0) dilution ratio.

b/ Based on Table 6e, "Monthly Acute Total Ammonia WQBEL for Warm Water Classified Streams (mg/L)," from CDPS General Permit COG-589000. The values are for zero (0) dilution ratio.

6.2.3.2 Nutrients

The Water Quality Control Commission on June 11, 2012, adopted Regulation No. 85, Nutrients Management Control Regulation, with an effective date of September 30, 2012. Section 85.5 includes specific limitations for dischargers of total inorganic nitrogen and total phosphorus, which are to be implemented in permits no sooner than July 1, 2013. The effluent limitations are not to be included into permits for domestic wastewater treatment works (DWWTW) for any existing permitted DWWTW with a design capacity of less than or equal to 2.0 million gallons per day prior to December 31, 2027.

Since the AFA WWTF has an approved design capacity of 1.4 million gallons per day, the effluent limitations based on Regulation No. 85 will not be considered for this permit. However, monitoring for total nitrogen and total phosphorus will be included in this permit as these analytes are still consider pollutants of concern for facilities treating domestic waste.

An acute nitrate standard of 10 mg/L is assigned to Fountain Creek Segment 6. Because nitrite and ammonia can also form nitrate, compliance with the nitrate standard is achieved through imposition of a Total Inorganic Nitrogen (T.I.N.) limit. T.I.N. effectively measures nitrate and its precursors including nitrite and ammonia. The previous issuance of this permit applied the T.I.N. limit developed in the 2011 Tri- Lakes WQA. The 2015 iteration of the Tri-Lakes WQA also contains T.I.N. limitations for Fountain Creek Segment 6. The Tri-Lakes WWTF, Upper Monument Creek Regional WWTF, and the U.S. Air Force Academy WWTF were modeled together for this parameter since the drinking water source is downstream of the U.S. Air Force Academy WWTF's Monument Creek discharge location. This approach was applied in this permit to the calculation of T.I.N. WQBEL for Monument Creek Segment 6, a daily max of 13 mg/L – See Table 12.

6.2.3.3 Sulfate and Sulfide

Colorado Regulation 32 defines segment specific water quality standards for sulfate and sulfide. Both Fountain Creek Segment 6 and Segment 11 have a chronic sulfate limitation of 250 mg/L per the water supply standards of Colorado Regulation 31. However, while Fountain Creek Segment 6 has a chronic water quality standard for sulfide of 0.002 mg/L, Fountain Creek Segment 11 has no sulfide standard.

Discharges from AFA WWTF to Fountain Creek Segment 6 via Outfall 001A are subject to WQBEL calculation with consideration for dilution, see Table 11 above. As such a chronic sulfate effluent limitation of 500 mg/L and a chronic sulfide limitation of 0.002 mg/L would be applied to discharges from Outfall 001A, if the results of reasonable potential analysis determined that an effluent limitation is appropriate for this parameter.

As discussed in Section 6.2.2. above, discharges to NPR#1 via Outfall 001B are not subject to dilution considerations, if effluent limitations for sulfate are found to be appropriate after a reasonable potential analysis is completed, the water quality standards would be applied as they

appear in Regulation 32. Because there is typically no other flow into NPR #1 other than discharge from the AFA WWTF, the results in Table 18 & 19 below do not consider mixing, therefore for Outfall 001B the receiving water concentration is assumed to be equal to the projected maximum effluent concentration.

The reasonable potential analysis results for sulfate and sulfide are given below in Tables 17 - 19 along with the potential effluent limitations for Outfalls 001A and 001B.

Parameter	Calculated WQBELs		Receiving Water Concentration <u>a</u> /		Projected Maximum	Reasonable Potential
	Acute	Chronic	Acute	Chronic	Effluent Concentration	Determination
Sulfate (mg/L)	N/A	500		22	44	No
Sulfide (mg/L)	N/A	0.002		40	89	<u>a</u> /

Table 17. Outfall 001A - Reasonable Potential Analysis for Sulfate and Sulfide

a/ Results are based on 6 data points. Data collected from Outfall 001B was determined to be representative of the quality of discharge from Outfall 001A where sample numbers from Outfall 001A lower. Data from Outfall 001B corroborates the conclusions of the reasonable potential analysis above – See Table 18 below.

Table 18. Outfall 001B - Reasonable Potential Analysis for Sulfate

Parameter	Water Quali from Colorad 32 &	ty Standards lo Regulations & 31	Projected Effluent Co	Reasonable Potential	
	Acute	Chronic	Acute	Chronic	Determination
Sulfate (mg/L)	N/A	250		120	No

Based on the results in Tables 17 -18 it appears that there is not reasonable potential for the chronic WQBELs for sulfate to be exceeded at either outfall. Therefore, no effluent limitations for sulfate will be included in the permit for discharges at Outfall 001A or 001B. Additionally, since the projected maximum concentration of sulfate is less than 50% of the WQBELs, monitoring for sulfate will not be required for discharges from either Outfall 001A or 001B.

At the time of permit drafting the AFA WWTF had reported 6 sulfide effluent monitoring data points from Outfall 001A. The Facility reported 30 sulfide effluent monitoring data points from Outfall 001B at the time of permit drafting. Because discharge from both outfalls undergo the same treatment process and originate from the same sources, it was determined that data from Outfall 001B could be considered representative of the quality of discharge from Outfall 001A where sample numbers were lower. See sulfide data from Outfall 001B in Table 19 below.

Table 19. Outfall 001B – Data Used to Corroborate Conclusions of RPA for Sulfide at Outfall 001A

Parameter	Calculated WQBELs		Receiving Water Concentration		Projected Maximum	Reasonable Potential	
	Acute	Chronic	Acute	Chronic	Concentration	Determination	
Sulfide (mg/L)	N/A	0.0022		15	32	Yes	

The results in Tables 17 & 19 above appear to indicate that there is reasonable potential for the facility to exceed the Fountain Creek Segment 6 chronic water quality standard for sulfide. As seen in Table 19, a review of sulfide monitoring data collected at Outfall 001B corroborates this conclusion. A chronic sulfide limitation of 0.0022 mg/L will be applied at Outfall 001A in this permit issuance and sulfide monitoring requirements established in the previous permit issuance will be maintained at Outfall 001B.

6.2.3.4 Total Residual Chlorine and Chloride

The previous permit stated that a 30-Day Average limit of .011 mg/L and a Daily Maximum of .019 mg/L apply when the Facility's chlorination system is used. At all other times, when the Ultraviolet (UV) disinfection system is used, the Facility was required to report "N/A" to the TRC field on the Discharge Monitoring Report (DMR). This issuance will maintain these TRC limits at both Outfall 001A and 001B.

Colorado Regulation 32 defines segment specific water quality standards for chloride. Both Fountain Creek Segment 6 and Segment 11 have a chronic chloride limitation of 250 mg/L. Discharges from AFA WWTF to Fountain Creek Segment 6 via Outfall 001A are subject to WQBEL calculation with consideration for dilution, see Table 11 above. As such a chronic effluent limitation of 267 mg/L would be applied to discharges from Outfall 001A, if the results of reasonable potential analysis determined that an effluent limitation is appropriate for this parameter.

As discussed in Section 6.2.2. above, discharges to NPR#1 via Outfall 001B are not subject to dilution considerations, if effluent limitations for chloride are found to be appropriate after a

reasonable potential analysis is completed, the water quality standards would be applied as they appear in Regulation 32. Because there is typically no other flow into NPR #1 other than discharge from the AFA WWTF, the results in Table 20 below do not consider mixing, therefore for Outfall 001B the receiving water concentration is assumed to be equal to the projected maximum effluent concentration.

At the time of permit drafting the AFA WWTF reported 9 chloride data points from Outfall 001A effluent monitoring. The Facility also reported 79 chloride monitoring data points from Outfall 001B. Because discharge from both outfalls undergo the same treatment process and originate from the same sources, it was determined that data from Outfall 001B could be considered representative of the quality of discharge from Outfall 001A where sample numbers were lower.

The reasonable potential analysis results for Chloride are given below in Table 20 along with the potential effluent limitation for Outfalls 001A and 001B.

Discharge Location	Relevant Water Star	WQBEL or · Quality ndard	QBEL or lality rdReceiving Water Concentration		Projected Maximum Effluent	Reasonable Potential Determination
	Acute	Chronic	Acute	Chronic	Concentration	
Outfall 001A	N/A	267		69	140	Monitoring Required
Outfall 001B	N/A	250			150	Monitoring Required

Table 20. Outfalls 001A & 001B – Reasonable Potential Analysis for Chloride

Based on the results in Table 20, it appears that there is not a reasonable potential for the chronic WQBELs for chloride to be exceeded at either outfall. Therefore, no effluent limitations for chloride will be included in the permit for discharges at Outfall 001A or 001B. However, since the projected maximum concentration of chloride is greater than 50% of the WQBELs, monitoring will be required for discharges from both Outfall 001A and 001B.

6.2.3.5 *Cyanide*

It is the CDPHE's standard procedure to consider metals and cyanide as potential pollutants of concern for all major domestic WWTFs. Colorado Regulation 32 defines segment specific water quality standards for cyanide. Both Fountain Creek Segment 6 and Segment 11 have an acute cyanide limitation of .005 mg/L or $5 \mu g/L$.

Discharges from AFA WWTF to Fountain Creek Segment 6 via Outfall 001A are subject to WQBEL calculation with consideration for dilution, see Table 12 above. As such a chronic effluent limitation of $5.3 \mu g/L$ would be applied to discharges from Outfall 001A, if the results of

reasonable potential analysis determine that an effluent limitation is appropriate for this parameter.

As discussed in Section 6.2.2. above, discharges to NPR#1 via Outfall 001B are not subject to dilution considerations, if effluent limitations for chloride are found to be appropriate after a reasonable potential analysis is completed, the water quality standards would be applied as they appear in Regulation 32. Because there is typically no other flow into NPR #1 other than discharge from the AFA WWTF, the results in Table 21 below do not consider mixing, therefore for Outfall 001B the receiving water concentration is assumed to be equal to the projected maximum effluent concentration.

At the time of permit drafting the AFA WWTF reported 4 cyanide data points were available from Outfall 001A effluent monitoring. Twenty-five cyanide sampling data points were available from Outfall 001B effluent monitoring. Because discharge from both Outfalls undergo the same treatment process and originate from the same sources, it was determined that data from Outfall 001B could be considered representative of the quality of discharge from Outfall 001A where sample numbers were lower.

The reasonable potential analysis results for cyanide are given below in Table 21 along with the potential effluent limitation for Outfalls 001A and 001B.

Parameter	Relevant WQBEL or Water Quality Standard		Receiving Water Concentration		Projected Maximum Effluent	Reasonable Potential	
	Acute (µg/L)	Chronic (µg/L)	Acute (µg/L)	Chronic (µg/L)	Concentration	Determination	
Outfall 001A	5.3	N/A	19		34	Yes	
Outfall 001B	5.0	N/A			200	Yes	

Table 21. Outfalls 001A & 001B – Reasonable Potential Analysis for Cyanide

The results in Tables 21 above appear to indicate that there is reasonable potential for the facility to exceed the acute WQBELs for cyanide at both Outfall 001A and 001B. Acute cyanide limitations as listed in Table 21 will apply at each corresponding outfall.

6.2.4 Organic Chemicals - Nonylphenol

The Colorado Water Quality Control Commission made the effluent criteria for nonylphenol effective January 1, 2011, "with the understanding that the normal permitting process would be followed. Effluent limits would not normally be imposed during the first round of permit renewals, but monitoring would be required as a first step." The previous permit required monitoring for nonylphenol at both Outfall 001A and 001B. Colorado Regulation 31 includes both acute and chronic aquatic life base standards for nonylphenol of $28 \mu g/L \& 6.6 \mu g/L$ respectively.

Discharges from AFA WWTF to Fountain Creek Segment 6 via Outfall 001A are subject to WQBEL calculation with consideration of dilution, see Tables 11 & 12 above. As such a chronic effluent limitation of 29.5 μ g/L and an acute effluent limitation of 6.6 μ g/L would be applied to discharges from Outfall 001A, if the results of reasonable potential analysis determine that an effluent limitation is appropriate for this parameter.

As discussed in Section 6.2.2. above, discharges to NPR#1 via Outfall 001B are not subject to dilution considerations, if effluent limitations for nonylphenol are found to be appropriate after a reasonable potential analysis is completed, the water quality standards would be applied as they appear in Regulation 31. Because there is typically no other flow into NPR #1 other than discharge from the AFA WWTF, the results in Table 22 below do not consider mixing, therefore for Outfall 001B the receiving water concentration is assumed to be equal to the projected maximum effluent concentration.

At the time of permit drafting the AFA WWTF reported 2 nonylphenol data points were available from Outfall 001A effluent monitoring. Thirteen nonylphenol sampling data points were available from Outfall 001B effluent monitoring. Because discharge from both outfalls undergo the same treatment process and originate from the same sources, it was determined that data from Outfall 001B could be considered representative of the quality of discharge from Outfall 001A where sample numbers were lower.

The reasonable potential analysis results for nonylphenol are given below in Table 22 along with the potential effluent limitation for Outfalls 001A and 001B.

Parameter	Relevant WQBEL or Water Quality Standard		Receiving Water Concentration		Projected Maximum Effluent	Reasonable Potential Determination
	Acute (µg/L)	Chronic (µg/L)	Acute (µg/L)	Chronic (µg/L)	Concentration	Determination
Outfall 001A	29.87	7.04			4.8	Monitoring Required

Table 22. Outfalls 001A & 001B – Summary of Reasonable Potential Analysis for Nonylphenol

Outfall 001B	28	6.6			5.4	Monitoring Required
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Based on the results in Table 22, it appears that there is not a reasonable potential for nonylphenol WQBELs to be exceeded at either outfall. Therefore, no effluent limitations for nonylphenol will be included in the permit for discharges at Outfall 001A or 001B. However, since the projected maximum concentration of nonylphenol is greater than 50% of the WQBELs, monitoring will be required for discharges from both Outfall 001A and 001B.

6.2.5 Metals

6.2.5.1 Outfall 001A Reasonable Potential Analysis

Discharges from AFA WWTF to Fountain Creek Segment 6 via Outfall 001A are subject to WQBEL calculation, see Tables 11 &12 above. As such the calculated effluent limitations in Tables 11 & 12 above and Table 23 below would be applied to discharges from Outfall 001A, if the results of reasonable potential analysis determine that an effluent limitation is appropriate for this parameter.

Parameter	WQBELs		Receiving Water Concentration		Projected Maximum Effluent	Number of	Reasonable Detential?
	Acute	Chronic	Acute	Chronic	Concentration	Samples	i otentiai.
As, Dis (µg/L)	<u>a</u> /	N/A				0	Not Enough Data <u>a</u> /
As, TR (µg/L)	N/A	10		3.7	6.1	6	Not Enough Data <u>b</u> /
Cd, Dis (µg/L)	3.26	0.85			1.0	2	Not Enough Data <u>b</u> /
Cd, TR (µg/L)	<u>a</u> /	N/A				0	Not Enough Data <u>a</u> /

Table 23. Outfall 001A - Reasonable Potential Analysis for Metals

Cr+3, Dis (µg/L)	N/A	<u>a</u> /				0	Not Enough Data <u>a</u> /
Cr+3, TR (µg/L)	<u>a</u> /	N/A				0	Not Enough Data <u>a</u> /
Cr+6, Dis (µg/L)	16.56	11.73	24	18	37	3	Not Enough Data <u>b</u> /
Cu, Dis (µg/L)	15.83	10.54	11.0	9.8	15	8	Not Enough Data <u>b</u> /
Fe, Dis (µg/L)	N/A	550		210	370	9	Not Enough Data <u>b</u> /
Fe, TR (µg/L)	N/A	1017.13		510	390	9	Not Enough Data <u>b</u> /
Pb, Dis (μg/L)	78.53	3.13	2.9	3.7	4.2	6	Not Enough Data <u>b</u> /
Pb, TR (µg/L)	<u>a</u> /	N/A				0	Not Enough Data. <u>a</u> /
Mn, Dis (µg/L)	3,428.25	152 c/	290	260	390	9	Not Enough Data <u>b</u> /
Mo, TR Dis (µg/L)	N/A	<u>a</u> /				0	Not Enough Data <u>a</u> /
Hg, Tot (µg/L)	N/A	0.010		.039	.071	9	Not Enough Data <u>b</u> /
Ni, Dis (µg/L)	<u>a</u> /	<u>a</u> /				0	Not Enough Data <u>a</u> /

Ni, TR (µg/L)	N/A	<u>a</u> /	 		0	Not Enough Data <u>a</u> /
Se, Dis (µg/L)	19.03	4.88	 	2	1	Not Enough Data <u>b</u> /
Ag, Dis (µg/L)	2.73	0.44	 	0.4	2	Not Enough Data <u>b</u> /
Ur, (µg/L)	<u>a</u> /	<u>a</u> /	 		0	Not Enough Data <u>a</u> /
Zn, Dis (µg/L)	188.79	146.48	 	180	2	Not Enough Data <u>b</u> /

- <u>a</u>/ Parameter not included in monitoring requirements from previous permit issuance. Data not available for reasonable potential analysis. Reasonable potential analysis and any subsequent WQBEL implementation will occur at a later date when monitoring data is available for this parameter.
- **b**/ Insufficient data from previous permitting cycle per CDPHE guidance on reasonable potential analysis. If sufficient data for this parameter has been collected at Outfall 001B to complete the analysis, a reasonable potential determination will be made with respect to those results.
- \underline{c} / The water quality standards provide that for the water supply classification, the less restrictive of either the numerical standard for dissolved manganese (50 µg/L) or the existing quality as of January 1, 2000 shall apply. Analysis of water quality data at USGS gage 07103780 determined that the appropriate manganese limitation is 152 µg/L.

6.2.5.2 Outfall 001B Reasonable Potential Analysis

As discussed in Section 6.2.2. above, discharges to NPR#1 via Outfall 001B are not subject to dilution considerations, if effluent limitations for nonylphenol are found to be appropriate after a reasonable potential analysis is completed, the water quality standards would be applied as they appear in Regulation 31. Because there is typically no other flow into NPR #1 other than discharge from the AFA WWTF, the results in Table 24 below do not consider mixing, therefore for Outfall 001B the receiving water concentration is assumed to be equal to the projected maximum effluent concentration.

Table 24. Outfall 001B - Reasonable Potential Analysis for Metals

Parameter	Water Quali from Colorad 32 &	ty Standards lo Regulations & 31	Projected Maximum Effluent	Number of Samples	Reasonable Potential?
	Acute	Chronic	Concentration		
As, Dis (µg/L)	340	N/A		0	Not Enough Data <u>a</u> /
As, TR (µg/L)	N/A	10	4.6	33	No
Cd, Dis (µg/L)	4.00	0.97	15	15	Yes
Cd, TR (µg/L)	5.0	N/A		0	Not Enough Data <u>a</u> /
Cr+3, Dis (µg/L)	NA	103		0	Not Enough Data <u>a</u> /
Cr+3, TR (µg/L)	50	N/A		0	Not Enough Data <u>a</u> /
Cr+6, Dis (µg/L)	16	11	31	22	Yes
Cu, Dis (µg/L)	19.7	12.7	150	68	Yes
Fe, Dis (µg/L)	N/A	300	310	78	Yes
Fe, TR (µg/L)	N/A	1000	1000	79	No
Pb, Dis (µg/L)	100	3.9	2.8	32	No
Pb, TR (µg/L)	50	N/A		0	Not Enough Data <u>a</u> /
Mn, Dis (µg/L)	3417	50 b/	510	79	Yes

Mo, TR Dis (µg/L)	N/A	150		0	Not Enough Data <u>a</u> /
Hg, Tot (µg/L)	N/A	0.01	0.032	77	Yes
Ni, Dis (µg/L)	660	73		0	Not Enough Data <u>a</u> /
Ni, TR (µg/L)	N/A	100		0	Not Enough Data <u>a</u> /
Se, Dis (µg/L)	18.4	0.64	660	7	Not Enough Data
Ag, Dis (µg/L)	4.08	0.64	0.59	14	No
Ur (µg/L)	N/A	30		0	Not Enough Data <u>a</u> /
Zinc, Dis, (µg/L)	231	175	430	19	Yes

 $\underline{\mathbf{a}}$ Parameter not included in monitoring requirements from previous permit issuance. Data not available for reasonable potential analysis.

 $\underline{\mathbf{b}}$ / The water quality standards provide that for the water supply classification, the less restrictive of either the numerical standard for dissolved manganese (50 µg/L) or the existing quality as of January 1, 2000 shall apply. The water quality of NPR #1 is variable and likely dominated by the relative proportions of water from the WWTF, irrigation wells, and surface runoff, therefore existing quality was not factored into the determination of this limit.

6.2.5.3 Metals - Determination of Effluent Limitations and Monitoring Requirements

Table 25 below summarizes the results of the reasonable potential analysis for metals which have a water quality standard listed in Colorado Regulation 31& 32.

At the time of permit drafting the AFA WWTF there was a large disparity in the number of samples from each outfall available for analysis. Because discharge from both outfalls undergo the same treatment process and originate from the same sources, it was determined that data from Outfall 001B could be considered representative of the quality of discharge from Outfall 001A where sample numbers were lower. This assumption guided the interpretation of results from the reasonable potential analysis below.

Table 25. Outfalls 001A & 001B – Summary of Reasonable Potential Analysis for Metals

Parameter	Reasonable Potential for Outfall 001A Data	Reasonable Potential from Outfall 001B Data	Reasonable Potential Determination
As, Dis (µg/L)	No Data Available	No Data Available	Monitoring Required
As, TR (µg/L)	MEC <u>a</u> / > 50% of WQBEL	No RP found	Monitoring Require
Cd, Dis (µg/L)	MEC > 50% of WQBEL	RP Found	Limits Required
Cd, TR (µg/L)	No Data Available	No Data Available	Monitoring Required
Cr+3, Dis (µg/L)	No Data Available	No Data Available	Monitoring Required
Cr+3, TR (µg/L)	No Data Available	No Data Available	Monitoring Required
Cr+6, Dis (µg/L)	RP Found	RP Found	Limits Required
Cu, Dis (µg/L)	MEC > 50% of WQBEL	RP Found	Limits Required
Fe, Dis (µg/L)	MEC > 50% of WQBEL	RP Found	Limits Required
Fe, TR (µg/L)	MEC > 50% of WQBEL	MEC > 50% of WQBEL	Monitoring Required
Pb, Dis (µg/L)	MEC > 50% of WQBEL.	MEC > 50% of WQBEL.	Monitoring Required.

Pb, TR (µg/L)	No Data Available	No Data Available	Monitoring Required
Mn, Dis (µg/L)	RP Found	RP Found	Limits Required
Mo, TR Dis (µg/L)	No Data Available	No Data Available	Monitoring Required
Hg, Tot (µg/L)	RP Found	RP Found	Limits Required
Ni, Dis (µg/L)	No Data Available	No Data Available	Monitoring Required
Ni, TR (µg/L)	No Data Available	No Data Available	Monitoring Required
Se, Dis (µg/L)	No RP Found	MEC > 50% of WQBEL	Monitoring Required
Ag, Dis (µg/L)	MEC > 50% of WQBEL	MEC > 50% of WQBEL	Monitoring Required
Ur, (µg/L)	No Data Available	No Data Available	Monitoring Required
Zn, Dis (µg/L)	MEC > 50% of WQBEL	RP Found	Limits Required

<u>a</u>/ MEC = Maximum projected Effluent Concentration. Calculated from the maximum reported effluent concentration multiplied by the pollutant specific multiplier found in Table 3-1 of EPA's Technical Support Document for Water Quality-based Toxics Control

6.2.6 Whole Effluent Toxicity (WET)

Many toxic pollutants have cumulative effects on aquatic organisms that cannot be detected by individual chemical testing. However, laboratory tests can measure toxicity directly by exposing

living organisms to the wastewater and measuring their responses. Because these tests measure the aggregate toxicity of the whole effluent, this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Due to the nature of discharge from AFA WWTF, WET monitoring is required to ensure that narrative standards for toxics, per the State's narrative water quality standard in Colorado Regulation 31.11(1), are not violated. Therefore, the requirement to perform chronic WET testing will be maintained in this Permit. Section 101(a)(3) of the CWA states, "it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited." Chronic WET testing shall be performed at least annually by the Permittee for two species: *Ceriodaphnia dubia* and *Pimephales promelas*. Both species are required to be tested during a routine chronic toxicity test. The following minimum dilution series should be used: 100%, 50%, 25%, 12.5%, 6.25% and a 0% control. In the event chronic toxicity is found in the effluent, a Toxicity Identification/Toxicity Reduction Evaluation (TIE/TRE) will be required. Specific WET requirements are outlined in the Special Conditions section of the Permit (see section 5.1 of the Permit).

The previous permit applied the state method of calculating an instream waste concentration which included dilution, based on facility design flow and receiving stream chronic low flow. In order to better align this issuance with current EPA Region 8 WET policy, this permit will require that there be no whole effluent toxicity at 100% effluent concentration at Outfall 001A. Likewise, the permit will require that there be no chronic whole effluent toxicity at 100% effluent at Outfall 001B – this requirement is unchanged from the previous issuance. Chronic toxicity is considered present in the effluent when a chronic WET test demonstrates that one (or both) of the two statistical test endpoints, either the No Observed Effect Concentration (NOEC) or the inhibition concentration (IC25), are at any effluent concentration less than the IWC.

6.3 Final Effluent Limitations

Applicable TBELs and WQBELs were compared, and the most stringent of the two was selected for the following effluent limits (Table 26).

Effluent Characteristic	30-Day Average Effluent Limitations a/	7-Day Average Effluent Limitations a/	Daily Maximum Effluent Limitations a/	Limit Basis b/
Flow (mgd)	1.4	N/A	report only	PP
Carbonaceous Biochemical Oxygen Demand (CBOD5) (mg/L)	25	40	N/A	TBEL

Carbonaceous Biochemical Oxygen Demand (CBOD5) Percent Removal (%) c/	85%	N/A	N/A	TBEL
Total Suspended Solids (TSS) (mg/L)	30	45	N/A	TBEL
Total Suspended Solids (TSS) Percent Removal (%) <u>c/</u>	85%	N/A	N/A	TBEL
рН	Must remai	n in the range of 6 <i>times</i> .	5.5 to 9.0 <i>at all</i>	WQBEL
Oil and Grease (O&G) (mg/L)	The concer single san	ntration of oil and apple shall not exce	grease in any eed 10 mg/L.	TBEL
<i>Escherichia coli (E. coli)</i> , number/100 mL <u>d</u> /	126	252	N/A	WQBEL
Total Inorganic Nitrogen (T.I.N.), mg/L	N/A	N/A	13	WQBEL
Temperature, °C (DecFeb.)	N/A	13.8	25.2 <u>a</u> /	WQBEL
Total Ammonia (mg/L)		WQBEL		
Total Residual Chlorine (mg/L) <u>e</u> /	0.011	N/A	0.019	WQBEL
Cyanide (µg/L)	N/A	N/A	5.33	WQBEL
Sulfide (mg/L)	0.002	N/A	N/A	WQBEL
Cd, Dis (µg/L)	0.85	N/A	3.26	WQBEL
Cr+6, Dis (µg/L)	11.73	N/A	16.56	WQBEL
Cu, Dis (µg/L)	10.54	N/A	15.83	WQBEL
Fe, Dis (µg/L)	550	N/A	N/A	WQBEL
Mn, Dis (µg/L)	152	N/A	3428.25	WQBEL

Hg, Tot (μ g/L)	0.01	N/A	N/A	WQBEL
Zn, Dis (μ g/L)	146.48	N/A	188.79	WQBEL
Whole Effluent Toxicity at	There sh	all be no chronic	toxicity at an	WQBEL
$25^{\circ}C$, Chronic <u>f</u> /	instream waste concentration (IWC) of 100 percent of the final effluent from Outfall 001A			
	percent of the			

- **a**/ See section 1 of the Permit for definition of terms, except for the daily maximum for temperature. The daily maximum for temperature means the highest two-hour average temperature recorded during a given 24-hour period.
- $\underline{\mathbf{b}}$ / WQBEL = Limitation based on water quality-based effluent limit; TBEL = Limitation based on technology based effluent limit; PP = Limitation based on previous permit
- \underline{c} / Percentage Removal Requirements (TSS and CBOD₅ Limitation): In addition to the concentration limits for total suspended solids and CBOD₅ indicated above, the arithmetic mean of the concentration for effluent samples collected in a 30-day consecutive period shall not exceed 15 percent of the arithmetic mean of the concentration for influent samples collected at approximately the same times during the same period (85 percent removal).
- **<u>d</u>**/ The geometric mean shall be reported for *E. coli* and fecal coliform. See Definitions for more information.
- $\underline{\mathbf{e}}$ / The minimum limit of analytical reliability for TRC is considered to be 0.05 mg/L. For purposes of this permit and calculating averages and reporting in the DMR form, analytical values less than 0.05 mg/L shall be considered in compliance with this permit. The TRC limits apply when the chlorination system is used. If not chlorination during the reporting period, report not chlorinating.
- **f**/ The permittee shall conduct chronic toxicity tests using both the *Ceriodaphnia dubia*, Method 1002.0, and *Pimephales promelas*, Method 1000.0. Both species are required to be tested during a routine chronic toxicity test. Sampling for chronic WET tests must be collected using a minimum of three samples (e.g., collected on days one, three, and five) with a maximum holding time of 36 h before first use. Chronic toxicity is present in the effluent when a chronic WET test demonstrates that one (or both) of the two statistical test endpoints, either the NOEC or the IC25, are at any effluent concentration less than the IWC.

Table 26b. Water Quality Based Effluent Limitations for Ammonia-N for Outfall 001A, mg/L

Month	Chronic WQBEL	Acute WQBEL Daily Max.	
	30-Day Avg.		
January	4.3	8.0	
February	6.0	8.0	

March	6.0	9.4
April	9.0	12
May	9.5	20
June	9.7	22
July	9.5	24
August	9.3	24
September	8.8	20
October	8.5	12
November	5.9	8.2
December	4.9	7.3

Table 27a. Final Effluent Limitations for Outfall 001B

Effluent Characteristic	30-Day Average	7-Day Average Effluent	Daily Maximum	Limit Basis b/
	Effluent	Limitations a/	Effluent	
	Limitations a/		Limitations a/	
Flow (mgd)	1.4	N/A	report only	PP
Carbonaceous	25	40	N/A	TBEL
Biochemical Oxygen				
Demand (CBOD5)				
(mg/L)				
Carbonaceous	85	N/A	N/A	TBEL
Biochemical Oxygen				
Demand (CBOD5)				
Percent Removal (%)				
<u>c</u> /				

Total Suspended Solids (TSS) (mg/L)	30	45	N/A	TBEL
Total Suspended Solids (TSS) Percent Removal (%) <u>c</u> /	85%	N/A	N/A	TBEL
рН	Must remain	in the range of 6.5 to	9.0 at all times.	WQBEL
Oil and Grease (O&G) (mg/L)	The concentr samp	ration of oil and greas le shall not exceed 10	se in any single) mg/L.	TBEL
<i>Escherichia coli (E. coli)</i> , number/100 mL <u>d</u> /	126	252	N/A	WQBEL
Temperature, °C (JanMarch)	N/A	13.1	24.1 <u>a</u> /	WQBEL
Total Ammonia (mg/L)		See Table 27 c		WQBEL
Total Residual Chlorine (mg/L) <u>e</u> /	0.011	N/A	0.019	WQBEL
Cyanide (µg/L)	N/A	N/A	5.00	WQBEL
Cd, Dis (µg/L)	0.97	N/A	4.00	WQBEL
Cr+6, Dis (µg/L)	11.0	N/A	16.0	WQBEL
Cu, Dis (µg/L)	12.7	N/A	19.7	WQBEL
Fe, Dis (µg/L)	300	N/A	N/A	WQBEL
Mn, Dis (µg/L)	50	N/A	3417	WQBEL
Hg, Tot (µg/L)	0.01	N/A	N/A	WQBEL
Zn, Dis (µg/L)	175	N/A	231	WQBEL

Whole Effluent	There shall be no chronic toxicity at an instream waste	WQBEL
Toxicity at 25°C,	concentration (IWC) of 100 percent of the final effluent	
Chronic <u>f</u> /	from Outfall 001B.	

- **a**/ See section 1 of the Permit for definition of terms, except for the daily maximum for temperature. The daily maximum for temperature means the highest two-hour average temperature recorded during a given 24-hour period.
- $\underline{\mathbf{b}}$ / WQBEL = Limitation based on water quality-based effluent limit; TBEL = Limitation based on technology based effluent limit; PP = Limitation based on previous permit
- \underline{c} / Percentage Removal Requirements (TSS and CBOD₅ Limitation): In addition to the concentration limits for total suspended solids and CBOD₅ indicated above, the arithmetic mean of the concentration for effluent samples collected in a 30-day consecutive period shall not exceed 15 percent of the arithmetic mean of the concentration for influent samples collected at approximately the same times during the same period (85 percent removal).
- **<u>d</u>**/ The geometric mean shall be reported for *E. coli* and fecal coliform. See Definitions for more information.
- $\underline{\mathbf{e}}$ / The minimum limit of analytical reliability for TRC is considered to be 0.05 mg/L. For purposes of this permit and calculating averages and reporting in the DMR form, analytical values less than 0.05 mg/L shall be considered in compliance with this permit. The TRC limits apply when the chlorination system is used. If not chlorination during the reporting period, report not chlorinating.
- **f**/ The permittee shall conduct chronic toxicity tests using both the *Ceriodaphnia dubia*, Method 1002.0, and *Pimephales promelas*, Method 1000.0. Both species are required to be tested during a routine chronic toxicity test. Sampling for chronic WET tests must be collected using a minimum of three samples (e.g., collected on days one, three, and five) with a maximum holding time of 36 h before first use. Chronic toxicity is present in the effluent when a chronic WET test demonstrates that one (or both) of the two statistical test endpoints, either the NOEC or the IC25, are at any effluent concentration less than the IWC.

Month	Chronic WQBEL <u>a</u> / 30-Day Avg.	Acute WQBEL <u>b</u> / Daily Max.
January	5.1	13
February	4.7	11
March	3.2	7.3
April	1.9	6.1

Table 27b. Water Quality Based Effluent Limitations for Ammonia-N for Outfall 001B, mg/L

May	2.4	7.9
June	3.0	10
July	2.3	9.7
August	1.9	7.9
September	2.3	8.7
October	3.4	11
November	3.7	11
December	3.7	8.9

6.4 Antidegradation

Colorado's regulations concerning anti-degradation of water quality are found in section 31.8, Anti-degradation, of Regulation 31, *The Basic Standards and Methodologies for Surface Water*. The anti-degradation review process is covered under Section 31.8(3) which specified that "The anti-degradation review procedures shall apply to the review of regulated activities with new or increased water quality impacts that may degrade the quality of surface waters that have not been designated as outstanding waters or use-protected waters, including waters previously designated as high quality class 2." Segment 6 of the Fountain Creek Basin is undesignated and therefore an anti-degradation review is required for the discharge to this stream segment. Segment 11 is designated use protected, so an anti-degradation review is not required for that stream segment.

Normally there is no discharge from Outfall 001A except when it is impractical to pump the effluent to NPR#1. At the time of drafting this permit, the AFA WWTF had not discharged from Outfall 001A since 2018. This permit issuance will maintain the requirement that there be no discharge from Outfall 001A except when it is impractical to pump effluent to NPR#1. When it is necessary to have these infrequent discharges from Outfall 001A, the permit will require that the discharge meet applicable effluent limitations to meet the water quality standards for Monument Creek (i.e., segment 6 of the Fountain Creek Basin).

Section 31.8(3)(c) of Colorado Regulation 31 states the following: "The regulated activity shall be considered not to result in significant degradation, as measured in the reviewable waters segment, if the regulated activity will result in short term changes in water quality. This exception shall not apply where long-term operation of the regulated activity will result in an adverse change in water

quality." Therefore, since the occasional discharges from Outfall 001A are temporary in nature, an anti-degradation review for Outfall 001A is not required.

6.5 Anti-Backsliding

Federal regulations at 40 CFR Part 122.44(l)(1) require that when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit unless the circumstances on which the previous permit were based have materially and substantially changed since the time the Permit was issued and would constitute cause for permit modification or revocation and reissuance under 40 CFR Part 122.62.

This permit renewal complies with anti-backsliding regulatory requirements. All effluent limitations, standards, and conditions in the Permit are either equal to or more stringent than those in the previous permit.

7 MONITORING REQUIREMENTS

7.1 Self-Monitoring Requirements

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, as required in 40 CFR Part 122.41(j), unless another method is required under 40 CFR subchapters N or O.

7.1.1 Per- and polyfluoroalkyl substances (PFAS)

As explained at https://www.epa.gov/pfas, PFAS are a group of synthetic chemicals that have been in use since the 1940s. PFAS are found in a wide array of consumer and industrial products. PFAS manufacturing and processing facilities, facilities using PFAS in production of other products, airports, and military installations can be contributors of PFAS releases into the air, soil, and water. Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS. Exposure to some PFAS above certain levels may increase risk of adverse health effects.

EPA's PFAS Strategic Roadmap directs the Office of Water to leverage NPDES permits to reduce PFAS discharges to waterways "at the source and obtain more comprehensive information through monitoring on the sources of PFAS and quantity of PFAS discharged by these sources."

PFAS monitoring is being required in the Permit based on the April 28, 2022, EPA memorandum, "Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations Where EPA is the Pretreatment Control Authority." This is consistent with the agency's commitments in the October 2021 "PFAS Strategic Roadmap: EPA's Commitments to Action 2021-2024 (PFAS Strategic Roadmap)" to restrict PFAS discharges to water bodies. In addition to evaluating the potential for PFAS discharges to waterbodies, the monitoring will inform future permitting actions.

There is no data available regarding the presence/absence or quantification of PFAS parameters in the discharge. Since the potential exists for these parameters to be present in the AFA WWTF discharge, monitoring has been added to the permit for the 40 PFAS parameters in EPA method 1633. Additionally, military bases have been associated with PFAS groundwater contamination, and it is possible PFAS could enter the sewer system through infiltration. Based on recommendations in the April 28, 2022, EPA memorandum, "Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations Where EPA is the Pretreatment Control Authority," in the absence of a final 40 CFR § 136 method, the Permit requires that EPA Draft Method 1633 (in accordance with 40 CFR 122.21(e)(3)(ii) and 40 CFR 122.44(i)(1)(iv)(B)) shall be used. Monitoring will include each of the 40 PFAS parameters detectable by Method 1633 and the monitoring frequency will be quarterly to ensure that there are adequate data to assess the presence and concentration of PFAS in discharges. Method 1633 may become approved under 40 CFR § 136 during the life of the Permit. All PFAS monitoring data, including individual PFAS pollutants, must be reported on DMRs, in accordance with 122.41(1)(4)(i).

If the results of the initial eight (8) quarterly PFAS monitoring samples using method 1633 show there are non-detectable levels of PFAS, the Permittee may submit a request to EPA for a waiver from further testing.

Should PFAS positive results occur in effluent samples for any of the 40 PFAS parameters detectable by Method 1633, the Permittee must perform the steps indicated in Section 8.10 of the Permit, which include notification to EPA, additional monitoring, development and implementation of a PFAS source identification and reduction plan (PFAS Plan).

7.1.2 Self- Monitoring Requirements for Outfall 001A

Outfall 001A effluent characteristics that are subject to self- monitoring requirements (see Section 4 of the Permit) are listed in Table 28 below. The Facility discharges from Outfall 001A when it is impractical to discharge from Outfall 001B. Therefore, to ensure that the effluent is properly characterized by monitoring and is representative of any variability, a minimum of three (3) samples shall be taken during any discharge of wastewater – see footnote "d" under Table 28 below. Composite samples will be required to monitor for most effluent characteristics except where monitoring parameters are not amenable to compositing - pH, temperature, *E. coli*, oil and grease, phosphorous, sulfides, chloride, total residual chlorine, nonylphenol, hexavalent chromium (Cr+6), WET, and PFAS samples.

Effluent Characteristic	Monitoring Frequency	Samples Type <u>a</u> /	Data Reported on DMR <u>b</u> /	
Flow, mgd <u>c</u> /	Continuous	Grab	Daily Max.	
			30-Day Avg.	
			Duration in Days	
CBOD ₅ , mg/L	<u>d</u> /	Composite	Daily Max.	
			30-Day Avg.	
			30-Day Avg. %	
			removal	
TSS, mg/L	<u>d</u> /	Composite	Daily Max.	

Table 28. Monitoring and reporting requirements for Outfall 001A

			30-Day Avg.
			30-Day Avg. %
			removal
pH, units	d/	Grab	Instantaneous Min.
F,	<u></u>		Instantaneous Max.
O&G, visual e/	d/	Visual	Narrative
Escherichia coli (E. coli).	<u>_</u>	Grab	Daily Max.
number/100 mL	<u></u>		30-Day Avg.
Temperature, °C f/	Continuous	Grab	DMET
r · · · · · · · · · · · · · · · · · ·			WAET f/
Total Ammonia Nitrogen (as	d/	Composite	Daily Max.
N), mg/L		I I I I I I I I I I I I I I I I I I I	30-Day Avg.
Total Inorganic Nitrogen.	d/	Composite	Daily Max.
mg/L g/		I I I I I I I I I I I I I I I I I I I	30-Day Avg.
Total Nitrogen, mg/L h/	d/	Composite	Daily Max.
		I I I I I I I I I I I I I I I I I I I	30-Day Avg.
Total Phosphorus, mg/L i/	d/	Composite	Daily Max.
		I I I I I I I I I I I I I I I I I I I	30-Day Avg.
Sulfide, mg/L	d/	Grab	30-Day Avg.
Chloride, mg/L		Composite	30-Day Avg.
Total Residual Chlorine,	d/	Grab	Daily Max.
mg/L j/	—		30-Day Avg.
Cyanide, µg/L	d/	Composite	Daily Max.
Nonylphenol, µg/L	d/	Grab	Daily Max.
	—		30-Day Avg.
As, Dis (µg/L)	d/	Composite	Daily Max.
As, TR (μ g/L)		Composite	Daily Max.
Cd, Dis (µg/L)	<u>d</u> /	Composite	Daily Max.
	—	1	30-Day Avg.
Cd, TR (µg/L)	d/	Composite	Daily Max.
Cr+3, Dis (µg/L)	d/	Composite	Daily Max.
Cr+3, TR (µg/L)	<u>d</u> /	Composite	Daily Max.
Cr+6, Dis (µg/L)	<u>d</u> /	Grab	Daily Max.
	_		30-Day Avg.
Cu, Dis (µg/L)	d/	Composite	Daily Max.
	_	1	30-Day Avg.
Fe, Dis (µg/L)	d/	Composite	30-Day Avg.
Fe, TR (µg/L)	d/	Composite	Daily Max.
Pb, Dis $(\mu g/L)$		Composite	Daily Max.
Pb, TR (μ g/L)	d/	Composite	Daily Max.
Mn, Dis (µg/L)		Composite	Daily Max.
	_		30-Day Avg.
Mo, TR Dis (µg/L)	<u>d</u> /	Composite	Daily Max.
Hg, Tot (µg/L)	<u>d</u> /	Composite	30-Day Avg.
Ni, Dis (µg/L)	<u>d</u> /	Composite	Daily Max.

Ni, TR (µg/L)	<u>d</u> /	Composite	Daily Max.
Se, Dis (µg/L)	<u>d</u> /	Composite	Daily Max.
Ag, Dis (µg/L)	<u>d</u> /	Composite	Daily Max.
Ur, (μg/L)	<u>d</u> /	Composite	Daily Max.
Zn, Dis (µg/L)	<u>d</u> /	Composite	Daily Max. 30-Day Avg
WET at 25° C, Chronic	See section 5.1	Grab	Pass / Fail
PFAS (ng/L)	Quarterly 1/	Grab	Daily Max

- $\underline{\mathbf{a}}$ See section 1 of the Permit for definition of terms.
- \mathbf{b} / Refer to the Permit for requirements regarding how to report date on the DMR.
- $\underline{\mathbf{c}}$ / Flow measurements of effluent volume shall be made in such a manner that the Permittee can affirmatively demonstrate that representative values are being obtained. The average flow rate in million gallons per day (mgd) during the reporting period and the maximum flow rate observed, in mgd, shall be reported.
- \mathbf{d} A minimum of three (3) samples shall be taken during any discharge of wastewater. It is required that a sample be taken at the beginning, middle, and end of the discharge if the discharge is less than one week in duration. If a single, continuous discharge is greater than one week in duration, three (3) samples shall be taken during the first week and one (1) during each following week. All of the samples collected during the 7-day or 30-day period are to be used in determining the averages.
- $\underline{\mathbf{e}}$ A daily visual observation is required. If a visible sheen is detected, a grab sample shall be taken promptly and analyzed in accordance with the requirements of 40 CFR Part 136. The concentration of oil and grease shall not exceed 10 mg/L in any sample.
- **f**/ The permittee shall monitor the temperature of the effluent at a minimum frequency of hourly with values rounded to the nearest 0.1 °C. The "Weekly Average Effluent Temperature" (WAET) and the "Daily Maximum Effluent Temperature" (DMET) during the reporting period shall be reported. The WAET shall be based on the highest 7-day mean of daily average effluent temperature over a 7- day consecutive period. At least 4 days of the 7 days shall occur during the reporting period. The DMET shall be based on the highest 2-hour mean of effluent temperature during the reporting period.
- **g**/ For purposes of this permit, the term "total inorganic nitrogen (T.I.N.)" is defined as the sum of the concentrations of total ammonia nitrogen (as N) plus total nitrate and nitrite (or nitrate and nitrite individually) (as N).
- $\underline{\mathbf{h}}$ For the purposes of this permit, the term "total nitrogen (TN)" is defined as total Kjeldahl nitrogen plus nitrate-nitrite (or the components to calculate total nitrogen) (as N).

- \mathbf{i} / For purposes of this permit "total phosphorus (TP)" may be determined by the analysis for total phosphorus or the analyses of the components to calculate total phosphorus.
- **j**/ Monitoring for total residual chlorine only required if the effluent is chlorinated. If no chlorinating during the reporting period, report "Not Chlorinating."
- **k**/ The permittee shall conduct chronic toxicity tests using both the *Ceriodaphnia dubia*, Method 1002.0, and *Pimephales promelas*, Method 1000.0. Both species are required to be tested during a routine chronic toxicity test. Sampling for chronic WET tests must be collected using a minimum of three samples (e.g., collected on days one, three, and five) with a maximum holding time of 36 h before first use. Chronic toxicity is present in the effluent when a chronic WET test demonstrates that one (or both) of the two statistical test endpoints, either the NOEC or the IC25, are at any effluent concentration less than the IWC.
- Use EPA Draft Method 1633 until EPA approves a 40 CFR Part 136 method. Analysis shall be for the 40 PFAS parameters included in the method. If the results of the initial eight (8) quarterly PFAS monitoring samples using Method 1633 show non-detectable levels of PFAS, the Permittee may submit a request for a waiver from further testing for approval of the appropriate EPA delegated representative.
- 7.1.3 Self- Monitoring Requirements for Outfall 001B

Outfall 001B effluent characteristics that are subject to self-monitoring requirements (see Section 4 of the Permit) are listed in Table 29 below. The Facility discharges from Outfall 001B on a continuous basis. To ensure potential variability in the effluent is characterized, composite samples will be required to monitor for most effluent characteristics except where monitoring parameters are not amenable to compositing - pH, temperature, *E. coli*, oil and grease, phosphorous, sulfides, chloride, total residual chlorine, nonylphenol, hexavalent chromium (Cr+6), WET, and PFAS samples.

Effluent Characteristic	Monitoring	Samples	Data Reported on
	Frequency	Туре <u>а</u> /	DMR <u>b</u> /
Flow, mgd	Continuous	Grab	Daily Max.
			30-Day Avg.
			Duration in Days
CBOD5, mg/L	2/Week	Composite	Daily Max.
			30-Day Avg.
			30-Day Avg. %
			removal
TSS, mg/L	2/Week	Composite	Daily Max.
			30-Day Avg.
			30-Day Avg. %
			removal
pH, units	Daily	Grab	Instantaneous Min.
			Instantaneous Max.
O&G, visual	Daily	Visual	Narrative
Escherichia coli (E. coli),	2/Week	Grab	Daily Max.
number/100 mL			30-Day Avg.

 Table 29. Monitoring and reporting requirements for Outfall 001B

Temperature, °C	Continuous	Grab	Daily Max.
			30-Day Avg.
Total Ammonia Nitrogen (as	2/Week	Composite	Daily Max.
N), mg/L <u>e</u> /			30-Day Avg.
Total Inorganic Nitrogen, mg/L	Monthly	Composite	Daily Max.
<u>f</u> /			30-Day Avg.
Total Nitrogen, mg/L <u>g</u> /	Monthly	Composite	Daily Max.
			30-Day Avg.
Total Phosphorus, mg/L <u>h</u> /	Monthly	Composite	Daily Max.
			30-Day Avg.
Sulfide, mg/L	Monthly	Grab	30-Day Avg.
Chloride, mg/L	Monthly	Composite	30-Day Avg.
Total Residual Chlorine, mg/L	Monthly	Grab	Daily Max.
<u>i</u> /			30-Day Avg.
Cyanide, µg/L	Monthly	Composite	Daily Max.
Nonylphenol, µg/L	Monthly	Grab	Daily Max.
			30-Day Avg.
As, Dis (µg/L)	Monthly	Composite	Daily Max.
As, TR (μ g/L)	Monthly	Composite	Daily Max.
Cd, Dis (µg/L)	Monthly	Composite	Daily Max.
			30-Day Avg.
Cd, TR (µg/L)	Monthly	Composite	Daily Max.
Cr+3, Dis (μ g/L)	Monthly	Composite	Daily Max.
Cr+3, TR (µg/L)	Monthly	Composite	Daily Max.
Cr+6, Dis (µg/L)	Monthly	Grab	Daily Max.
			30-Day Avg.
Cu, Dis (µg/L)	Monthly	Composite	Daily Max.
			30-Day Avg.
Fe, Dis (µg/L)	Monthly	Composite	30-Day Avg.
Fe, TR (µg/L)	Monthly	Composite	Daily Max.
Pb, Dis (μ g/L)	Monthly	Composite	Daily Max.
Pb, TR (μ g/L)	Monthly	Composite	Daily Max.
Mn, Dis ($\mu g/L$)	Monthly	Composite	Daily Max.
			30-Day Avg.
Mo, TR Dis (μ g/L)	Monthly	Composite	Daily Max.
Hg, Tot (µg/L)	Monthly	Composite	30-Day Avg.
Ni, Dis (µg/L)	Monthly	Composite	Daily Max.
Ni, TR ($\mu g/L$)	Monthly	Composite	Daily Max.
Se, Dis (µg/L)	Monthly	Composite	Daily Max.
Ag, Dis (µg/L)	Monthly	Composite	Daily Max.
Ur, (µg/L)	Monthly	Composite	Daily Max.
Zn, Dis ($\mu g/L$)	Monthly	Composite	Daily Max.
			30-Day Avg
WET at 25° C, Chronic	See section	Grab	Pass / Fail
	5.1		

PFAS (ng/L)	Quarterly <u>k</u> /	Grab	Daily Max
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- $\underline{\mathbf{a}}$ See section 1 of the Permit for definition of terms.
- \mathbf{b} / Refer to the Permit for requirements regarding how to report date on the DMR.
- \underline{c} / Flow measurements of effluent volume shall be made in such a manner that the Permittee can affirmatively demonstrate that representative values are being obtained. The average flow rate in million gallons per day (mgd) during the reporting period and the maximum flow rate observed, in mgd, shall be reported.
- $\underline{\mathbf{d}}$ A daily visual observation is required. If a visible sheen is detected, a grab sample shall be taken promptly and analyzed in accordance with the requirements of 40 CFR Part 136. The concentration of oil and grease shall not exceed 10 mg/L in any sample.
- e/ The permittee shall monitor the temperature of the effluent at a minimum frequency of hourly with values rounded to the nearest 0.1 °C. The "Weekly Average Effluent Temperature" (WAET) and the "Daily Maximum Effluent Temperature" (DMET) during the reporting period shall be reported. The WAET shall be based on the highest 7-day mean of daily average effluent temperature over a 7- day consecutive period. At least 4 days of the 7 days shall occur during the reporting period. The DMET shall be based on the highest 2-hour mean of effluent temperature during the reporting period.
- **<u>f</u>**/ For purposes of this permit, the term "total inorganic nitrogen (T.I.N.)" is defined as the sum of the concentrations of total ammonia nitrogen (as N) plus total nitrate and nitrite (or nitrate and nitrite individually) (as N).
- **g**/ For the purposes of this permit, the term "total nitrogen (TN)" is defined as total Kjeldahl nitrogen plus nitrate-nitrite (or the components to calculate total nitrogen) (as N).
- $\underline{\mathbf{h}}$ For purposes of this permit "total phosphorus (TP)" may be determined by the analysis for total phosphorus or the analyses of the components to calculate total phosphorus.
- i/ Monitoring for total residual chlorine only required if the effluent is chlorinated. If no chlorinating during the reporting period, report "Not Chlorinating."
- **j**/ The permittee shall conduct chronic toxicity tests using both the *Ceriodaphnia dubia*, Method 1002.0, and *Pimephales promelas*, Method 1000.0. Both species are required to be tested during a routine chronic toxicity test. Sampling for chronic WET tests must be collected using a minimum of three samples (e.g., collected on days one, three, and five) with a maximum holding time of 36 h before first use. The test results apply to both outfalls. Separate tests do not have to be done for each outfall. Chronic toxicity is present in the effluent when a chronic WET test demonstrates that one (or both) of the two statistical test endpoints, either the NOEC or the IC25, are at any effluent concentration less than the IWC.
- k/ Use EPA Draft Method 1633 until EPA approves a 40 CFR Part 136 method. Analysis shall be for the 40 PFAS parameters included in the method. If the results of the initial eight (8) quarterly PFAS monitoring samples using Method 1633 show non-detectable levels of PFAS, the Permittee may submit a request for a waiver from further testing for approval of the appropriate EPA delegated representative.

8 SPECIAL CONDITIONS

N/A.

9 REPORTING REQUIREMENTS

Reporting requirements are based on requirements in 40 CFR §§ 122.44, 122.48, and Parts 3 and 127. A discharge monitoring report (DMR) frequency of monthly was chosen, because the Facility typically discharges continuously via Outfall 001B.

10 COMPLIANCE RESPONSIBILITIES AND GENERAL REQUIREMENTS

10.1 Inspection Requirements

On a weekly basis, unless otherwise modified in writing by EPA, the Permittee shall inspect its treatment facility. The permittee shall document the inspection, as required by the Permit. Inspections are required due to frequency of discharge and to ensure proper O&M in accordance with 40 CFR 122.41(e).

10.2 Operation and Maintenance

40 CFR § 122.41(e) requires permittees to properly operate and maintain at all times, all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. In addition to an operation and maintenance plan, regular facility inspections, an asset management plan (AMP), and consideration of staff and funding resources are important aspects of proper operation and maintenance. Asset management planning provides a framework for setting and operating quality assurance procedures and helps to ensure the permittee has sufficient financial and technical resources to continually maintain a targeted level of service. Consideration of staff and funding provide the permittee with the necessary resources to operate and maintain a well-functioning facility.

An AMP can be used to forecast relevant needs and costs associated with climate change-related impacts, particularly in communities that will be impacted by increased flooding risk. By outlining how changing weather patterns and natural disasters might affect the facility, the Permittee can develop long-term construction and funding plans for upgrading or relocating critical infrastructure. Aside from accounting for impacts resulting from climate change, facilities should optimize their energy efficiency to help mitigate greenhouse gas emissions. Using asset management planning to maximize the energy efficiency can yield substantial economic benefits, in addition to helping cut down on associated emissions.

Operation and maintenance requirements have been established in sections 6.3 of the Permit to help ensure compliance with the provisions of 40 CFR 122.41(e).

10.3 Industrial Waste Management

The Facility is similar in operation to a Publicly Owned Treatment Works (POTW) as defined in 40 CFR § 403.3(q). The Permit contains requirements for the Permittee to protect the Facility from pollutants which would inhibit, interfere with, or otherwise be incompatible with operation of the treatment works including interference with the use or disposal of sludge. Pass through and interference are defined in 40 CFR §§ 403.3(p), (k), respectively.

The Facility is required to conduct an Industrial Waste Survey (IWS), as described in the Permit, within one year of the Permit effective date. At the time of this permit issuance, the permit record does not indicate that an IWS has been performed at this facility previously. Therefore, an IWS will be required to ensure that all sources contributing waste to the Facility are documented in the permit record.

10.4 Per- and Polyfluoroalkyl Substances (PFAS) Notification and Plan

As discussed in section 7.1.1 of the SoB, PFAS monitoring is included in the Permit based on the April 28, 2022 EPA memorandum, "Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations Where EPA is the Pretreatment Control Authority." In accordance with 40 CFR Part 122.44(k), the Permit includes best management practices (BMPs) to control or abate the discharge of PFAS when it is found to be present. The Permittee is required to provide notification the first time PFAS is detected in the effluent. Additionally, the Permittee is required to develop and implement a PFAS Plan, as described in section 8.11 of the Permit. PFAS is known to cause risks to human health. The purpose of these BMPs is identify sources of PFAS and keep PFAS out of the environment.

11 ENDANGERED SPECIES CONSIDERATIONS

The Endangered Species Act of 1973 requires all Federal Agencies to ensure, in consultation with the U.S. Fish and Wildlife Service (FWS), that any Federal action carried out by the Agency is not likely to jeopardize the continued existence of any endangered species or threatened species (together, "listed" species), or result in the adverse modification or destruction of habitat of such species that is designated by the FWS as critical ("critical habitat"). See 16 U.S.C. § 1536(a)(2), 50 CFR Part 402. When a Federal agency's action "may affect" a protected species, that agency is required to consult with the FWS (formal or informal) (50 CFR § 402.14(a)).

The U.S. Fish and Wildlife Information for Planning and Conservation (IPaC) website (https://ecos.fws.gov/ipac/) was accessed on March 31, 2022 to determine federally-listed Endangered, Threatened, Proposed and Candidate Species for the area near the Facility. The IPaC Trust Resource Report findings are provided below. The designated area utilized was identified in the IPaC search and includes all four NPR's.

Species	Scientific Name	Species Status	Designated Critical Habitat
Gray Wolf	Canis lupus	Endangered	None <u>a</u> /
Preble's Meadow Jumping Mouse	Zapus hudsonius preblei	Threatened	None <u>a</u> /
Eastern Black Rail	Laterallus jamaicensis ssp. jamaicensis	Threatened	None <u>b</u> /
Mexican Spotted Owl	Strix occidentalis lucida	Threatened	None <u>b</u> /

 Table 30. IPaC Federally listed Threatened and Endangered Species

Piping Plover	Charadrius melodus	Threatened	None <u>a</u> /
Greenback Cutthroat Trout	Oncorhynchus clarkii stomias	Threatened	None <u>b</u> /
Pallid Sturgeon	Scaphirhynchus albus	Endangered	None <u>b</u> /
Ute Ladies'- tresses	Spiranthes diluvialis	Threatened	None <u>b</u> /

<u>a</u>/ Final critical habitat exists for this species. However, per IPaC the project location "does not overlap the critical habitat."

- $\underline{\mathbf{b}}$ Per IPac "No critical habitat has been designated for this species."
- 11.1 Biological Evaluation

The justification to support the determination for the species is as follows.

The Facility was previously covered under an EPA Region 8 NPDES individual permit. This facility discharges via Outfall 001B into Non-Potable Reservoir No. 1 on Lehman Run, a tributary to Monument Creek, and occasionally to Monument Creek directly via Outfall 001A. Water discharged into Non-Potable Reservoir No. 1 is used for the irrigation of approximately 184 acres of landscape, recreational fields, etc. The rates of discharge are expected to be similar to those during the previous permit and the permit effluent limitations are at least as stringent as in the previous permit. The Facility location is outside of the critical habitat for all species of concern identified by IPaC, listed in Table 30 above.

As indicated by the table above, there is final critical habitat for the Grey Wolf, however, it does not overlap with the project area relevant to this permit although lone, dispersing gray wolves may be present throughout the state of Colorado. Furthermore, per IPaC, the Grey Wolf only needs to be considered in a biological evaluation if the proposed activity includes a predator management program. Currently no predator management program is in place at the Air Force Academy. Therefore, EPA's determination for this species is "no effect."

Preble's Meadow Jumping Mouse has final critical habitat as well, however there is no critical habitat for this species within the project area. During summer months, the most important wetland types occupied by Preble's Meadow Jumping Mice include riparian areas and adjacent wet meadows. During the summer, they prefer dense shrub, grass and forb ground cover along creeks, rivers, and associated waterbodies. From early fall through the spring, they hibernate underground in burrows that are typically at the base of vegetation. As mentioned above, the Facility primarily discharges to NPR#1 via Outfall 001B which is located within the recreational grounds of the Air Force Academy which are groomed year round and therefore unlikely to develop the types of vegetation that would attract Preble's Meadow Jumping Mice. While some riparian habitat may exist along Monument Creek, discharges to Monument Creek via Outfall 001A are infrequent, occuring only when it is impractical to discharge via Outfall 001B. Exposure to unmixed effluent would only occur in the event of an uncontrolled release from the Facility or if severe flooding were to occur in the immediate vicinity of Outfall 001A, neither of which has never occurred in the Facility's history. Due to the unlikelihood of this species' exposure to the Facility's effluent, EPA's determination for this species is "no effect."

Three bird species were identified by IPaC, the Eastern Black Rail, the Mexican Spotted Owl, and the piping plover. No final critical habitat has been designated for the Eastern Black Rail. The Eastern Black Rail relies most frequently on dense emergent marshes, including beaver ponds as habitat. This type of habitat is not available in the vicinity of either Outfall 001A or Outfall 001B. Therefore, EPA's determination for this species is "no effect. Final critical habitat has been determined for the Mexican Spotted Owl, however IPaC indicates that no critical habitat exists for this species within the bounds of the project area. The Mexican Spotted Owl is found in mixed-conifer forests, Madrean pine-oak forests, and rocky canyons. Nesting habitat is typically in areas with complex forest structure or rocky canyons and contains mature or old growth stands which are uneven-aged, multistoried, and have high canopy closure. In the northern portion of the range (southern Utah and Colorado), most nests are in caves or on cliff ledges in steep-walled canyons. Elsewhere, the majority of nests are in Douglas-fir trees. This type of habitat is not available in the vicinity of either Outfall 001A or Outfall 001B. Therefore, EPA's determination for the Mexican Spotted Owl is "no effect." The Piping Plover only needs to be considered if the proposed activity occurs in the North Platte, South Platte or Laramie River Basins. This does not apply to discharges authorized by this permit and therefore the EPA's determination for the Piping Plover is "no effect."

Two species of fish were identified in the IPaC search: the Greenback Cutthroat Trout (GBCT) and the Pallid Sturgeon. Final critical habitat has not been determined for either species. A 2019 Recovery Outline for the GBCT co-authored by the Colorado Parks and Wildlife, U.S. Forest Service, National Park Service, U.S. Bureau of Land Management, and the U.S. Fish and Wildlife Service indicates that "pure GBCT populations are present in only three streams (Bear Creek, Herman Gulch, and Dry Gulch) and one lake (Zimmerman Lake)." These waterbodies are outside the project area, and therefore the EPA's determination for the GBCT is "no effect." The Pallid Sturgeon only needs to be considered if the proposed activity occurs in the North Platte, South Platte or Laramie River Basins. This does not apply to discharges authorized by this permit and therefore the EPA's determination for the Pallid Sturgeon is "no effect."

The only plant species identified by the IPaC search was the Ute Ladies'-Tresses. Final critical habitat has not been determined for this species. Ute Ladies'-Tresses are found in moist meadows associated with perennial stream terraces, floodplains, and oxbows at elevations between 4300-6850 feet (1310-2090 meters) as well as seasonally flooded river terraces, sub-irrigated or spring-fed abandoned stream channels and valleys, and lakeshores. This type of habitat is not available in the vicinity of either Outfall 001A or Outfall 001B. Therefore, EPA's determination for the Ute Ladies'-Tresses is "no effect."

Before going to public notice, a copy of the draft Permit and this Statement of Basis was sent to the FWS requesting concurrence with EPA's initial finding that reissuance of this NPDES Permit "may affect, but is not likely to adversely affect" the species listed above. However, during the public comment period conversations between the FWS and EPA initiated the review and revision of this section which resulted in EPA's current finding that the reissuance of this NPDES Permit will have "no effect" on the species listed as threatened or endangered in the action area by the FWS under the Endangered Species Act nor their critical habitat.

12 NATIONAL HISTORIC PRESERVATION ACT REQUIREMENTS

Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470(f) requires that federal agencies consider the effects of federal undertakings on historic properties. The first step in this analysis is to consider whether the undertaking has the potential to affect historic properties, if any are present. See 36 CFR 800.3(a)(1). Permit renewals where there is no new construction are generally not the type of action with the potential to cause effects on historic properties.

13 ENVIRONMENTAL JUSTICE

N/A.

14 401 CERTIFICATION CONDITIONS

Colorado is the Clean Water Act (CWA) Section 401 certifying authority for the Permit, and a CWA Section 401 certification was requested prior to Permit finalization, on October 18th, 2022. No response was received by the EPA within the 60 day reasonable period of time which ended on December 18th, 2022. As explained in the request for certification, the State's failure to issue or deny certification within the specified reasonable time is considered by EPA to be a waiver of the certification requirement unless EPA finds that unusual circumstances require more time. No such circumstances have been identified by EPA, therefore the certification is waived.

15 MISCELLANEOUS

The effective date of the Permit and the Permit expiration date will be determined upon issuance of the Permit. The intention is to issue the Permit for a period not to exceed 5 years.

Permit drafted by Margaret Kennedy, U.S. EPA, (303) 312-6644 [May 2022].

ADDENDUM

AGENCY CONSULTATIONS

A copy of the draft Permit and Statement of Basis was sent to the FWS requesting concurrence with EPA's initial finding that reissuance of this NPDES Permit "may affect, but is not likely to adversely affect" on October 18th, 2022. However, during the public comment period, which initiated on October 21st, 2022 and ended on November 21st, 2022, conversations between the FWS and EPA initiated the review and revision of this section and resulted in EPA's final finding that the reissuance of this NPDES Permit will have "no effect" on the species listed in Table 30 as threatened or endangered in the action area by the FWS under the Endangered Species Act nor their critical habitat. The FWS was notified of this update on December 12th, 2022.

On October 18th, 2022, EPA sent a sent a CWA Section 401 certification request to Colorado. Colorado waived Section 401 certification.

PUBLIC NOTICE AND RESPONSE TO COMMENTS

The Permit and statement of basis were public noticed on EPA's website on October 21st, 2022. No comments were received.