STATEMENT OF BASIS

PERMITTEE:	United States Department of the Army
FACILITY:	Fort Carson, Colorado
PERMIT NO.:	CO-0021181
RESPONSIBLE OFFICIAL:	Carlos Rivero-deAguilar, Chief, Directorate of Public Works, Environmental Division 1626 O'Connell blvd., Bldg 813 Fort Carson, CO 80913 719-526-6838 E-mail carlos.deaguilar@us.army.mil
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PERMIT TYPE	Major Federal Facility, Permit Renewal

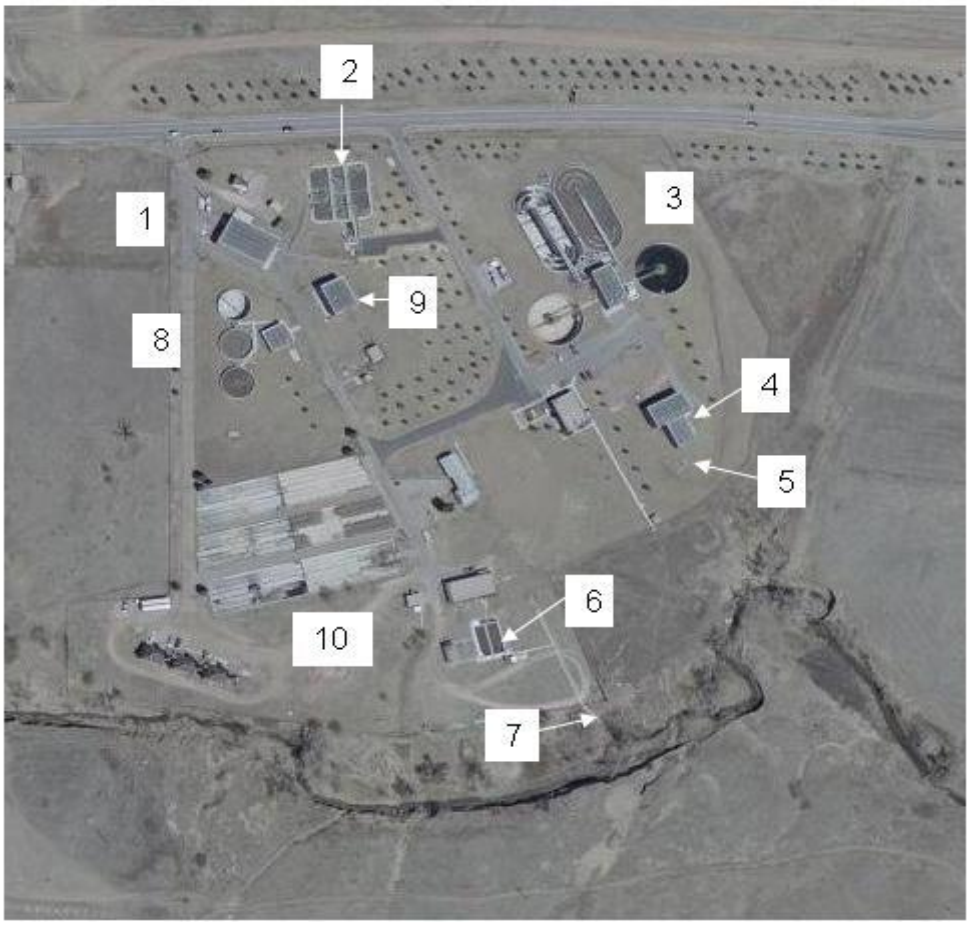
This statement of basis (SOB) is for the 2010/2011 renewal of the National Pollutant Discharge Elimination System (NPDES) permit for the discharge from Fort Carson's sanitary wastewater treatment facility (WWTF). The previous permit was issued in 2005 and expired on September 30, 2010. It has been administratively extended.

Background Information:

The Fort Carson Army Base is located just to the south of the City of Colorado Springs, El Paso County, Colorado. Various military units, including both federal and national guard units, can be assigned to Fort Carson or be there temporarily for training. There are on-base family housing units. In addition to the on-base sanitary sewage, the WWTF also receives effluent from the Fort Carson Industrial wastewater treatment plant (IWTP) and the sanitary sewage and miscellaneous wastewater from the U.S. Air Force's nearby Cheyenne Mountain Air Force Station. The IWTP receives wastewater (and some stormwater runoff) from vehicle wash areas and vehicle maintenance facilities. The population served includes residential, non-transient, and transient population and is estimated to be greater than 40,000 but less than 50,000. The actual population served can vary with troop deployments, etc.

The present treatment process includes preliminary treatment, aerated flow equalization, secondary treatment with nitrification/denitrification, followed by tertiary filtration and UV disinfection. In a letter of June 22, 2010, the Water Quality Control Division of the Colorado Department of Public Health and Environment (CDPHE) conditionally approved the Process Design Report (PDR) and Plans and Specifications for upgrading the WWTF. The approval was for modification of the equalization basin effluent metering facility, addition of additional aeration capacity, and modification of the back-up power facilities. These modifications are anticipated to be completed and on-line by August 15, 2011. With the approved modifications, the approved hydraulic and organic design capacities would be 4.00 MGD and 8,500 lbs. BOD_5/day, respectively. A copy of the flow schematic of the WWTF submitted with the application for renewal of the permit is shown in Attachment A. An aerial view of the WWTF is given in Figure 1 below.

Figure 1
Aerial View of Fort Carson Sanitary Wastewater Treatment Facility



Identification of Numbers: 1 = Headworks Building; 2 = Flow Equalization Basin;
3 = Oxidation Ditches & Secondary Clarifiers; 4 = Tertiary Filtration & UV Disinfection Building; 5 = Parshall Flume; 6 = Old Chlorine Contact Chamber; 7 = Outfall 001;
8 = Aerobic Digesters; 9 = Sludge Dewatering Building; 10 = Sludge Drying Beds

The preliminary treatment occurs in the headworks building and includes coarse screening, fine screening, aerated grit and grease removal, and flow measurement with a Parshall flume. The effluent from the headworks building normally gravity flows to the aerated flow equalization basin, but it can be routed directly (by gravity flow) at a flow splitter box to the oxidation ditches. Normally the wastewater is pumped from the flow equalization basin and then gravity flows to the oxidation ditches.

There are two 1.4-million gallon oxidation ditches for providing biological treatment that can be operated in series or parallel. Presently only one oxidation ditch is being used and it is operated to achieve nitrification and some denitrification. The denitrification is achieved by turning the aeration off for about an hour after about three hours of aeration. There are two 85-foot diameter circular clarifiers, with only one being used at the present time.

The filtration and UV disinfection occur in a separate building. Filtration is provided by up-flow filters that have 42" deep moving sand bed media. There are two UV channels for providing disinfection. Each channel has three consecutive modules with 78 lamps per module.

Following UV disinfection, the flow goes to a 12"-Parshall flume located just to the south of the filtration & disinfection building. The flow is continuously monitored and recorded. The flow then goes to the old chlorine contact chamber (CCC) that was left from the previous WWTF. The chlorination equipment has been removed from the CCC. In the CCC the flow is routed through the channel along the west side of the CCC and into an effluent sump at the south end. The west channel and the effluent sump have been covered with plywood in an effort to minimize the growth of algae. From the effluent sump the effluent can either overflow to the outfall line or be pumped to the Fort Carson golf course to be used for irrigation. The outfall line is approximately 30" in diameter and 200 feet long and discharges into the Clover Ditch drainage approximately 50' from Clover Ditch. There is a path and stairs that lead to the end of the outfall line. **This is Outfall 001,** and the effluent samples are collected at this point.

The golf course is located near the western boundary of Fort Carson and has an area of about 126 irrigated acres. There is a buried pipeline that connects the effluent sump of the CCC with a pump and pipeline that are used to pump effluent to a storage pond located on the golf course. The storage pond is located in Sec. 29, T15S, R66W. A flow meter on the pipeline is used to determine the amount of flow that is pumped to the storage pond. To determine the amount of water discharged from Outfall 001, it is necessary to subtract the flow pumped to the golf course from the flow measured at the Parshall flume. In the permit issued in 1999 the diversion of flow to the golf course was identified as **Outfall 002**. Although the effluent pumped to the golf course for landscape watering was not discharged to "Waters of the United States", as a precautionary measure the 1999 permit required that the effluent meet the State's Regulations for Effluent Limitations. This requirement was effective immediately upon issuance of the permit and lasted until the State of Colorado formally adopted rules and regulations on the land application of treated wastewater. Regulation No. 84, Reclaimed Water Control Regulation, was originally adopted on October 10, 2000, with an effective date of November 30, 2000, and subsequently amended with effective dates of June 30, 2004, November 30, 2005, and September 30, 2007. Accordingly, the renewal permit issued in 2005 did not have any effluent limitations on the water pumped to the golf course.

The EPA does not have any regulatory authority over the water pumped to the golf course, provided that there is no discharge to "Waters of the United States." It is Fort Carson's responsibility to comply with the requirements of Regulation No. 84.

There are three aerobic digesters for treating the waste activated sludge from the secondary clarifiers. The digesters are operated in batch mode, with supernatant periodically drawn off and additional waste activated sludge added until the desired percent solids in the digester is obtained. Following digestion, the sludge is dewatered on a 2.0-meter wide belt filter press, with a polymer added to improve the dewatering. The dewatered sludge is approximately 15% solids and is temporarily stored on the old sludge drying beds until it is hauled by a contractor to an off-site landfill for disposal. Fort Carson has coverage under the general permit issued by Region 8 for the use/disposal of biosolids in Federal facilities in Colorado (COG-652000).

The effluent limitations in the previous permit (2005) are shown in Table 1 below.

TABLE 1 - EFFLUENT LIMITATIONS FOR PERMIT ISSUED IN 2005

Effluent Characteristic	Effluent Limitation			Basis for Effluent Limitation e/
	30-Day Average a/	7-Day Average a/	Daily Maximum a/	
Flow, MGD	4.0	N/A	N/A	Design Capacity
BOD_5, mg/L (Kg/day) c/	30 (454)	45 (681)	N/A	CER
Total Suspended Solids, mg/L (Kg/day) c/	30 (454)	45 (681)	N/A	CER
E. Coli, no./100 mL	126	252	N/A	WQS
Ammonia, Total (as N), mg/L				
January	N/A	N/A	N/A	
February	13.6	N/A	N/A	WQS
March	12.5	N/A	18	WQS
April	20	N/A	N/A	WQS
May	23	N/A	N/A	WQS
June	28	N/A	N/A	WQS
July	N/A	N/A	N/A	
August	N/A	N/A	N/A	
September	N/A	N/A	26	WQS
October	N/A	N/A	N/A	
November	N/A	N/A	N/A	
December	N/A	N/A	N/A	
Oil and Grease, mg/L	N/A	N/A	10	CER
Dissolved Oxygen, mg/L, Minimum b/	N/A	N/A	5.0 b/	WQS
Chromium, Total Recoverable, ug/L	N/A	N/A	53	WQS
Iron, Potentially Dissolved, ug/L d/	334	N/A	N/A	WQS
Iron, Total Recoverable, ug/L	2,690	N/A	N/A	WQS
Nickel, Potentially Dissolved, ug/L d/	142	N/A	1,208	WQS
There shall be no acute toxicity in the final effluent discharged from Outfall 001.				WQS & CWA
The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.				WQS

a/ See Definitions, Part 1.1., for definition of terms.

b/ The concentration of dissolved oxygen shall not be less than 5.0 mg/L in any grab sample or instantaneous measurement.

c/ Percentage Removal Requirement (TSS and BOD_5 Limitation): In addition to the concentration limits for total suspended solids and BOD_5 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).

d/ "Potentially Dissolved Metals" means that portion of a constituent measured from the filtrate of a water and suspended sediment sample that was first treated with nitric acid to a pH of less than 2.0 and let stand for 8 to 96 hours prior to sample filtration using a 0.4 or 0.45 um membrane filter. Note: The "Potentially Dissolved" method cannot be used where nitric acid will interfere with the analytical procedure used for the constituent measured.

e/ Basis for effluent Limitations: CER = Colorado Department of Public Health and Environment, Water Quality Control Commission's Regulations for Effluent Limitations (Colorado Regulation No. 62); CWA = Clean Water Act; WQS = Water Quality Standards;.

The water quality based effluent limitations on metals and ammonia in Table 1 were based on the Water Quality Assessment (WQA) of Fountain Creek, East Sand Creek, and Clover Ditch near the City of Colorado Springs Wastewater Treatment Facility (WWTF) (Colorado Springs WWTF), the Cherokee Metropolitan District WWTF (Cherokee WWTF), the Security Sanitation District WWTF, (Security WWTF) the US Army-Fort Carson WWTF (Fort Carson WWTF), the Widefield Water & Sanitation District WWTF (Widefield WWTF), and the Fountain Sanitation District WWTF (Fountain WWTF) developed for the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD) in 2002.

Table 2 contains a summary of the reported self-monitoring data (DMR Data) from 10/01/2005 through 6/30/2010 and the data submitted with the permit application. The application data of a scan for organics, not included in Table 2, showed non-detect for all organics except for total phenolic compounds (0.0046 mg/L) and bis (2-ethylhexyl) phthalate (1.2 ug/L). The self-monitoring data for acute whole effluent toxicity (WET) showed no acute toxicity.

With two exceptions, the data indicated compliance with the effluent limitations in the permit. A maximum ammonia concentration of 20.4 mg/L was reported for the calendar quarter ending 3/31/2010. The daily maximum limitation for March was 18 mg/L. A potentially dissolved iron concentration of 450 ug/L was reported for the calendar quarter ending 12/31/2006. The effluent limitation was 334 ug/L as a 30-day average.

TABLE 2
SUMMARY OF SELF-MONITORING DATA (DMR DATA) & DATA FROM PERMIT APPLICATION

Pollutant or Effluent Characteristic	DMR Data a/		Application Data			
	Average	Maximum	Average	Maximum	# Samples	ML/MDL
Flow, mgd	0.98	3.06	1.09	2.79	1,096	--
BOD_5 mg/L	3.3	22	2.89	25.5	104	2
TSS mg/L	3.2	20.4	2.05	20.4	105	0.5
Oil and Grease mg/L	3.1	6.70	1.50	6.7	51	5
pH (s.u.)	6.63 min	7.97 max	6.72 min	7.62 max	--	--
E. coli #/100mL		217	4.83	500	103	1
Total Ammonia as N, mg/L		Maximum for Quarter	2.63	14.0 d/	104	0.02
January		6.3	--	--		
February			--	--		
March			--	--		
April		20.4 d/	--	--		
May			--	--		
June			--	--		
July		7.1	--	--		
August			--	--		
September			--	--		
October		9.8	--	--		
November			--	--		
December			--	--		
Metals & Cyanide, ug/L		Maximum	Average	Maximum	# Samples	ML/MDL
Ag (dis)		0.54	0.02	0.02	4	0.02
As (trec)		--	0.24	0.28	4	0.21
Cd (dis)		0.09 (PD)	0.05 (PD)	0.09 (PD)	4	0.040
Cr (trec)		2.7 (trec)	0.05 (trec)	0.75 (trec)	12	0.50
CrIII (dis)		--	ND (dis)	ND (dis)	4	20
CrVI (dis)		19 (dis) b/	ND (dis)	ND (dis)	4	4.4
Cu (dis)		18.3 (PD)	2.54 (PD)	7.9 (PD)	4	0.2
Fe (trec)		430 (trec)	92 (trec)	190 (trec)	12	22
Fe (PD)		450 (PD)	--70	97	--12	--22
Hg (tot)		0.00079 tot	0.00044	0.00044	4	0.00020
Mn (dis)		61 (PD)	28 (PD)	28 (PD)	4	0.25
Ni (dis)		6.1 (PD)	2.1 (PD)	6.1 (PD)	12	1.3
Pb (dis)		1.3 (PD)	0.35 (PD)	0.6 (PD)	4	0.1
Se (dis)		6 (PD)	2.9 (PD)	5.3 (PD)	4	1.0
Zn (dis)		81.6 (PD)	50 (PD)	66 (PD)	4	4.5
Cyanide		--	1.4	5.3	4	0.0024
WET, Acute c/	None	None	None	None	4	

a/ Self-monitoring data for 10/01/2005 through 6/30/2010

b/ Sample collect 7/10/2007, lab sheet note said "exceeded holding time". The 19 ug/L value was reported on the DMR. A sample collected 7/25/2007 had a reported concentration of ND.

c/ WET, Acute means whole effluent toxicity, acute.

d/ The 20.4 mg/L concentration was reported after the submission of the permit application.

NOTE: (PD) means potentially dissolved, (trec) means total recoverable, (dis) means dissolved, and (tot) means total.

Receiving Waters

Clover Ditch, the receiving water for the discharge from Outfall 001, appears to be a naturally occurring ephemeral drainageway that may have been partially modified for the purpose of conveying irrigation water when the site was farm land. Clover Ditch flows into Fountain Creek slightly over one mile downstream of Outfall 001. Fountain Creek is a tributary of the Arkansas River. The last modification of the water quality standards for the Arkansas River Basin occurred on January 10, 2011, with an effective date of June 30, 2011. In terms of stream classification by the Colorado Water Quality Control Commission, Clover Ditch is in Segment 4 of the Fountain Creek Basin (COARFO04), which includes all tributaries to Fountain Creek which are not within the boundaries of National Forest or Air Force Academy lands, including all wetlands, lakes and reservoirs, from a point immediately above the confluence with Monument Creek to the confluence with the Arkansas River, except for the specific listings in segments 5, 6 and 7. Segment 4 is designated use protected and is classified Warm Water Aquatic Life Class 2, Recreation Class E, and Agriculture. The numeric standards are given below.

Physical and Biological: Dissolved Oxygen = 5.0 mg/L minimum, pH = 6.5-9.0, *E. Coli* = 126/100mL.
Inorganic, mg/L: Free Cyanide (ac) = 0.2, Boron (ch) = 0.75, Nitrite = 10, Nitrate = 100.
Metals, ug/L: Arsenic (ch) = 100(Trec), Beryllium (ch) = 100(Trec), Cadmium (ch) = 10(Trec), Chromium(+3) (ch) = 100(Trec), Chromium(+6) (ch) = 100(Trec), Copper (ch) = 200(Trec), Lead (ch) = 100(Trec), Nickel (ch) = 200(Trec), Selenium (ch) = 20(Trec), Zinc (ch) = 2000(Trec). Temporary modification type (i): NH_3(ac/ch) = TVS (old). Expiration date of 12/31/2012.
Abbreviations: (ac) = acute (1-day), (dis) = dissolved, (ch) = chronic (30-day), (Trec) = total recoverable.
Note: The standards for inorganics and metals are based on the agricultural classification.

The main stem of Fountain Creek from a point immediately above the confluence with Monument Creek to a point immediately above the State Highway 47 Bridge (near Pueblo) is Stream Segment 2a of the Fountain Creek Basin (COARFO02a) and is classified Warm Water Aquatic Life Class 2, Recreation Class E, Agriculture, and Water Supply. This segment now is undesignated and is subject to antidegradation review. The numeric standards for this segment are given below.

Physical and Biological: Dissolved Oxygen = 5.0 mg/L minimum, pH = 6.5-9.0, E. Coli = 126/100mL
Inorganic, mg/L: NH_3 (ac/ch) = TVS, Chlorine (ac) = 0.019, Chlorine (ch) = 0.011, Free Cyanide = 0.005, Sulfide = 0.002, Boron (ch) = 0.75, Nitrite = 1.0, Nitrate = 10, Chloride = 250, Sulfate = 330. The old TVS for ammonia apply until 12/31/2012.

Metals, ug/L: Arsenic (ac) = 340, As (ch) = 0.02 – 10(Trec), Cadmium (ac/ch) = TVS, Chromium(+3) (ac) = 50(Trec), Chromium(+6) (ac/ch) = TVS, Copper (ac/ch) = TVS, Iron (ch) = WS(dis), Iron (ch) = 1000(Trec), Lead (ac/ch) = TVS, Manganese (ac/ch) = TVS, Manganese (ch) = WS(dis), Mercury (ch) = 0.01(tot), Nickel (ac/ch) = TVS, Selenium (ac) = TVS, Selenium (ch) = 8, Silver (ac/ch) = TVS, Zinc (ac/ch) = TVS. For Cu (ac/ch) the current condition applies until 12/31/2012.

Abbreviations: (ac) = acute (1-day), (dis) = dissolved, (ch) = chronic (30-day), (Trec) = total recoverable, TVS = table value standard.

Note: Because there are no water supplies located on Fountain Creek downstream of the confluence with Clover Ditch, the chronic total recoverable arsenic standard for water supplies is not applied. Instead, the agricultural standard for total recoverable arsenic, 100 ug/L, will apply. Likewise, the water supply based standards for dissolved iron, dissolved manganese, and sulfates do not apply. The aquatic life standard for dissolved manganese does apply.

Water Quality Considerations

NOTE: Because Segment 2a of the Fountain Creek basin (COARFO02a) is unclassified, it is necessary to an antidegradation evaluation in addition to determining water quality based effluent limitations (WQBELs) to comply with the applicable WQS. Determining WQBELs is complicated by the fact that there are five significant dischargers to segment COAARFO02a; Colorado Springs Utilities Las Vegas WWTF, Security Sanitation District WWTF, U.S. Army – Fort Carson WWTF, Widefield Water & Sanitation District WWTF, and Fountain Sanitation District WWTF. It is not necessary to do an antidegradation evaluation for Clover Ditch because Segment COARFO04 is designated use protected.

In a letter of August 19, 2008, the CDPHE transmitted to Fort Carson the Proposed Preliminary Effluent Limits (PELs) for the WWTF at Fort Carson. Those effluent limitations were developed for use by Fort Carson in its application for site approval for the upgrading of the WWTF. In addition to the effluent limits required by Regulation No. 62 (Regulations for Effluent Limitations), the PELs included water quality based effluent limits considered necessary for protection of water quality in Clover Ditch and the applicable portions of Fountain Creek. However, since then some of the values in the PELs have changed due to a water quality assessment of Fountain Creek by the CDPHE. That assessment is titled "Water Quality Assessment, Fountain Creek, Colorado Springs Utilities Las Vegas WWTF, Security Sanitation District WWTF, US Army-Fort Carson WWTF, Widefield Water & Sanitation District WWTF, Fountain Sanitation District WWTF," (WQA) and was last revised 12/10/2010.

The WQA was prepared for the renewal of the permits for the Security, Widefield, and Fountain WWTFs. Portions of the WQA were not complete for Colorado Springs and Fort Carson WWTFs in that it did not include new or increased impacts, concentration significance tests, and final antidegradation (AD) limits tables and evaluations in the AD section of the WQA. Also, water quality based effluent limitations (WQBELs) were not calculated for Clover Ditch. However, between the PELs and the WQA, there is sufficient information to determine the appropriate potential effluent limitations for the Fort Carson WWTF. When values differed between the WQA and the PELs, except as noted, the WQA values were carried forward for determining proposed permit limits because the WQA was completed more recently than the PELs.

NOTE: The process of determining the WQBELs and doing the antidegradation evaluation is complicated. To see how values were determined it is necessary to refer to the above two documents, i.e., the WQA and the PELs for the Fort Carson WWTF. This statement of basis only shows part of the process and does not include specifics on the calculations, etc.

The WQA listed the following parameters as being identified by the WQCD as pollutants of concern for these facilities: total residual chlorine (except for Fort Carson WWTF); *E. coli*; ammonia; temperature; metals and cyanide; pH; BOD_5 and $CBOD_5$; TSS; oil & grease; and nonylphenol. Section 2a of Fountain Creek is listed in Colorado's section 303(d) listing of impaired streams as exceeding the *E. coli* standard, so there is no assimilative capacity for *E. coli* at this time. According to the WQA the effluent limitations for all facilities will be set to the stream standard of 126 #/100 mL until future allocations from a TMDL might divide the WLA for the WWTFs differently. The ambient water quality for Fountain Creek is given in Table A-6 of the WQA. In addition to *E. coli*, it shows that the ambient water quality for total recoverable iron and total mercury exceed the applicable WQS for Fountain Creek. Accordingly, the WQBELs for total recoverable iron and total mercury will be set equal to the respective WQS. Because the ambient water quality for *E. coli*, total recoverable iron and total mercury exceed the WQS, it is not necessary to do the antidegradation evaluation for these three pollutants. Because the Fort Carson WWTF does not use chlorine for disinfection, it is not necessary to calculate chlorine limitations for that facility.

The calculations of WQBELs for the remaining metals of concern, cyanide, and nonylphenol were based on a mass balance using the ambient water quality and the appropriate low flows in Fountain Creek upstream of the Colorado Springs WWTF and the sum of the design flows for the five facilities (133cfs). For the acute toxicity WQS, the 1-day low flow over a 3-year period (1E3) (5.9 cfs) was used. For the chronic toxicity WQS, the 30-day low flow over a 3-year period (30E3) (12 cfs) was used. The values used in the calculation of the WQBELs for all five facilities are given in Table A-7a (Chronic WQBELs) and Table A-7b (Acute WQBELs) of the WQA.

In addition to the WQBE Ls, it is necessary to consider antidegradation for discharges to Segment 2a of Fountain Creek. The process is complicated and is given in Section VII, Antidegradation Evaluation, of the WQA. Part of the evaluation includes in determining the antidegradation based average concentrations (ADBAC) where appropriate. The ADBAC is the highest average effluent discharge level that results in insignificant degradation of downstream water quality. The determination of the ADBAC includes the baseline water quality (BWQ), which is the fully mixed condition below a discharge that was in place prior to September 30, 2000. The BWQ concentrations used in determining the ADBAC metals values are given in Tables A-10a and A-10c of the WQA. Table A-11a of the WQA includes the calculated ADBAC values for *E. coli*, TRC, metals, and cyanide. Except for *E. coli*, total recoverable iron, total mercury, and dissolved selenium, the ADBAC values appear to be correct based on available information. However, it is this writer's opinion that since the ambient concentrations of *E. coli*, total recoverable iron and total mercury exceed their respective WQS, the ADBAC values should not be calculated as there is no excess capacity for degradation. The same applies for selenium since the BWQ value of 8.9 ug/L exceeds the site specific WQS of 8.0 ug/L. It is this writer's opinion that the Q1 value for As, TR in Table A-11a should be 12 cfs, not 5.9 cfs, because the WQS of 100 ug/L for total recoverable arsenic is a 30-day average value. However, the State did use 12 cfs in its calculations. Also, it appears that the M1 values listed in Table A-11a are the ambient water quality values instead of the BWQ values. However, it appears that except for *E. coli*, iron, mercury, and selenium the BWQ values were used in calculating the ADBAC values.

The calculated WQBELs from Tables A-7a and A-7b and ADBACs (except for *E. coli*, iron, mercury, and selenium) from Table A-11a are given in Table 3 below.

TABLE 3
WQBELs & ADBACs FOR *E. COLI*, METALS,CYANIDE AND NONYLPHENOL

Parameter	Chronic WQBEL	Acute WQBEL	Notes	ADBAC
E. coli (#/100 mL)	126	N/A	1	N/A
As, TR (ug/L)	109	N/A		19
As, Dis (ug/L)	N/A	355		53
Cd. Dis (ug/L)	1.0	7.3		0.26
Cr^{+3}, TR (ug/L)	N/A	52		9.9
Cr^{+6}, Dis (ug/L)	12	17		1.9
Cu, Dis (ug/L)	25	39		7.5
CN, Free (ug/L)	N/A	5.2		0.78
Fe, TR (ug/L)	1,000	N/A	1	N/A
Pb, Dis (ug/L)	8.7	214		1.6
Mn, Dis (ug/L)	2,575	4469		398
Hg, Tot (ug/L)	0.01	N/A	1	N/A
Ni, Dis (ug/L)	142	1221		29
Se, Dis (ug/L)	8.3	19		N/A
Ag, Dis (ug/L)	2.3	14		0.35
Zn, Dis (ug/L)	340	376		75
Nonylphenol (ug/L)	7.2	29	2	N/A

Note 1: The existing water quality for this parameter exceeds the water quality standard and the WQBEL was set at the water quality standard to prevent further deterioration of water quality. Furthermore, the ADBAC cannot be calculated for this parameter and it is not necessary to do the antidegradation evaluation.
Note 2: According to the WQA there are no data for nonylphenol for the facilities evaluated by the WQA. Time will be allowed for the facilities to monitor for nonylphenol and collect data to determine what an implicit limitation would be.

The new WQS for ammonia do not go into effect until 01/01/2013 and in the interim the effluent limitations based on the old WQS are in effect. The results of the AMMTOX analysis for ammonia limits for the discharge from the Fort Carson WWTF are given in Table A-8d of the WQA. The antidegradation based average concentrations (ADBACs) for the Fort Carson WWTF are given in Table A-11e of the WQA. The interim effluent limitations, WQBELs, and the ADBACs on total ammonia for the Fort Carson WWTF are given in Table 4 below.

TABLE 4 - INTERMIM, WQBELs and ADBACs LIMITATIONS ON TOTAL AMMONIA for FORT CARSON WWTF

	Limitations on Total Ammonia, mg/L				
	Interim Limitations Until 12/31/2012		WQBELs Effective 01/01/2013		ADBACs
Month	30-Day Average	Daily Maximum	30-Day Average	Daily Maximum	2-Year Average
January	N/A	N/A	13	14	2.0
February	13.6	N/A	14	21	2.4
March	12.5	18	15	23	2.6
April	20	N/A	9.2	22	1.6
May	23	N/A	9.4	20	1.6
June	28	N/A	9.3	23	1.6
July	N/A	N/A	10	27	1.7
August	N/A	N/A	10	26	1.7
September	N/A	26	11	24	1.8
October	N/A	N/A	10	19	1.7
November	N/A	N/A	10	16	1.8
December	N/A	N/A	11	15	2.0

As part of the antidegradation review it is necessary to make a comparison of the new WQBELs concentrations and loadings versus the concentrations and loadings as of September 30, 2000. It should be noted that the design flow of the Fort Carson WWTF on September 30, 2000 is the same as the design flow for this renewal permit. Therefore, it is possible to compare just concentrations based on the WQBELs and the concentrations of permit limits in effect on September 30, 2000 or, in the absence of permit limits the maximum concentrations of a pollutant know to occur then. The September 30, 2000, concentrations are referred to as non-impact limitations (NILs).

The permit for the Fort Carson WWTF issued in 1999 and in effect on September 30, 2000, had effluent limitations on ammonia nitrogen, but it did not have limitations on any metals. However, the State of Colorado's 2008 determinations of PELs for the Fort Carson WWTF contained NILs for hexavalent chromium, copper, manganese, lead, selenium, and zinc.

A summary of the determination of new or increased water quality impacts for the Fort Carson WWTF is given in Table 5 below. There would not be an increased impact for TRC and for the ammonia nitrogen limitations for the months of April, May, and November. The reason there is no increased impact for TRC is because chlorination is no longer used for disinfection at the Fort Carson WWTF.

TABLE 5
DETERMINATION OF NEW OR INCREASED IMPACTS FOR FORT CARSON WWTF

Pollutant	Sept 2000 Permit Limit	NIL 30-day Avg.	New WQBEL		New or Increased Impact
			30-day Avg.	Daily Max.	
E. coli (#/100 mL)	a/	64 a/	126 (geomean)	252 (7-day geomean)	Yes
TRC, (mg/L)	0.08	N/A	N/A	N/A	No
NH_3 Tot (mg/L) Jan	10	10	13	14	Yes
NH_3 Tot (mg/L) Feb	10	10	14	21	Yes
NH_3 Tot (mg/L) Mar	10	10	15	23	Yes
NH_3 Tot (mg/L) Apr	10	10 c/	9.2	22	No
NH_3 Tot (mg/L) May	10	10 c/	9.4	20	No
NH_3 Tot (mg/L) Jun	8	8	9.3	23	Yes
NH_3 Tot (mg/L) Jul	8	8	10	27	Yes
NH_3 Tot (mg/L) Aug	8	8	10	26	Yes
NH_3 Tot (mg/L) Sep	8	8	11	24	Yes
NH_3 Tot (mg/L) Oct	8	8	10	19	Yes
NH_3 Tot (mg/L) Nov	10	10	10	16	No
NH_3 Tot (mg/L) Dec	10	10	11	15	Yes
As, TR (ug/L)	N/A	N/A	109	N/A	Yes
As, Dis (ug/L)	N/A	N/A	N/A	355	Yes
Cd. Dis (ug/L)	N/A	5 b/ c/	1.0	7.3	No
Cr^{+3}, TR (ug/L)	N/A	N/A	N/A	52	Yes
Cr^{+6}, Dis (ug/L)	N/A	6.0 b/	12	17	Yes
Cu, Dis (ug/L)	N/A	16 b/	25	39	Yes
CN, Free (ug/L)	N/A	N/A	N/A	5.2	Yes
Fe, TR (ug/L)	N/A	1,830 b/ c/	1,000	N/A	No
Pb, Dis (ug/L)	N/A	6.0 b/	8.18.7	8.7214	Yes
Mn, Dis (ug/L)	N/A	48 b/	2,575	2144469	Yes
Hg, Tot (ug/L)	N/A	0.2 b/ c/	0.01	N/A	No
Ni, Dis (ug/L)	N/A	210 b/ c/	142	1221	No
Se, Dis (ug/L)	N/A	6.0 b/	8.3	19	Yes
Ag, Dis (ug/L)	N/A	5 b/ c/	2.3	14	No
Zn, Dis (ug/L)	N/A	51 b/	340	376	Yes
Nonylphenol (ug/L)	N/A	N/A	7.2	29	Yes

a/ The effluent limitations in September 2000 were on fecal coliform and were 200/100 mL as a 30-day geometric mean and 400/100 mL as a 7-day geometric mean. In accordance with the State's policy regarding *E. coli*, an implicit limit for *E. coli* is determined as 0.32 times the permit limit for fecal coliform.

b/ Based on the Preliminary Effluent Limits, Appendix A, Clover Ditch and Fountain Creek, Proposed Rehabilitation and Improvements to US Army-Fort Carson WWTF, Table A-14, page 22 of 25.

c/ If the non-impact limit (NIL) is greater than the WQBEL, then the NIL should be set equal to the WQBEL.

The next step in the antidegradation evaluation is the concentration significance determination test, which considers the cumulative impact of the discharges over the baseline condition. In order to be insignificant, the new or increased discharge may not increase the actual instream concentration by more

than 15% of the available increment over the baseline condition. For *E. coli*, TRC, metals, and cyanide, the insignificant level is the ADBAC value given in Table A-11a of the WQA. The calculated ADBAC values for ammonia for the Fort Carson WWTF are given in Table A-11e of the WQA. If the WQBEL is greater than the ADBAC, an antidegradation limit would be applied.

The significant test for the Fort Carson WWWTF is summarized in Table 6 below. The test is not applicable for TRC because the Fort Carson WWTF does not use chlorination for disinfection. The test is not applicable for *E. coli*, total recoverable iron, and total mercury because the ambient water quality exceeds the WQS for those pollutants. (See Q & A 22 on page 32 of "Antidegradation Significance Determination for New or Increased Water Quality Impacts, Procedural Guidance", Version 1.0, December 2001, updated with a memorandum of April 23, 2002.) Of the other pollutants, selenium was the only one that did not have a significant impact.

After the significance test, the next step is the selection of limitations. The antidegradation based effluent limitation (ADBEL) is defined as the potential limitation resulting from the antidegradation evaluation, and may be either the ADBAC or the NIL unless the WQBEL is more stringent than either the ADBAC or the NIL. When an ADBAC or NIL applies, the permittee has the final choice between the two limitations. A NIL is applied as a 30-day average limitation (the acute WQBEL would also apply where applicable) while the ADBAC would be applied as a 2-year rolling average concentration. For the purpose of this statement of basis, the EPA has made an attempt to determine whether the NIL or ADBAC will apply.

TABLE 6
CONCENTRATION SIGNIFICANCE TEST FOR FORT CARSON WWTF

Pollutant	New WQBEL (30-Day Avg.)	ADBAC (2-Yr. Avg.)	Concentration Test Result
E. coli, #/100 mL	126	N/A	N/A
TRC, (mg/L)	N/A	N/A	N/A
NH_3 Tot (mg/L) Jan	13	2.0	Significant
NH_3 Tot (mg/L) Feb	14	2.4	Significant
NH_3 Tot (mg/L) Mar	15	2.6	Significant
NH_3 Tot (mg/L) Apr	9.2	1.6	Significant
NH_3 Tot (mg/L) May	9.4	1.6	Significant
NH_3 Tot (mg/L) Jun	9.3	1.6	Significant
NH_3 Tot (mg/L) Jul	10	1.7	Significant
NH_3 Tot (mg/L) Aug	10	1.7	Significant
NH_3 Tot (mg/L) Sep	11	1.8	Significant
NH_3 Tot (mg/L) Oct	10	1.7	Significant
NH_3 Tot (mg/L) Nov	10	1.8	Significant
NH_3 Tot (mg/L) Dec	11	2.0	Significant
As, TR (ug/L)	109	19	Significant
As, Dis (ug/L)	355 a/	53	Significant
Cd. Dis (ug/L)	1.0	0.26	Significant
Cr^{+3}, TR (ug/L)	52	9.9	Significant
Cr^{+6}, Dis (ug/L)	12	1.9	Significant
Cu, Dis (ug/L)	25	7.5	Significant
CN, Free (ug/L)	5.2	0.78	Significant
Fe, TR (ug/L)	1,000	N/A	N/A
Pb, Dis (ug/L)	8.1	1.6	Significant
Mn, Dis (ug/L)	2,575	398	Significant
Hg, Tot (ug/L)	0.01	N/A	N/A
Ni, Dis (ug/L)	142	29	Significant
Se, Dis (ug/L)	8.3	N/A	N/A
Ag, Dis (ug/L)	2.3	0.35	Significant
Zn, Dis (ug/L)	340	75	Significant

a/ Daily maximum limitation based on acute toxicity.

Table 7 below lists the applicable NIL, WQBEL and ADBAC and the chosen limit of the three categories. For *E. coli*, total recoverable iron, and total mercury the WQBEL was chosen because the ambient water quality exceeds the WQS for those pollutants. For selenium the chosen limit was the WQS, 8.0 ug/L, because the baseline water quality exceeds the WQS. It should be noted that the chosen limit will not necessarily be an effluent limitation in the permit. It is necessary to do a reasonable potential evaluation for the various pollutants to determine if an effluent limitation is appropriate for that pollutant.

TABLE 7
FINAL SELECTION OF WQBELs, NILs & ADBAC FOR FORT CARSON WWTF

Pollutant	NIL (30-Day Avg.)	New WQBEL (30-Day Avg.)	ADBAC (2-Yr. Avg.)	Chosen Limit
E. coli, #/100 mL	N/A e/	126	N/A e/	WQBEL
TRC, (mg/L)	N/A e/	N/A e/	N/A e/	N/A e/
NH_3 Tot (mg/L) Jan	10	13	2.0	NIL
NH_3 Tot (mg/L) Feb	10	14	2.4	NIL
NH_3 Tot (mg/L) Mar	10	15	2.6	NIL
NH_3 Tot (mg/L) Apr	10	9.2	1.6	WQBEL
NH_3 Tot (mg/L) May	10	9.4	1.6	WQBEL
NH_3 Tot (mg/L) Jun	8	9.3	1.6	NIL
NH_3 Tot (mg/L) Jul	8	10	1.7	NIL
NH_3 Tot (mg/L) Aug	8	10	1.7	NIL
NH_3 Tot (mg/L) Sep	8	11	1.8	NIL
NH_3 Tot (mg/L) Oct	8	10	1.7	NIL
NH_3 Tot (mg/L) Nov	10	10	1.8	NIL
NH_3 Tot (mg/L) Dec	10	11	2.0	NIL
As, TR (ug/L)	NA d/	109	19	ADBAC
As, Dis (ug/L)	NA d/	355 a/	53	ADBAC
Cd. Dis (ug/L)	5.0 b/	1.0	0.26	ADBAC
Cr^{+3}, TR (ug/L)	NA d/	52	9.9	ADBAC
Cr^{+6}, Dis (ug/L)	6.0 b/	12	1.9	NIL
Cu, Dis (ug/L)	16 b/	25	7.5	NIL
CN, Free (ug/L)	NA d/	5.2	0.78	ADBAC
Fe, TR (ug/L)	1,830 b/	1,000	N/A e/	WQBEL
Pb, Dis (ug/L)	6.0 b/	8.1	1.6	NIL
Mn, Dis (ug/L)	48 b/	2,575	398	ADBAC
Hg, Tot (ug/L)	0.2 b/	0.01	N/A e/	WQBEL
Ni, Dis (ug/L)	210 b/	142	29	WQBEL
Se, Dis (ug/L)	N/A e/	8.3	N/A e/	8.0 c/
Ag, Dis (ug/L)	5 b/	2.3	0.35	WQBEL
Zn, Dis (ug/L)	51 b/	340	75	ADBAC

a/ Daily maximum limitation based on acute toxicity.
b/ Based on the State's PELs for Fort Carson's WWTF.
c/ Based on WQS since the baseline water quality exceeds the WQS of 8.0 ug/L.
d/ Not available or undetermined.
e/ Not applicable

Potential Effluent Limitations and Reasonable Potential Analysis

The State's "Regulation of Effluent Limitations", Regulation No. 62, includes technology based effluent limitations on BOD_5, total suspended solids (TSS), oil and grease, pH and the maximum limitation on total residual chorine (TRC) that are applicable to municipal wastewater treatment facilities and would be applicable to the Fort Carson WWTF. The water quality based limitation on pH, 6.5 – 9.0, is more stringent than the technology based limitation of 6.0 – 9.0, and will be used in the permit. The technology based limitations on BOD_5 (30 mg/L 30-day average, 45 mg/L 7-day average, and 85% removal) are considered adequate to comply with applicable WQS. An effluent limitation on TRC is not

necessary since chlorine is not used for disinfection purposes at the Fort Carson WWTF. The effluent limitations on *E-Coli* will be 126 organisms/100 mL as a 30-day geometric mean and 252 organisms per 100 mL as a 7-day geometric mean. The 30-day limitation is based on WQS and the 7-day limitation is based on the State's policy of the 7-day limitation being 2 times the 30-day limitation.

Effluent limitations on ammonia are necessary to comply with WQS. Since the old table value standards for ammonia apply until 12/31/2012, the effluent limitations on ammonia in the previous permit will apply until then. The water quality based effluent limitations (WQBELs) on ammonia, based on the new standards, will be effective 1/1/2013 and the chosen limits on ammonia from Table 7 will be effective at the beginning of the first month following two years after the effective date of the permit. The effluent limitations on ammonia and the effective dates are shown below in Table 8. The more stringent of the new WQBEL or the applicable ADBAC/NIL applied to each month as the limits effective after 2 years to meet the antidegradation requirements. The daily maximum limitations effective then are the same as the WQBELs effective 1/1/2013.

TABLE 8 - LIMITATIONS ON TOTAL AMMONIA, mg/L, and EFFECTIVE DATES

	Interim Limitations Until 12/31/2012		WQBELs Effective 01/01/2013		Effective 2 Years after Effective Date of Permit	
Month	30-Day Average	Daily Maximum	30-Day Average	Daily Maximum	30-Day Average	Daily Maximum
January	N/A	N/A	13	14	10	14
February	13.6	N/A	14	21	10	21
March	12.5	18	15	23	10	23
April	20	N/A	9.2	22	9.2	22
May	23	N/A	9.4	20	9.4	20
June	28	N/A	9.3	23	8	23
July	N/A	N/A	10	27	8	27
August	N/A	N/A	10	26	8	26
September	N/A	26	11	24	8	24
October	N/A	N/A	10	19	8	19
November	N/A	N/A	10	16	10	16
December	N/A	N/A	11	15	10	15

The potential effluent limitations on the metals and cyanide and the effective dates are shown in Table 9 below. It should be noted that only monitoring for nonylphenol will be required in this renewal permit, with no effluent limitations. The effective date of the WQS for nonylphenol is January 1, 2011. However, because of concerns that were expressed by major municipal dischargers related to potential difficulty of testing, measuring and controlling nonylphenol and its precursors, the Water Quality Control Commission expected the normal permitting process would be followed (i.e., effluent limits would not normally be imposed during the initial round of permit renewals, but monitoring would be required as a first step.) The daily maximum limitations effective 2 years after the effective date of the permit are the same as the daily maximum limitations effective immediately.

TABLE 9 – POTENTIAL EFFLUENT LIMITATIONS ON METALS and CYANIDE

	Effective Immediately		Effective 2 Years After Effective Date of the Permit		
Pollutant, ug/L	30-Day Average	Daily Maximum	30-Day Average	2-Year Average	Daily Maximum
Arsenic, TR	109	N/A	N/A	19	N/A
Arsenic, Dis.	N/A	355	N/A	53	355
Cadmium, Dis.	1.0	7.3	1.0	N/A	7.3
Chromium $^{+3}$, TR	N/A	52	N/A	9.9	52
Chromium $^{+6}$, Dis.	12	17	6.0	N/A	17
Copper, Dis.	25 a/	39 a/	16	N/A	39
Cyanide, Free	N/A	5.2	N/A	0.78	5.2
Iron, TR	1,000	N/A	1,000	N/A	N/A
Lead, Dis.	8.1	214	6.0	N/A	214
Manganese, Dis.	2,575	4,446	N/A	398	4,446
Mercury, Total	0.01	N/A	0.01	N/A	N/A
Nickel, Dis.	142	1221	142	N/A	1221
Selenium, Dis.	8.0	19	8.0	N/A	19
Silver, Dis.	2.3	14	2.3	N/A	14
Zinc, Dis.	340	376	N/A	75	376

a/ Limitations on copper effective 01/01/2013 because the new criteria for copper do not go into effect until then. Previous permit did not have a limitation on copper.

In order to have a better understanding of the variability of the data for metals and cyanide (weak acid dissociable), individual laboratory reports for the period July 2007 – October 2010 were obtained from the permittee. The analytical results are tabulated in Table 10. The method detection levels (MDL) and the reporting levels (RL) (also known as practical quantitation limit (PQL)) used by the laboratory are given in the second and third rows of the table. The maximum expected pollutant concentration (MEPC) was calculated for those pollutants where there were sufficient data and the results are listed in the bottom row of Table 10. The MEPCs were calculated using Region 8's reasonable potential analysis and in accordance with the State's practice, it was assumed that the data had a lognormal distribution and a 99% confidence interval was used. There were insufficient data for cyanide, arsenic, cadmium, hexavalent chromium, and silver to calculate the MEPC.

The analytical results for cyanide and hexavalent chromium are puzzling in that they are not expected to be present in the effluent considering the sources of the influent, the very high level of treatment provided, and the fact that these two compounds are not stable in that type of treatment system. Their apparent presence may be due to analytical problems at low concentrations when analyzing an effluent from a sewage treatment plant. Because of the uncertainty over the actual concentrations and the low effluent limitations based on the ADBAC values, the permit will have self-monitoring requirements with specified PQLs, but will not have effluent limitations for WAD cyanide and hexavalent chromium.

The data for arsenic in Table 10 is for total recoverable arsenic and there are no data for dissolved arsenic. However, the data for total recoverable arsenic should include any dissolved arsenic that may have been present. There are insufficient data for arsenic to do a reasonable potential analysis. However, of the 9 samples analyzed for arsenic, there were 4 detections of arsenic, with the highest value being 0.58 ug/L. There were 5 non-detections, 4 of them when the MDL was 4.4 ug/L. The 4.4 ug/L MDL value is approximately 28% of the 2-year average antidegradation limitation of 19 ug/L for total

recoverable arsenic and approximately 8% of the 2-year average antidegradation limitation of 53 ug/L for dissolved arsenic. It is this writer's professional opinion that it is highly unlikely that the 2-year average limitations for either dissolved or total recoverable arsenic would be exceeded. Therefore, the permit will not contain effluent limitations and monitoring requirements for either total recoverable arsenic or dissolved arsenic.

Of the 13 reported results for cadmium listed in Table 10, there were only 3 results that were above the MDL of 0.04 ug/L, with the highest value of 0.09 ug/L. The remaining DMR data for the five year period of the permit were reported as non-detection. There are insufficient data to do a reasonable potential analysis. The large number on non-detections (17 out of 20 samples) and the highest detected value being 0.09 ug/L, implies that cadmium is not of concern. The permit will not have any effluent limitations for cadmium, but will have monitoring requirements to obtain additional data.

Of the 36 results for total recoverable chromium, there were only 10 detections, with the highest reported value being 2.7 ug/L. That is only about 27 percent of the 2-year average ADBAC limitation of 9.9 ug/L and only 5.2 % of the daily maximum limitation of 52 ug/L.

A reasonable potential analysis using the 10 detected concentrations of total recoverable chromium gave a maximum expected pollutant concentration of 7.5 ug/L. The 7.5 ug/L value is significantly less than half the daily maximum limitation of 52 ug/L. The rolling 2-year average concentration should be significantly less than the 2-year average limitation 9.9 ug/L. The permit will not have any limitations or monitoring requirements for trivalent chromium or total recoverable chromium.

Using extra DMR data for copper not shown in Table 10, the reasonable potential analysis gave a MEPC of 63 ug/L, which is greater than all of the potential effluent limitations. Effluent limitations and monitoring requirements for copper will be included in the permit.

The MEPC for total recoverable iron is 270 ug/L and the 30-day average effluent limitation is 1,000 ug/L. There is not a reasonable potential for the 1,000 ug/L limitation to be exceeded and the permit will not have any effluent limitations or monitoring requirements for total recoverable iron. The previous permit had an effluent limitation on potentially dissolved iron based on the water supply classification on this segment of Fountain Creek. As pointed out in the WQA, no water supply use is currently identified for this stream segment. Therefore, in accordance with the WQCD's policy, the water supply based criteria currently do not apply to this stream segment. Therefore, the permit will not have an effluent limitation or monitoring requirements for potentially dissolved iron.

For lead the MEPC is 1.5 ug/L and there is not a reasonable potential for the 30-day average limitation of 6.0 to be exceeded. Therefore, the permit will not have effluent limitations or monitoring requirements for lead.

The MEPC for potentially dissolved manganese is 110 ug/L and there is not reasonable potential for the 2-year average limitation of 398 ug/L to be exceeded. Therefore, the permit will not have any effluent limitations or monitoring requirements for manganese.

The MEPC for total mercury is 0.0002 ug/L and there does not appear to be a reasonable potential for the 30-day average limitation of 0.01 ug/L to be exceeded. Therefore, the permit will not have effluent limitations on mercury. However, the permit will require quarterly monitoring for total mercury using the low level of analysis.

The MEPC for potentially dissolved nickel is 11 ug/L and there does not appear to be a reasonable potential for the 30-day average limitation of 142 ug/L to be exceeded. Therefore the permit will not have effluent limitations or monitoring requirements for nickel.

The MEPC for selenium is 14 ug/L, which is greater than the 30-day average limitation of 8.0 ug/L. The permit will have effluent limitations for selenium of 8.0 ug/L as a 30-day average and 19 ug/L as a daily maximum, and monitoring requirements.

The data for silver are inadequate to make a decision about the need for effluent limitations. During a five year period (20 reporting quarters), silver was detected (0.02 ug/L MDL) in only three out of 20 quarters and all three values were less than the reporting limit of 1 ug/L. The large number of no detections and the low concentrations in the three sample where silver was detected implies that silver is not a concern. The permit will not have any effluent limitations on silver, but will contain monthly monitoring requirements to obtain additional data.

The MEPC for potentially dissolved zinc is 130 ug/L and there does not appear to be a reasonable potential to exceed the chronic toxicity limitation of 340 ug/L nor the acute toxicity limitation of 376 ug/L. Using the data in Table 10 and data reported for other quarters, the rolling 2-year average concentrations for zinc were determined. Using that data, a reasonable potential analysis was done. The MEPC 2-year average concentrations was determined to be 71.4 ug/L. That is slightly less than the rolling 2-year average limitation, so the permit will not contain any effluent limitations on zinc, but will contain monthly monitoring requirements for the 2-year rolling average concentration of zinc.

TABLE 10 - CYANIDE AND SELECTED METALS MONITORING DATA FOR JULY 2007 – OCTOBER 2010

Date	CN (AD)	As (TR)	Cd (PD)	Cr (TR)	Cr (Hex)	Cu (PD)	Fe (PD)	Fe (TR)	Pb (PD)	Mn (PD)	Hg (Tot)	Ni (PD)	Se (PD)	Ag (Pd)	Zn (PD)
MDL	*2-2.4*	*0.21-4.4*	*0.04*	*0.5-1*	*4-4.4*	*0.2*	*22*	*22*	*0.1*	*0.25-1.8*	*0.0002*	*1.3*	*1*	*0.02*	*4.3*
RL	*10*	*5-15*	*1*	*1-2*	*10*	*1*	*100*	*100*	*1*	*10*	*0.0005*	*40*	*5*	*1*	*20*
Oct 10				ND			57	46				1.3			
Sep 10				ND			71	69			0.0002				
Aug 10				ND			92	100				1.6			
Jul 10	4.6	ND	ND	ND	7.8	2.3	67	84	0.32	41		1.9	2.6	ND	78
Jun 10				ND			70	80				1.3			
May 10											0.00079				
Apr 10	3.5	ND	0.052	ND	ND	3	74	73	0.37	32		2	2.4	0.028	68
Mar 10											0.00059				
Feb 10				0.65			63	89				2.5			
Jan 10	ND	ND	ND	0.73	ND	2.5	69	89	0.41	29		2.8	1.7	ND	56
Dec 09				ND			66	88				1.8			
Nov 09	5.3	0.28	0.09	ND	ND	7.9	97	120	0.25	31	0.00044	2	5.3	0.02	39
Oct 09				0.62			87	94				1.7			
Sep .09															
Aug 09				ND			89	90				1.7			
Jul 09	3	ND	ND	0.75	ND	0.97	62	190	0.26	33		1.6	3.3	ND	47
Jun 09											0.0005				
May 09				ND			64	67				ND			
Apr 09	ND	ND	ND	ND	ND	1.3	72	95	0.29	31		1.6	ND	ND	48
Mar 09				ND			87	70			0.0002	6.1			
Feb 09				ND			60	59				1.7			
Jan 09	3.6	0.26	ND	ND	ND	1.5	ND	74	0.6	17		ND	1.9	ND	66
Dec 08				2.7			56	64				ND			
Nov 08	ND	0.58	ND	ND	4.5	2.3	ND	42	0.3	23	0.0002	1.4	4.3	ND	77
Oct 08				ND			50	72				ND			
Sep 08				ND			ND	48			0.0002	ND			
Aug 08				ND			55	75				2.9			
Jul 08			ND	ND	ND	1.3	63	59	0.24	28		1.8	1.7	ND	54
Jun 08				ND			46	87			0.0002	3.2			
May 08				ND			50	69				ND			
Apr 08			ND	ND	4.9	1.8	42	78	0.41	35		ND	1.8	ND	80
Mar 08				0.59			65	60			0.00056	ND			
Feb 08				0.55			53	70				ND			67
Jan 08			0.054	0.8	ND	2.5	52	62	0.45	24		ND	1.8	ND	
Dec 07				ND			63	83			0.0002	ND			
Nov 07				ND			55	70				5.3			
Oct 07			ND	ND	ND	4.78	ND	ND	ND	60.6		3.81	6.01	ND	56.2
Sep 07				ND			ND	ND				2.27			
Aug 07				0.37			ND	ND			0.00057	2.19			
Jul 07			ND	0.62	ND	2.31	96.3	104	0.08	20.9	ND	2.68	3.25	0.54	37.3
MEPC	ID	ID	ID	7.5	ID	63 a/	130	270	1.5	110	0.0002	11	14	ID	130

(AD) = Weak Acid dissociable cyanide; (TR) = Total recoverable metal; (PD) = Potentially dissolved metal; (Hex) = Hexavalent chromium; (Tot) = Total mercury. MEPC = Maximum expected pollutant concentration; ND = Not Detected; ID = Insufficient data for calculating MEPC; a/ Based on using extra DMR data not show in table

The WQBELs for metals and cyanide, the applicable ADBAC or NIL limitation effective in two years, and the decision on reasonable potential analyses are given in Table 11 below. As mentioned in the previous discussion, the permit will not have any effluent limitations or monitoring requirements for arsenic, trivalent chromium, iron, lead, manganese, and nickel. The permit will have no effluent limitations for cadmium, hexavalent chromium, weak acid dissociable cyanide, mercury, silver, and zinc, but will have monitoring requirements for these pollutants The permit will have effluent limitations and monitoring requirements for copper and selenium.

TABLE 11
SUMMARY OF REASONABLE POTENTIAL ANALYSES FOR METALS AND CYANIDE

Pollutant, ug/L	WQBELs						ADBAC or NIL		
	30-Day Average			Daily Maximum					
	MEPC	MAPC	RP	MEPC	MAPC	RP	MEPC	ADBAC or NIL	RP
As, TR	ID	109	No a/	ID	N/A	N/A	ID	19	No a/
As, Dis	N/A	N/A	N/A	ID	355	No a/	ID	53	No a/
Cd, Dis	ID	1.0	Monitor	ID	7.3	Monitor	ID	5.0	Monitor
Cr+3, TR	N/A	N/A	N/A	7.5	52	No	7.5	9.9	No
Cr+6, Dis	ID	12	Monitor	ID	17	Monitor	ID	6.0 b/	Monitor
Cu, Dis	63	25	Yes	63	39	Yes	63	16 b/	Yes
CN, Free	N/A	N/A	N/A	ID	5.2	Monitor	ID	0.78	Monitor
Fe, TR	130	1,000	No	130	N/A	No	N/A	N/A	N/A
Pb. Dis	1.5	8.1	No	1.5	214	No	1.5	6.0 b/	No
Mn, Dis	110	2,575	No	110	4,446	No	110	398	No
Hg, Tot	0.0002	0.01	No c/	N/A	N/A	N/A	N/A	N/A	N/A
Ni, Dis	11	142	No	11	1,221	No	11	210	No
Se, Dis	14	8.0	Yes	14	19	Monitor	N/A	N/A	N/A
Ag, Dis	ID	2.3	Monitor	ID	14	Monitor	ID	5	Monitor
Zn, Dis	130	340	No	130	376	No	71.4	75	Monitor

MEPC = maximum expected pollutant concentration; MAPC = maximum acceptable pollutant concentration; RP = reasonable potential analysis results; ADBAC = antidegradation based average concentration, 2-year rolling average; ID = insufficient data to do reasonable potential analysis; a/ Based on professional judgement; b/ Non-Impact Limit, NIL, 30-day average.
c/ There will not be an effleunt limitation on mercury, but monitoring at low level will be required.

Since all of the whole effluent toxicity (WET) monitoring for acute toxicity during the past five years showed no acute toxicity, it is concluded that there is not a reasonable potential for the discharge to be acutely toxic. The renewal permit will not have any effluent limitations on WET, but will require continued monitoring for Acute WET.

Effluent Limitations The effluent limitations are given in Part 1.3.1 of the permit. Those limitations that are the same for the life of the permit are given in Table 12 below. There are three sets of effluent limitations for ammonia nitrogen and copper. The first set is effective when the permit become effective, the second set is effective January 1, 2013, and the third set is effective two years after the effective date of the permit. Those limitations are given in Table 13.

The WQBELs for metals and cyanide, the applicable ADBAC or NIL limitation effective in two years, and the decision on reasonable potential analyses are given in Table 11 below. As mentioned in the previous discussion, the permit will not have any effluent limitations or monitoring requirements for arsenic, trivalent chromium, iron, lead, manganese, and nickel. The permit will have no effluent limitations for cadmium, hexavalent chromium, weak acid dissociable cyanide, mercury, silver, and zinc, but will have monitoring requirements for these pollutants The permit will have effluent limitations and monitoring requirements for copper and selenium.

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Cu, Dis	63	25	Yes	63	39	Yes	63	16 b/	Yes
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Fe, TR	130	1,000	No	130	N/A	No	N/A	N/A	N/A
Pb. Dis	1.5	8.1	No	1.5	214	No	1.5	6.0 b/	No
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TABLE 12 - EFFLUENT LIMITATIONS EFFECTIVE IMMEDIATELY

Effluent Characteristic	Effluent Limitations			Basis d/
	30-Day Average a/	7-Day Average a/	Daily Maximum a/	
Flow, mgd	4.0	N/A	N/A	
BOD_5, mg/L (Kg/day) b/	30 (454)	45 (681)	NA	CER
Total Suspended Solids, mg/L (Kg/day) b/	30 (454)	45 (681)	NA	CER
E-Coli, No./100 mL	126	252	NA	WQS
Dissolved Oxygen, mg/L, Minimum c/	N/A	N/A	5.0 c/	WQS
Ammonia, Total (as N), mg/L	See Table 13	See Table 13	See Table 13	
Copper, Potentially Dissolved, ug/L	See Table 13	See Table 13	See Table 13	
Selenium, Potentially Dissolved, ug/L	8.0	N/A	19	WQS
The concentration of oil and grease in any single sample shall not exceed 10 mg/L nor shall there be any visible sheen in the receiving water or adjoining shoreline.				CER, WQS
There shall be no acute toxicity in the final effluent discharged from Outfall 001.				WQS CWA
The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.				WQS

a/ See Definitions, Part 1.1, for definition of terms.

b/ Percentage Removal Requirements (TSS and BOD_5 Limitation): In addition to the concentration limits for total suspended solids and BOD_5 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).

c/ The concentration of dissolved oxygen shall not be less than 5.0 mg/L in any grab sample or instantaneous measurement.

d/ Basis for effluent Limitations: CER = Colorado Department of Public Health and Environment, Water Quality Control Commission's Regulations for Effluent Limitations (Colorado Regulation No. 62); CWA = Clean Water Act; WQS = Water Quality Standards; I-WQS = Interim Water Quality Standards.

TABLE 13 – Effluent Limitations on Ammonia Nitrogen and Copper

	Interim Limitations Until 12/31/2012		WQBELs Effective 01/01/2013		Effective 2 Years after Effective Date of Permit	
Month	30-Day Average	Daily Maximum	30-Day Average	Daily Maximum	30-Day Average	Daily Maximum
Ammonia, Total (as N), mg/L						
Month						
January	N/A	N/A	13	14	10	14
February	13.6	N/A	14	21	10	21
March	12.5	18	15	23	10	23
April	20	N/A	9.2	22	9.2	22
May	23	N/A	9.4	20	9.4	20
June	28	N/A	9.3	23	8	23
July	N/A	N/A	10	27	8	27
August	N/A	N/A	10	26	8	26
September	N/A	26	11	24	8	24
October	N/A	N/A	10	19	8	19
November	N/A	N/A	10	16	10	16
December	N/A	N/A	11	15	10	15
Copper, Potentially Dissolved, ug/L b/	N/A	N/A	25	39	16	39

a/ See Definitions, Part 1.1, for definition of terms.

b/ "Potentially Dissolved Metals" means that portion of a constituent measured from the filtrate of a water and suspended sediment sample that was first treated with nitric acid to a pH of less than 2.0 and let stand for 8 to 96 hours prior to sample filtration using a 0.4 or 0.45 um membrane filter. Note: The "Potentially Dissolved" method cannot be used where nitric acid will interfere with the analytical procedure used for the constituent measured.

Compliance Schedules

In accordance with the requirements of 40 CFR Part 122.47, **t**he permit will contain compliance schedules for meeting the effluent limitations on ammonia nitrogen and copper that are effective January 1, 2013, and the effluent limitations on ammonia nitrogen and copper that are effective two years after the effective date of the permit. Those compliance schedules are given in Part 1.3.4 of the permit. It should be noted that the WQCD regulations provide for the use of compliance schedules to meet WQS where appropriate. However, the compliance dates in the permit for meeting the limitations on ammonia nitrogen and copper are based on WQCD regulations. Therefore, compliance schedules authorized by the

state are not necessary. Compliance schedules are not necessary for those effluent limitations that are effective when the permit becomes effective (e.g., BOB_5, TSS, etc.) Based on the design capacity of the WWTF and the present loadings, it appears that the limitations on ammonia nitrogen can be met by making the appropriate operational changes in how the WWTF is operated. The compliance schedule will require the permittee to evaluate the WWTF to determine the appropriate operational changes and implement them to meet the limitations by the deadlines.

Although the reasonable potential analysis shows that there is a reasonable potential for the effluent limitations on copper to be exceeded, the monitoring data indicates that the effluent limitations can be met by maintaining adequate control over the quality of wastes being discharged to the WWTF. Only one monitoring result, 18.3 ug/L, was greater than the 30-day average limitation that is effective two years after the effective date of the permit. If an occasional monitoring value is greater than the 30-day average limitation, it may be possible to show compliance by collecting and analyzing another sample within the same 30 day period.

Self-Monitoring Requirements

Part 1.3.2.1 of the permit has the self-monitoring requirements for the various pollutants and the WET monitoring requirements are given in Part 1.3.2.2. In addition to the pollutants that have effluent limitations, Part 1.3.2.1 also has monitoring requirements for cadmium, hexavalent chromium, mercury, silver, zinc, weak acid dissociable cyanide, and nonylphenol. The frequency of monitoring was determined mainly on the WQCD's "Baseline Monitoring Frequency, Sample Type, and Reduced Monitoring Frequency Policy for Industrial and Domestic Wastewater Treatment Facilities", May 1, 2007. The expected flow of about 1MGD was used in selecting the frequency. The quarterly frequency for mercury is the same as being used by the WQCD for the permit for the Fountain Sanitation District, which also does not have an effluent limitation on mercury.

Practical quantitation limits were specified for the metals and the cyanide and are the same as used in the WQCD's permits for the Security Sanitation District WWTF, the Widefield Water & Sanitation District WWTF, and the Fountain Sanitation District WWTF. For purposes of this permit, analytical values less than the PQL shall be considered to be zero for purposes of determining averages. If all analytical results are less than the PQL, then "less than x", where x is the PQL, shall be reported on the Discharge Monitoring Report form. Otherwise, report the maximum observed value and the calculated average(s).

There are no analytical methods for weak acid dissociable cyanide and nonylphenol listed under 40 CFR Part 136. The permittee is free to chose the analytical method for weak acid dissociable cyanide provided it can meet the PQL of 5 ug/L or less. The permits for WQCD's permits for Security, Widefield, and Fountain give the permittee the choice of using either ASTM Method D7065 or D7485 for the analysis of nonylphenol. The WQCD considers the default PQLs for these methods to be 10 ug/L for D7065 and 0.33 ug/L for D7485. The permittee shall use the appropriate default PQL or develop their own site-specific PQL in accordance with the WQCD's Practical Quantitation Limitation Guidance Document (July 2008) for Organic Parameters.

Part 1.3.2.2 requires the permittee to perform semi-annual monitoring for acute whole effluent toxicity. The previous permit gave the permittee the option to alternate test species each semi-annual period (i.e., conduct an acute 48-hour static toxicity test using *Ceriodaphnia dubia* one

semi-annual period and conduct an acute 96-hour static toxicity test using *Pimephales promelas* the other semi-annual period). This was done because no toxicity had been detected in the previous 5 years (2000 – 2004) with quarterly WET testing with alternating species. Because acute toxicity has not been detected for over 10 years, the WET testing will remain semi-annually with alternating test species. However, to ensure that seasonal changes in the effluent quality, especially variations in ammonia levels, are adequately evaluated through toxicity testing, semi-annual monitoring shall be on a alternating 6-month and 7-month basis (i.e., January and July, February and August, etc.) and the test species shall also be alternated between the winter and summer monitoring periods. Starting in January 2012, the following schedule for acute WET testing shall be followed to the extent practical:

Year	Month	Species
2012	January	*Ceriodaphnia dubia*
	July	*Pimephales promelas*
2013	February	*Pimephales promelas*
	August	*Ceriodaphnia dubia*
2014	March	*Ceriodaphnia dubia*
	September	*Pimephales promelas*
2015	April	*Pimephales promelas*
	October	*Ceriodaphnia dubia*
2016	May	*Ceriodaphnia dubia*
	November	*Pimephales promelas*

Reporting of Monitoring Results

The reporting of the analytical results will be monthly instead of quarterly as in the previous permit. The effluent limitations on ammonia often change from month to month, so it is necessary to get the analytical results for each month separately so as to determine compliance with the effluent limitations.

Stormwater

Stormwater discharges from treatment works treating domestic sewage and that have a design flow of 1.0 mgd or greater are required to have coverage under an NPDES permit. The stormwater discharges from the Fort Carson WWTF are covered under NPDES general permit number COR05A11F. Requirements for the stormwater discharges will not be included in permit number CO-0021181.

Endangered Species Act (ESA) Requirements

Section 7(a) of the Endangered Species Act requires federal agencies to insure that any actions authorized, funded, or carried out by an Agency are not likely to jeopardize the continued existence of any federally-listed endangered or threatened species or adversely modify or destroy critical habitat of such species. Federally listed threatened, endangered and candidate species found in El Paso County, Colorado include:

Species	**Status**
Arkansas darter (*Etheostoma cragini*)	C
Greenback cutthroat trout (*Oncorhynchus clarki stomias*)	T
Gunnison's prairie dog (*Cynomys gunnisoni*)	C
Least tern (interior population) (*Sternula antillarum*)	E
Mexican spotted owl (*Strix occidentalis lucida*)	T
Mountain Plover (Charadrius montanus)	P
Pallid sturgeon (*Scaphirhynchus albus*)	E
Piping pliver (*Charadrius melodus*)	T
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)	T
Ute ladies'-tresses orchard (*Spiranthes diluvialis*)	T
Western prairie fringed orchid (*Platanthera praeclara*)	T
Whooping crane (*Grus americana*)	E

C = Candidate, E = Endangered, P = Proposed, T = Threatened

The EPA finds that this permit is Not Likely to Adversely Affect any of the species listed by the US Fish and Wildlife Service under the Endangered Species Act. This facility discharges into Clover Ditch, which flows into Fountain Creek, which flows into the Arkansas River at Pueblo. The permit limitations are protective of water quality and flow conditions are expected to be similar to those during the previous permit.

National Historic Preservation Act (NHPA) 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 EPA has evaluated its planned reissuance of the NPDES permit for the Fort Carson WWTF to assess this action's potential effects on any listed or eligible historic properties or cultural resources. The EPA does not anticipate any impacts on listed/eligible historic properties or cultural resources because this permit is a renewal and will not be associated with any new ground disturbance or significant changes to the volume or point of discharge.

Miscellaneous

The permit will be issued for a period of approximately 5 years, but not to exceed 5 years, with the permit effective date and expiration date determined at the time of permit issuance.

Permit drafted by Robert D Shankland, SEE, 8P-W-WW, EPA Region 8, June 27, 2011

Preliminary draft reviewed by Bruce Kent, 8P-W-WW, EPA Region 8

Preliminary draft WET language reviewed by Gail Franklin, 8P-W-WW, EPA Region 8

Addendum

The draft permit was public noticed on July 22, 2011. The Colorado Division of Parks and Wildlife commented that "Based on the location and type of action being proposed the Division believes impacts to the wildlife resources will be negligible, as long as there is continued compliance with the Clean Water Act." The Colorado State Historic Preservation Officer had a similar comment, "Based on the nature of the proposed project, it is our opinion that no historic properties will be affected and the project may proceed without additional cultural resources inventory."

As of this date, the State of Colorado has not issued, denied, or waived certification pursuant to Section 401(a)(1) of the Clean Water Act. Since it has been more than 60 days since the draft permit was public noticed and certification requested, The EPA considers the State of Colorado to have waived certification of the permit. This is in accordance with the provisions of 40 CFR Part 124.53.

The permit will be issued with no changes from how it was public noticed. The effective date will be December 1, 2011, and the expiration date will be September 30, 2016.

Robert D Shankland, SEE, 8P-W-WW, EPA Region 8, October 24, 2011.

ATTACHMENT A

FORT CARSON WWTP FLOW SCHEMATIC