

Fact Sheet

Permittee Name: U.S. Bureau of Reclamation (BOR)
Permit No.: CO-0021717
Mailing Address: 11056 W. County Road 18E
Loveland, Colorado 80537-9711

FACILITY INFORMATION

Name of Facility: U.S. Bureau of Reclamation Leadville Mine Drainage Tunnel
Treatment Plant (LMDT)
Responsible Official: Signe Snortland, ECAO Area Manager
Contact Person: Operations and Maintenance Chief
Telephone: (970) 962-4338

Facility Location

The BOR LMDT Treatment Plant (LMDT or treatment plant) is located in Lake County, Colorado, approximately one mile north of Leadville, Colorado (see Figure 1 below).

Figure 1. LMDT Map

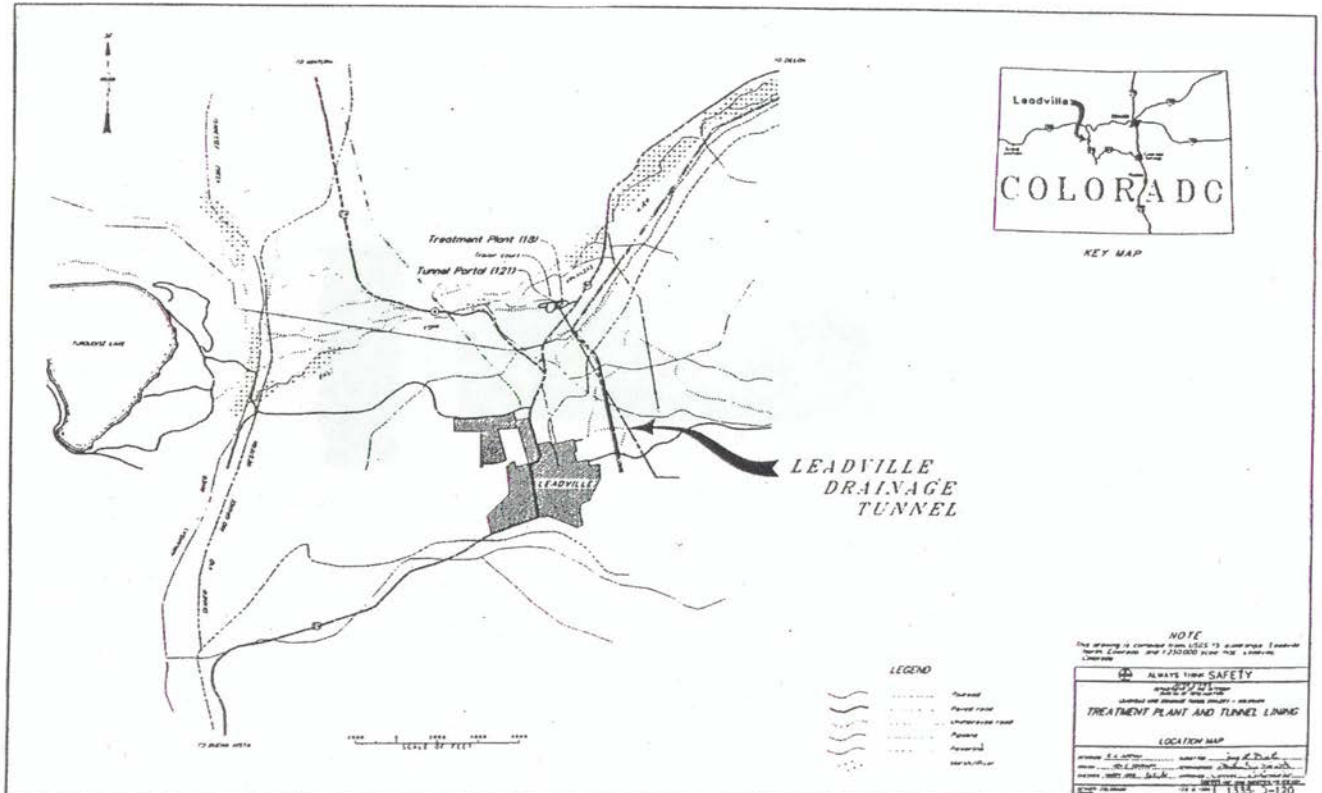


FIGURE 1. Leadville Mine Drainage Tunnel Location Map

Facility and Regulatory History

The U.S. Bureau of Mines (USBM) began construction of the LMDT during World War II under the direction of the War Production Board. The tunnel was constructed to drain accumulated mine water seepage from underground workings in the Leadville area, thus allowing further exploitation of the mineral reserves. Due to the exhaustion of appropriated funds, the tunnel construction ceased in 1945.

Metal demands resulting from the Korean conflict provided the impetus for a second project to extend the tunnel. The tunnel was completed in 1952 at a total length of 11,299 feet.

In 1959, the BOR secured title to the LMDT from the USBM. BOR intended to use the tunnel drainage as part of the water supply for the Frying Pan-Arkansas Water Project. Water rights conflicts precluded the use of the tunnel drainage for that purpose.

The portal and first 635 feet of the tunnel was excavated through glacial deposits and terrace gravel. The unconsolidated nature of these materials contributed to structural collapses in the first several hundred feet of the tunnel. BOR reconditioned and placed a bulkhead in this portion of the tunnel in 1980. The tunnel effluent contains high concentrations of metals, such as zinc, iron and cadmium was contributed to the Arkansas River.

The high metals concentrations within the streams greatly diminished aquatic life populations. However, upon the construction of both the treatment plant and the Yak Tunnel Treatment Plant, water quality in the stream segments has greatly improved, supporting a viable environment for aquatic life once again.

Environmental Protection Agency (EPA) issued National Pollutant Discharge Elimination System (NPDES) Permit Number CO-0021717 to the BOR authorizing discharge of tunnel effluent to the East Fork of the Arkansas River in 1975 and 1979.

In 1980, EPA and BOR signed an Administrative Stipulation and Agreement which contained a schedule for plugging the tunnel. The BOR completed only two of the scheduled activities. EPA re-issued NPDES Permit Number CO-0021717 in September 1981 which retained effluent limitations listed in the 1975 issued permit.

In September 1984, BOR and EPA signed another Stipulation and Agreement for bringing the Tunnel effluent into compliance. The Agreement included a schedule for identifying a preferred compliance alternative.

BOR requested the renewal of Permit Number CO-0021717 in June 1986. EPA administratively extended the permit until a renewal permit was issued.

In 1987, the BOR, with the concurrence of EPA, tentatively selected a mine water treatment plant as the alternative to bring the tunnel effluent into compliance with the Clean Water Act (CWA).

In 1989, a Federal Facility Compliance Agreement was signed that required BOR to design, construct and operate a mine water treatment system to meet set effluent limitations. The targeted effluent limitations were based upon the State of Colorado's effective stream use classification for cold water aquatic life, the State of Colorado's proposed stream criteria, EPA's Effluent Guidelines for Ore Mining and Dressing Point Source Category (40 CFR 440), the National Ambient Water Quality Criteria ("The Gold Book"), and a loading analysis performed on the East Fork of the Arkansas River. The effluent limitations included the following parameters: pH, total zinc, total copper, total lead, total cadmium, total silver, total iron, total manganese and total suspended solids.

In accordance with the 1989 Federal Facility Compliance Agreement, the treatment plant attained operational status by the June 1, 1992 deadline. A revised NPDES Permit Number CO-0021717 was reissued and became effective May 1, 1992. Since the re-issuance of the permit in 1992, the treatment plant has had a good compliance record with only isolated violations, the majority occurring in the early stages of plant operation. A revised NPDES permit was reissued in 2000 and again in 2008. Since the re-issuance of the permit in 2008, the treatment plant has had only 3 effluent exceedances. The exceedances were for flow in the months of September, October and November 2008.

Facility Description

Raw un-treated water from the tunnel is directed to the treatment plant via gravity flow and two dewatering locations along the tunnel alignment via buried pipelines. First, raw water pH is adjusted with sulfuric acid for carbon dioxide stripping. The pH adjusted water is then treated in two parallel process trains that are designed for an average flow of 2.5 MGD and peak flow of 3.2 MGD. The pH is then adjusted with sodium hydroxide to 9.8 or higher to cause precipitation of metal hydroxides. Polymer and recycled sludge from the thickener are added in the reactor tanks to enhance metals removal. The settling of metal hydroxide sludge takes place in the solids contact clarifiers (SCCs), from which excess sludge is removed and stored in holding tanks, and clean water overflows to gravity sand filtration for final polishing. Finally, the pH is adjusted with sulfuric acid (between 6.5-9.0 s.u.) and the treated water is discharged through outfall 001 to an unnamed drainage way tributary to the East Fork of the Arkansas River.

Excess sludge (4-8% solids) is pumped from the SCCs unites to holding tanks. Sludge is stabilized with trisodium trimercapto-s-triazine, trade name TMT-55. TMT-55 forms strong bonds with metals, specifically reducing the mobility of cadmium which has weak bond formation with the hydroxide and yielding metal hydroxide sludge. (Note: TMT-55 also stabilizes all metals and in theory can meet a thousand year toxicity characteristic leaching procedure (TCLP)). Decant from dewatering is returned to the headworks of the treatment system for further treatment. Dewatered sludge is stored on site in roll-off boxes prior to disposal. If the sludge passes a TCLP test, it is disposed of in a Resource Conservation Recovery Act (RCRA) Subtitle D landfill in Colorado. When a TCLP failure renders the sludge a hazardous waste, the sludge is sent to a permitted RCRA Treatment Storage and Disposal (TSD) facility in Colorado

or Utah.

Description of Discharge

Outfall 001 is the outfall from the treatment plant prior to contact or admixture with any surface water flows. It is located across the road from the treatment plant. Outfall 001 is located at 31°16'26" latitude and 106°17'17" longitude.

Changes since Previous Permit

In early 2008, EPA commenced a response action in Operable Unit 12 of the Leadville Superfund site to install a new dewatering well into the Leadville Tunnel at 4,696 feet up tunnel from the portal. This well and pump were installed and tested by EPA for the purpose of dewatering the groundwater portion, known as the "mine pool," or Operable Unit 12 (OU12) of the site. A pipeline was constructed from the "mine pool" well pump and tied into the headworks of the treatment plant. The BOR has treated this water continuously since June 2008, in addition to the water received from the original influent sources of gravity flow and the pump station at 1,025 feet up tunnel from the portal. In the first several years after commissioning this new well, the treatment plant operated near maximum capacity at 2.45 MGD, eventually pumping and treatment over 6 billion gallons of mine pool water. In the past few years, mine pool inflows have diminished, so that operations currently average between 1.5 and 2.0 MGD, with seasonal fluctuations.

The BOR also continues to seasonally treat highly contaminated, very poor quality surface water from Superfund Operable Unit 6 Stray Horse Gulch retention ponds, via a connection to the Leadville Tunnel at Marion Shaft, established by EPA in 2001. By controlling flows and closely monitoring spring runoff, the treatment plant has managed the significant increase in metal loadings created when the Stray Horse Gulch retention ponds overflow. The 2010 Record of Decision for OU6 established that the BOR will treat this water until construction of a final remedy is complete.

The emergency detention pond at the treatment plant was removed and replaced in 2012. The detention pond is used in emergency bypass conditions when the treatment plant is offline. The new pond has a double liner, with leak detection and a protective layer of rock. Monitoring wells and dewatering wells have been installed around the parameter of the new detention pond. Regional groundwater within the vicinity of the detention pond is dewatered via the dewatering wells and routed to the treatment plant for treatment.

Receiving Water

The immediate receiving water for the discharge from the treatment plant is an unnamed drainage way tributary to the East Fork of the Arkansas River (Segment 5 of the Upper Arkansas River Basin). Segment 5 includes all tributaries to the Arkansas River, including wetlands, from the source to immediately below the confluence with Brown's Creek. Segment 2a is directly

downstream of Segment 5. Segment 2a includes the mainstem of the East Fork of the Arkansas River and the Arkansas River from a point immediately above the confluence with Birdseye Gulch to a point immediately above the confluence with California Gulch. Segment 2b is directly downstream of Segment 2a and includes the mainstem of the Arkansas River from a point immediately above California Gulch to a point immediately above the confluence with Lake Fork.

Segment 5 is on the State of Colorado's 2012 303(d) list for aquatic life; however, the portion of the segment that is impaired is Lake Fork below Sugarloaf Dam to the confluence with the Arkansas River and is not the portion of the Segment that this permit authorizes discharge.

Neither Segment 2a or Segment 2b are on the State of Colorado's 2012 303(d) list of impaired stream segments for non-attainment (See Colorado Regulation #93). However, in the past, Segment 2b was listed on the State's 303(d) list for cadmium and zinc and a TMDL was developed and approved by EPA. Since the treatment plant's immediate receiving water is Segment 5 and not 2b, the approved TMDL did not set a waste load allocation (WLA) for the treatment plant discharge.

The applicable designated use classifications and standards for Segment 5, Segments 2a and Segment 2b are given in Table 1 below:

Table 1: Upper Arkansas River Basin Use Classification and Water Quality Standards

Use Classifications:

Segment 5*

- Aquatic Life, Class 1 (Cold)
- Recreation, Class E
- Water Supply
- Agriculture

Standards:

- D.O. = 6.0 mg/L, 7.0 mg/L (sp)
- pH = 6.5 - 9.0
- E. Coli = 126/100 ml
- NH₃ (acute/chronic) = TVS/TVS
- Residual Cl₂ (acute) = 0.019 mg/L
- Residual Cl₂ (chronic) = 0.011 mg/L
- Free CN = 0.005 mg/L
- S as H₂S = 0.002 (undissociated)
- Boron = 0.75 mg/L
- Nitrite = 0.05 mg/L as N
- Nitrate = 10 mg/L as N
- Chloride = 250 mg/L
- Sulfate = WS

Arsenic (acute) = 340 µg/L
 Arsenic (chronic) = 0.02 µg/L (Trec.). Temporary Modification As (ch)=hybrid, expiration date of 12/31/21
 Cadmium (acute) = TVS (trout)
 Cadmium (chronic) = TVS
 Chromium (III) (acute) = 50 µg/L (Trec.)
 Chromium (III) (chronic) = TVS
 Chromium (VI) (acute/chronic) = TVS/TVS
 Copper (acute/chronic) = TVS/TVS
 Iron (chronic) = 1000 µg/L (Trec.)
 Iron (chronic) = WS (dis)
 Lead (acute/chronic) = TVS/TVS
 Manganese (acute/chronic) = TVS/TVS
 Manganese (chronic) = WS (dis)
 Mercury (chronic) = 0.01 µg/L (tot)
 Nickel (acute/chronic) = TVS/TVS
 Selenium (acute/chronic) = TVS/TVS
 Silver (acute/chronic) = TVS/TVS (trout)
 Zinc (acute) = TVS
 Zinc (chronic) = TVS

Segment 2a*

Aquatic Life, Class 1 (Cold)
 Recreation, Class E
 Water Supply
 Agriculture

Segment 2b*

Aquatic Life, Class 1 (Cold)
 Recreation, Class E
 Agriculture

Standards:

Segment 2a*

D.O. = 6.0 mg/L, 7.0 mg/L (sp)
 pH = 6.5 - 9.0
 E. Coli = 126/100 ml
 Chlorophyll a = 150 mg/m²
 NH₃ (acute/chronic) = TVS/TVS
 Residual Cl₂ (acute) = 0.019 mg/L
 Residual Cl₂ (chronic) = 0.011 mg/L
 Free CN = 0.005 mg/L
 S as H₂S = 0.002 (undissociated)
 Boron = 0.75 mg/L
 Nitrite = 0.05 mg/L as N
 Nitrate = 10 mg/L as N
 Chloride = 250 mg/L
 Sulfate = WS

Segment 2b*

Same as 2a
 Same as 2a
 Same as 2a
 N/A
 Same as 2a
 Same as 2a
 Same as 2a
 Same as 2a
 Same as 2a
 Same as 2a
 N/A
 N/A
 N/A

P=110 µg/L (tot)	N/A
Arsenic (acute) = 340 µg/L	Same as 2a
Arsenic (chronic) = 0.02 µg/L (Trec.)	= 7.6 µg/L (Trec.)
Cadmium (acute) = TVS (trout)	=1.136672- (ln(hardness)*0.041838*e ^{(0.9151*ln(hardness)-3.6236)})
Cadmium (chronic) = TVS	=(1.101672- [ln(hardness)*0.041838])*e ^(0.7998[ln hardness]-3.1725)
Chromium (III) (acute) = 50 µg/L (Trec.)	N/A
Chromium (III) (acute/chronic) = N/A	=TVS/TVS
Chromium (III) (chronic) = TVS	= 100 µg/L (Trec.)
Chromium (VI) (acute/chronic) = TVS/TVS	Same as 2a
Copper (acute/chronic) = TVS/TVS	Same as 2a
Iron (chronic) = 1000 µg/L (Trec.)	= 1000 µg/L (Trec.)
Iron (chronic) = WS (dis)	N/A
Lead (acute/chronic) = TVS/TVS	Same as 2a
Manganese (acute/chronic) = TVS/TVS	Same as 2a
Manganese (chronic) = WS (dis)	N/A
Mercury (chronic) = 0.01 µg/L (tot)	Same as 2a
Molybdenum (chronic) = 160 (Trec)	Same as 2a
Nickel (acute/chronic) = TVS/TVS	Same as 2a
Selenium (acute/chronic) = TVS/TVS	Same as 2a
Silver (acute/chronic) = TVS/TVS (trout)	Same as 2a
Zinc (acute) =TVS	=0.978*e ^{(0.8537[ln(hardness)]+2.2178)}
Zinc (chronic) = TVS	= 0.986*e ^{(0.8537[ln(hardness)]+2.0469)}

TVS - Table Value Standard; numerical criteria set forth in Table III from the State of Colorado's Basic Standards and Methodologies for Surface Water, Colorado Water Quality Control Commission Regulation No.31.

*From "Colorado Water Quality Control Commission Regulation No. 32. Classifications and Numeric Standards for Arkansas River Basin" as amended January 12, 2015.

Fe (ch) = WS (dis), Mn (ch) = WS (dis), and SO₄ = WS abbreviations mean: For all surface waters with an actual water supply use, the less restrictive of the following options shall apply as numerical standards, as specified in the Basic Standards and methodologies at Colorado Regulation 31.11(6) (from 32.6 Tables (2) of Classifications and Numeric Standards for Arkansas River Basin, Regulation No. 32):

- (i) existing quality as of January 1, 2000; or
- (ii) Iron = 300 µg/L (dissolved)
Manganese = 50 µg/L (dissolved)
SO₄ = 250 mg/L

Dissolved metals standards are required to be analyzed based on the “potentially dissolved” method, See Colorado Regulation 31.14(7). (Colorado Basic Standards and Methodologies, Regulation No. 31).

Reasonable Potential

The NPDES regulations in 40 CFR 122.44(d)(1)(i - iii) require permit writers to assess effluent to evaluate impact of direct dischargers on downstream water quality. This assessment is used to determine permit limitations that are protective of water quality uses. The data submitted in the permit application were evaluated for reasonable potential to exceed the water quality standards.

All water quality based effluent limits (WQBELs) from the previous permit were carried over to this renewal permit based upon antibacksliding provisions of 40 CFR 122.44(l). Therefore, the pollutants are considered as having qualitative RP and do not require a quantitative RP analysis. This includes the following pollutants:

- Aluminum
- Cadmium
- Copper
- Iron
- Lead
- Manganese
- Mercury
- Silver
- Selenium
- Zinc

Based upon the 2C permit application documentation, the facility believed to be present the following additional pollutants for which there were no previous permit WQBEL or monitoring requirement: sulfate (as SO₄) and magnesium.

Per Colorado Water Quality Control Commission Regulation No. 32. Classifications and Numeric Standards for Arkansas River Basin, all surface waters with a “water supply” classification that are not in actual use as a water supply, no water supply standards are applied for sulfate unless the Commission determines as the result of a site-specific rulemaking hearing that such standards are appropriate. For this permit, the receiving water (un-named tributary of the Upper Arkansas River Basin, Segment 5) does not have an actual use as a water supply and therefore, no sulfate standard would apply and no RP analysis could be performed. Additionally, the State of Colorado has not promulgated a magnesium standard for Segment 5, 2a or 2b of the Upper Arkansas River and therefore, no magnesium standard would apply and no RP analysis could be performed.

Effluent Limitations and Monitoring Requirements

Effluent limitations and monitoring requirements are presented below in Table 2. Corresponding effluent monitoring requirements are presented in Table 3. Table 4 presents special upstream and downstream monitoring requirements. The effluent limitations and monitoring requirements have been derived from the State of Colorado's Water Quality Control Commission Regulation No. 31 (Reg.31), *The Basic Standards and Methodologies for Surface Water*, State of Colorado's Water Quality Control Commission Regulation No. 32 (Reg.32), *Classifications and Numeric Standards for Arkansas River Basin*, State of Colorado's Water Quality Control Commission Regulation No. 62, *Regulations for Effluent Limitations* (Reg.62), and previous permit limits.

Table 2. Permit Effluent Limitations

Effluent Characteristics	Discharge Limitations				Limit Basis
	30-day Average <u>a</u> /	Maximum Weekly Average <u>h</u> /	Daily Maximum <u>a</u> /	2-year Average <u>f</u> /	
Flow, MGD	2.5	N/A	3.2	N/A	Facility Design
Total Suspended Solids, mg/L	30	N/A	45	N/A	Prev. Permit
Oil and Grease, mg/L	Report	N/A	10	N/A	CO Reg. 62
pH, s.u. <u>b</u> /	Report	N/A	6.5 - 9.0	N/A	CO Reg. 32
Temperature, °C <u>f</u> /	N/A	17	21.7	N/A	CO Reg. 32
Temperature, °C <u>g</u> /	N/A	9	13	N/A	CO Reg. 32
Aluminum, PD, µg/L <u>d</u> /	87	N/A	750	N/A	Prev. Permit
Cadmium, PD, µg/L <u>d</u> /	0.9	N/A	1.2	N/A	CO Reg.31, 32
Copper, PD, µg/L <u>d</u> /, <u>e</u> /	14	N/A	23	11	CO Reg.31, 32
Iron, TREC, µg/L <u>d</u> /	1000	N/A	Report	N/A	CO Reg.32
Lead, PD, µg/L <u>d</u> /	1.5	N/A	32	N/A	CO Reg.31, 32

Manganese, TREC, µg/L	1000	N/A	4694	N/A	CO Reg. 31, 32
Mercury, TOT, µg/L <u>i/</u>	0.01	N/A	Report	N/A	CO Reg. 32
Silver, PD, µg/L <u>c/</u> , <u>d/</u>	0.035	N/A	0.83	N/A	CO Reg.31, 32
Selenium, TREC, µg/L <u>d/</u>	4.6	N/A	18.4	N/A	CO Reg.31, 32
Zinc, PD, µg/L <u>d/</u>	84	N/A	284	N/A	CO Reg.31, 32
There shall be no discharge of floating solids or visible foam in other than trace amounts.					

TREC- Total Recoverable Metals

TOT- Total Metals

PD- Potentially Dissolved Metals

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

b/ Daily minimum - daily maximum limitation.

c/ Based on current approved analytical methods, the PQL for silver is 0.2 µg/L. Analytical values less than 0.2 µg/L should be reported and shall be considered in compliance with the limits.

d/ For averaging calculations of analytical results, measurements less than the PQL shall be considered as zero.

e/ Antidegradation limits apply as the average of all 30-day average data collected for months during a rolling 24-month period.

f/ Applies June through September.

g/ Applies October through May.

h/ Maximum Weekly Average – maximum weekly average limitation for temperature.

i/ Low Level Mercury.

CO Reg.31 Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 31, *The Basic Standards and Methodologies for Surface Water*, effective January 31, 2013.
(www.cdphe.state.co.us/op/regs/waterqualityregs.asp)

CO Reg.32 Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 32, *Classifications and Numeric Standards for Arkansas River Basin*, effective June 30, 2015.
(www.cdphe.state.co.us/op/regs/waterqualityregs.asp)

CO Reg.62 Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 62, *Regulations for Effluent Limitations*, effective July 30, 2012. (www.cdphe.state.co.us/op/regs/waterqualityregs.asp)

Prev. Permit Permit limitations maintained from previous NPDES permit (effective September 1, 2008, on file at EPA Region 8).

CO. Implementation Policy Practical Quantitation Limits (PQL) effective February 3, 2015.
 (https://www.colorado.gov/pacific/sites/default/files/Policy%20CW-6%20%20PQL%20rev.pdf)

Table 3. Permit Effluent Monitoring Requirements

Effluent Characteristics	Monitoring Requirements		
	Monitoring Frequency	Sample Type <u>a/</u>	PQL <u>e/</u>
Flow, MGD	daily	continuous	N/A
Hardness (as CaCO ₃), mg/L	monthly	grab	N/A
Total Suspended Solids, mg/L <u>c/</u>	daily	composite	N/A
Oil and Grease, mg/L <u>b/</u>	daily	visual/grab	N/A
pH, s.u. <u>c/</u>	daily	continuous	N/A
Temperature °C	monthly	grab	N/A
Aluminum, PD, µg/L	monthly	composite	15
Antimony, TOT, µg/L <u>d/</u>	Twice/5 years	composite	2
Arsenic, TREC, µg/L	monthly	composite	1
Barium, TOT, µg/L <u>d/</u>	Twice/5 years	composite	1
Beryllium, TOT, µg/L <u>d/</u>	Twice/5 years	composite	2
Cadmium, PD, µg/L	weekly	composite	0.5
Chromium, TOT, µg/L <u>d/</u>	Twice/5 years	composite	20
Cobalt, TOT, µg/L <u>d/</u>	Twice/5 years	composite	N/A
Copper, PD, µg/L	monthly	composite	2
Cyanide, TOT, µg/L <u>d/</u>	Twice/5 years	composite	10
Iron, TREC, µg/L	monthly	composite	20
Lead, PD, µg/L	weekly	composite	0.5
Manganese, TREC, µg/L	monthly	composite	2
Mercury, TOT, µg/L	weekly	composite	0.002

Molybdenum, TOT, µg/L <u>d/</u>	Twice/5 years	composite	0.5
Nickel, TOT, µg/L	Twice/5 years	composite	1
Nitrogen, TOT, mg/L	Semi-annual	composite	0.5
Phenols, TOT, µg/L <u>d/</u>	Twice/5 years	composite	30
Phosphorus, TOT, mg/L	Semi-annual	composite	0.05
Silver, PD, µg/L	weekly	composite	0.2
Selenium, TREC, µg/L	monthly	composite	0.5
Thallium, TOT, µg/L <u>d/</u>	Twice/5 years	composite	0.5
Tin, TOT, µg/L <u>d/</u>	Twice/5 years	composite	N/A
Titanium, TOT, µg/L <u>d/</u>	Twice/5 years	composite	N/A
Zinc, PD, µg/L	weekly	composite	10

TREC- Total Recoverable Metals

TOT- Total Metals

PD- Potentially Dissolved Metals

- a/ See Definitions, Part 1.1. for definition of terms.
- b/ A grab sample shall also be taken if a visual sheen is observed.
- c/ Samples shall be collected daily when personnel are scheduled to be on site.
- d/ Samples shall be collected at least twice in five years and must be collected during April through June.
- e/ Practical Quantitation Limit (PQL) means the minimum concentration of an analyte (substance) that can be measured with a high degree of confidence that the analyte is present at or above that concentration. The method and procedures used to analyze for an effluent characteristic (e.g., cadmium) shall have a PQL no greater than specified in this table (e.g., PQL for cadmium no greater than 0.5 ug/L). **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).**

Table 4. Upstream & Downstream Permit Monitoring Requirements

Water Quality Parameter (at stations EF-1 and EF-2)	Monitoring Requirements	
	Monitoring Frequency	Sample Type <u>a/</u>
Flow, cfs	monthly	instantaneous
Hardness (as CaCO ₃), mg/L	monthly	grab

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

Changes in Permit Conditions

Outfall 002, which is the discharge point from the detention pond overflow line, was removed from this renewal permit. Throughout the past 15 or more years there has been no discharge from Outfall 002. The outfall is located at 31°16'28" latitude and 106°17'19" longitude and is located adjacent to Outfall 001. Both Outfall 001 and 002 discharge to same receiving water (un-named tributary of the Upper Arkansas River Basin, Segment 5). Outfall 002 is an emergency discharge location, only to be used during bypass or upset conditions and in the previous permit was permitted as such. However, NPDES permits cannot authorize the discharge of a bypass or upset. However, in the event of a bypass or upset there are conditions in the permit the permittee must follow depending on the nature of the bypass or upset (unanticipated, anticipated, etc.). For more information on the requirements for Bypass of Treatment Facilities and Upset Conditions, see Sections 3.7 and 3.8 of the permit, respectively.

Unlike the previous permit, the final effluent limitations in this permit were not applied on seasonal basis. However, as described below in detail, a seasonal loading analysis was conducted to ensure all applicable water quality standards were protected. Since derivation of the previous effluent limitations, additional data has become available for analysis, stream water quality has changed due to the activation of the treatment facilities and other on-going Superfund activities, improved treatment technologies have been employed at the treatment plant, and the governing Colorado Water Quality Standards have been amended. With new and advanced treatment technologies, the treatment plant has consistently reported metals concentrations well below the previous permit limits during all times of the year. Therefore, EPA determined it is no longer necessary to allow for seasonal limits to accommodate the flow and hardness variations in the Upper Arkansas River Basin between seasons. Therefore, the final effluent limits apply year-round (i.e. there will be no high or low seasonal flow based limits).

Monthly hardness (as CaCO₃) monitoring will be required at Outfall 001 to assist in future development of WQBELs for Segment 5 of the Upper Arkansas River Basin.

Additional monitoring will be required due to the new wastewater source of highly contaminated,

very poor quality surface water from Superfund Operable Unit 6 Stray Horse Gulch retention ponds. The treatment plant effluent must be monitored twice during the five year permit cycle and must be monitored during high flow condition (April – June) since this when the facility closely monitors the treatment plant conditions and if optimal, slows releases the wastewater from the Superfund Operable Unit 6 Stray Horse Gulch retention ponds to the treatment plant. The pollutants to be monitored are the following:

- Antimony, Total
- Barium, Total
- Beryllium, Total
- Chromium, Total
- Cobalt, Total
- Cyanide, Total
- Molybdenum, Total
- Nickel, Total
- Phenols, Total
- Thallium, Total
- Tin, Total
- Titanium, Total

Results of the additional monitoring must be reported with the renewal NPDES permit application due no later than 180 days prior to expiration of this permit.

Per Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 32, *Classifications and Numeric Standards for Arkansas River Basin*, effective June 30, 2015, temperature water quality standards will be applied as required.

Per Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 85, *Nutrients Management Control Regulation*, effective September 30, 2012, non-domestic wastewater treatment works discharging prior to May 31, 2013 (which would include LMDT) will not be required to comply with the numeric nutrients limits in subsections 85.5(1)(a)(iii)(a) and (b) prior to May 31, 2022. This requirement applies to existing permitted facilities discharging to the Arkansas Headwaters except for dischargers that are discharging effluent concentrations of total nitrogen or total phosphorus that are greater than 53 mg/L and 6 mg/L, respectively. According to BOR, there is no current total nitrogen (TN) or total phosphorus (TP) data available to confirm that LMDT is discharging effluent concentrations of TN or TP less than 53 mg/L and 6 mg/L, respectively. Therefore, TN or TP monitoring will be required semi-annually.

Monthly arsenic monitoring will be required as discussed in *Discussion on Permit Effluent Limitations and Monitoring Requirements* below.

Discussion of Effluent Limitation Development

The development of effluent limitations for the treatment plant has been a complex and involved process. The water quality of the Upper Arkansas River has historically been negatively impacted by mining activities. Prior to construction of the treatment plant and the Yak Tunnel Treatment Facility, major water quality problems were observed at the confluence of the Arkansas River and California Gulch. Although the water quality problems were attributed to a variety of sources, the discharges from the two mining tunnels (Yak Tunnel and the LMDT) were thought to be the major contributors. Because both of these discharges were targeted as causing exceedances of water quality standards at the Arkansas River/California Gulch confluence, the process of developing effluent limitations for the treatment plant and the California Gulch confluence was done simultaneously to ensure consistent and equitable results.

Figure 2 below represents the location of the treatment plant and instream water quality sampling stations used in the development of effluent limitations for the treatment plant. Listed below is a detailed description of the sampling stations depicted in Figure 2.

- TC-1 Located on Tennessee Creek approximately 1.25 miles upstream of the confluence with the East Fork of the Arkansas River.

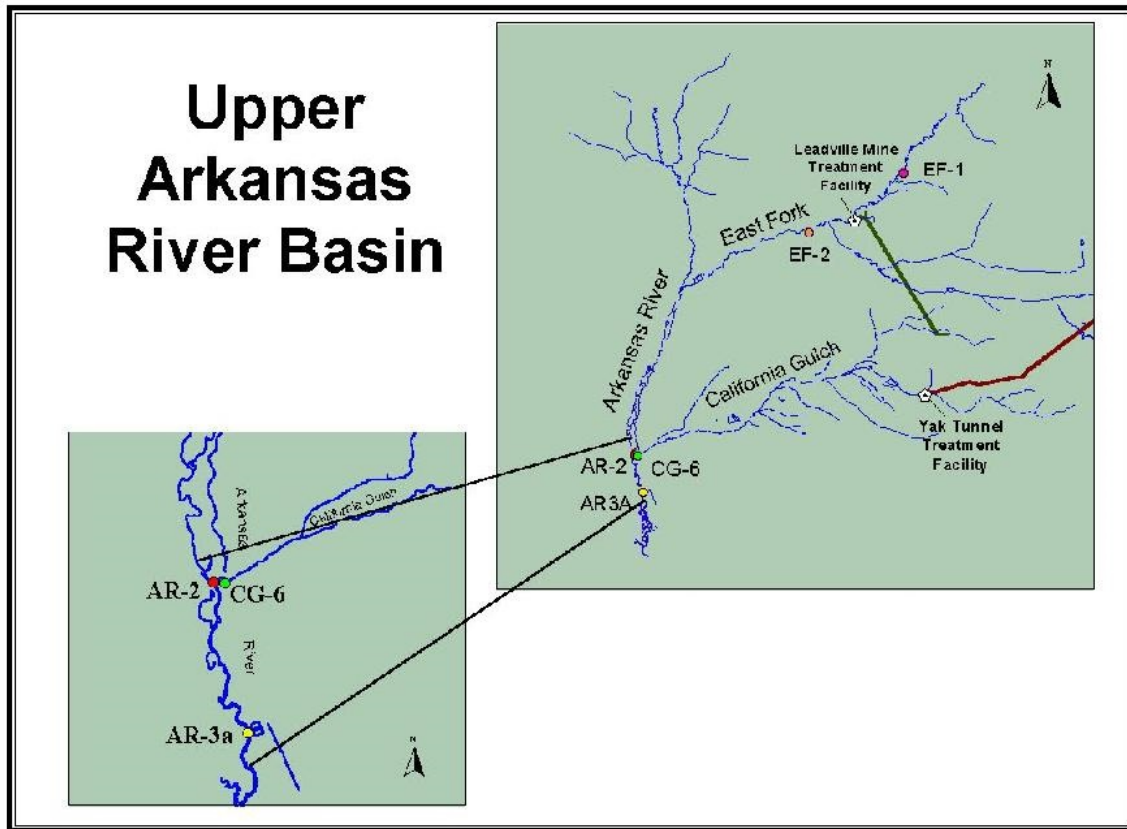
- EF-1 Located on the East Fork of the Arkansas River at Colorado Highway 91.

- EF-2 (USGS Station 07079300) Located on the East Fork of the Arkansas River, 20 feet downstream from U.S. Highway 24, 0.35 miles downstream of the confluence with the un-named drainage way tributary that receives discharge from the treatment plant and 2.2 miles upstream from the confluence with the Tennessee Creek.

- CG-6 Located on California Gulch, upstream of the confluence with the Arkansas River, downstream of Malta Gulch.

- AR-3a Located on the Arkansas River, approximately 370 feet downstream of the confluence with California Gulch.

Figure 2. Upper Arkansas River Basin Sample Station Locations



Sample Station Locations, Upper Arkansas River.

In addition to the above sampling locations, the facility's effluent data was considered equivalent to the water quality of the unnamed drainage way tributary to the East Fork of the Arkansas River (Segment 5). This was primarily due to the fact that the treatment plant's effluent makes up the entirety of the unnamed drainage way tributary at the location of the discharge (i.e. the tributary begins at the treatment plant's discharge and there is therefore, no upstream flow and secondly, there are no known sampling locations on the unnamed drainage way tributary).

The following sections will identify and explain the development process for the effluent limitations further.

Water Quality Standards

Segment 5 of the Upper Arkansas River Basin

Evaluation of effluent limitations for the treatment plant began with review of the water quality standards and calculation of corresponding water quality criteria applicable for Segment 5 of the Upper Arkansas River Basin. A hardness of 389 mg/L (as calcium carbonate) was used in the calculation of effluent limitations (for Cd, Cu, Pb, Ag and Zn) based on aquatic life criteria

which vary with hardness. This hardness value is based on the lower 95% confidence interval of the average hardness for samples collected weekly at Outfall 001 for the past five years.

As mentioned previously, the monitoring data collected at Outfall 001 was considered to be equivalent to the water quality of the unnamed drainage way tributary of the Arkansas River for permit development purposes. The criteria derived represent the allowable concentrations of specific chemicals in the water that are protective of human health and aquatic life. The criteria are derived to protect the designated use of the specified water body. The applicable designated use classifications and numeric standards for Segment 5 can be found in Table 1. Using a hardness value of 389 mg/L (as calcium carbonate), EPA calculated the below hardness-dependent effluent limitations in Table 5.

Table 5. Water Quality Based Effluent Limitations based upon Upper Arkansas River Basin Segment 5

Water Quality Based Effluent Limitations based upon Upper Arkansas River Basin Segment 5 (Hardness = 389 mg/L)		
Pollutant (ug/L)	30-day Average (chronic)	Daily Max (acute)
Cd	1.2	5.6
Cu	28.6	48.3
Pb	10.6	272.9
Ag	0.78	21
Zn	417	550

Since the treatment plant’s discharge is the most upstream source of the unnamed drainage way tributary and there are no known other sources that discharge to the unnamed drainage way tributary downstream, the above calculated effluent limitations would be applied “end-of-pipe” because of a lack of dilution and/or mixing in the unnamed drainage way tributary.

Segments 2a and 2b of the Upper Arkansas River Basin

To ensure protection of the downstream water quality standards (Segment 2a and 2b of the Upper Arkansas River Basin), a comparison of the downstream water quality standards was conducted to ensure that the WQBELs calculated in Table 5 would be protective. Therefore, after review of the water quality standards and calculation of corresponding water quality criteria applicable for Segment 5 of the Upper Arkansas River Basin, a similar review was conducted on Segment 2a and 2b of the Upper Arkansas River Basin.

As mentioned above, in previous permits final effluent limits were based upon the high and low stream flows of the Arkansas River. The high flow season was considered to be May through

August and the low flow season was considered to be September through April. To ensure protection of downstream water quality standards, a high and low flow WQBEL analysis as described below was conducted.

Water quality standards were evaluated downstream of the East Fork of the Arkansas River at sample station EF-2 and downstream of the Arkansas River/California Gulch confluence, at sample station AR-3a. Sample station EF-2 is located in Stream Segment 2a of the East Fork. Sample station AR-3a is located in Stream Segment 2b of the Upper Arkansas River Basin. These locations were chosen for analysis because Segment 2b has displayed water quality standard exceedances in the past and discharges from the treatment plant must not add to those exceedances. Figure 2 shows the locations of sample station EF-2 and AR-3a. The applicable designated use classifications and numeric standards for these two segments can be found in Table 1.

At sample station EF-2, a hardness (as calcium carbonate) of 90 mg/L was used in the calculation of high-flow season WQBELs based on aquatic life criteria which vary with hardness (Cd, Cu, Pb, Ag and Zn). This hardness value is based on the lower 95% confidence interval of the average hardness for surface waters sampled at sample station EF-2 during May through August. The hardness data were from samples collected during the period of May 2010 through August 2014.

A hardness (as calcium carbonate) of 181 mg/L was used in the calculation of low-flow season WQBELs based on aquatic life criteria which vary with hardness (Cd, Cu, Pb, Ag and Zn). This hardness value is based on the lower 95% confidence interval of the average hardness for surface waters sampled at sample station EF-2 during the months of September through April. The hardness data were from samples collected during the period of October 2009 through September 2014.

At sample station AR-3a, a hardness (as calcium carbonate) of 73 mg/L was used in the calculation of high-flow season WQBELs based on aquatic life criteria which vary with hardness (for Cd, Cu, Pb, Ag and Zn). This hardness value is based on the lower 95% confidence interval of the average hardness for surface waters sampled during the months of May through August. The hardness data were from samples collected during the period of May 2000 through August 2005. This is the most recent data available for AR-3a.

A hardness (as calcium carbonate) of 122 mg/L was used in the calculation of low-flow season WQBELs based on aquatic life criteria which vary with hardness (Cd, Cu, Pb, Ag and Zn). This hardness value is based on the lower 95% confidence interval of the average hardness for surface waters sampled during the months of September through April. The hardness data were from samples collected during the period of January 2000 through October 2005. This is the most recent data available for AR-3a.

Seasonal Loading Analysis

The next step in deriving final WQBELs for the treatment plant was to complete a seasonal loading analysis. The purpose of the loading analysis was ensure protection of downstream water quality standards by determining the seasonal stream capacity for various pollutants in the discharge from the treatment plant, while maintaining ambient water quality at the East Fork, Segment 2a (EF-2) and below the Arkansas River/California Gulch confluence, Segment 2b (AR-3a).

A treatment plant seasonal loading analysis was conducted using a steady-state model, based on a basic mass balance equation. This approach allows the mass of pollutants upstream of a given point to be equated with an allowable mass of pollutants downstream after complete mixing. This model assumes that pollutants are conservative and additive, and considers only dilution as a mitigating factor affecting the pollution concentration in-stream. The equations can be viewed below, as well as variable definitions.

Segment 2a, EF-2:

$$\text{LMDT available loading} = (Q_{\text{EF-2}} C_{\text{EF-2}} - Q_{\text{EF-1}} C_{\text{EF-1}}) * \text{CF} \quad (\text{Equation 1})$$

LMDT available loading = in-stream available loading capacity for pollutants from LMDT in lbs/day.

$Q_{\text{EF-2}}$ = stream flow at sample station EF-2 (cfs).

$C_{\text{EF-2}}$ = pollutant-specific water quality criteria at sample station EF-2 ($\mu\text{g/L}$).

$Q_{\text{EF-1}}$ = stream flow at sample station EF-1 (cfs).

$C_{\text{EF-1}}$ = background pollutant concentration at sample station EF-1 ($\mu\text{g/L}$).

CF = unit conversion factor, 0.0053876

In-stream flow value $Q_{\text{EF-2}}$, used in the above mass balance equation, was calculated using the Colorado Department of Public Health and Environment's (CDPHE) modified DFLOW Model. The data were obtained from the USGS gage station 07079300 (EF-2) from 2006 to 2014. This model calculates a biological based of 1 day averaging period for 3 years(1E3) low flow for acute toxicity and a 30 day averaging period for 3 years recurrence frequency (30E3) low flow for chronic toxicity. Table 3b. For comparison, the DFLOW model calculates a lower flow value for $Q_{\text{EF-2}}$ than the average DMR low flow value.

Flow values for $Q_{\text{EF-1}}$ used in the mass balance equation were calculated using flow data from monthly Discharge Monitoring Reports from the treatment plant. For both the chronic and acute toxicity analysis, the seasonal average discharge flow was used in the mass balance equation.

Background pollutant concentration values used in the mass balance equation ($C_{\text{EF-1}}$) were calculated using monitoring data obtained from CDPHE. The pollutant concentration data were from samples collected during the period of January 2000 through August 2005. This is the most recent data available for EF-1. For chronic toxicity analysis, the seasonal average value for each

metal parameter except Cadmium was used in the mass balance equation. For Cadmium, the CDPHE's technical analysis method for the existing quality of 85th percentile was used. For acute toxicity analysis, the 95th percentile of the seasonal maximum value was used for each sample station.

Segment 2b, AR-3a:

LMDT available loading = $(Q_{AR-3a} C_{AR-3a} - Q_{CG-6} C_{CG-6} - Q_{TC-1} C_{TC-1} - Q_{EF-1} C_{EF-1}) * CF$
(Equation 2)

LMDT available loading = in-stream available loading capacity for pollutants from LMDT in lbs/day.

Q_{AR-3a} = stream flow at sample station AR-3a (cfs).

C_{AR-3a} = pollutant-specific water quality criteria at sample station AR-3a ($\mu\text{g/L}$).

Q_{CG-6} = stream flow at sample station CG-6 (cfs).

C_{CG-6} = background pollutant concentration at sample station CG-6 ($\mu\text{g/L}$).

Q_{TC-1} = stream flow at sample station TC-1 (cfs).

C_{TC-1} = background pollutant concentration at sample station TC-1 ($\mu\text{g/L}$).

Q_{EF-1} = stream flow at sample station EF-1 (cfs).

C_{EF-1} = background pollutant concentration at sample station EF-1 ($\mu\text{g/L}$).

CF = unit conversion factor, 0.0053876

Instream flow values Q_{AR-3a} , Q_{CG-6} , and Q_{TC-1} used in the mass balance equation were calculated using flow data provided by Tetra-Tech RMC, a superfund contractor of CDPHE. Due to the seasonal analysis approach, an average seasonal flow was used for chronic toxicity analysis and the lower 95th percentile flow was used for acute toxicity analysis.

Again, the flow values for Q_{EF-1} used in the mass balance equation were calculated using flow data from monthly Discharge Monitoring Reports from the treatment plant. For both the chronic and acute toxicity analysis, the seasonal average discharge flow was used in the mass balance equation.

Background pollutant concentration values used in the mass balance equation (C_{AR-3a} , C_{CG-6} , and C_{TC-1}) were calculated using monitoring data obtained from Tetra-Tech RMC, a superfund contractor of CDPHE. The pollutant concentration data for C_{AR-3a} and C_{CG-6} were from samples collected during the period of April 2009 through August 2013 with the exception of silver data which was from samples taken May 2000 through October 2005 since this was the most recent available data for silver. The pollutant concentration data for C_{TC-1} were from samples collected during the period of September 1998 through October 2005. This was the most recent data available for C_{TC-1} . For chronic toxicity analysis, the seasonal average value for each metal parameter except Cadmium was used in the mass balance equation. For Cadmium, the CDPHE's technical analysis method for the existing quality of 85th percentile was used. For acute toxicity analysis, the 95th percentile of the seasonal maximum value was used for each sample station.

Again, the background pollutant concentration values used in the mass balance equation (C_{EF-1}) were calculated using monitoring data obtained from CDPHE. For chronic toxicity analysis, the seasonal average value for each metal parameter except Cadmium was used in the mass balance equation. For Cadmium, the CDPHE's technical analysis method for the existing quality of 85th percentile was used. For acute toxicity analysis, the 95th percentile of the seasonal maximum value was used for each sample station.

The treatment plant available loading, equated through use of the mass balance Equation 1 and Equation 2 above, represents the extent to which pollutants can be discharged from treatment plant while maintaining water quality criteria at the Arkansas River/California Gulch confluence.

The high flow results reveal that a negative stream capacity being exhibited for pollutant parameters of concern (As, Cd and Ag) in Segment 2a or Segment 2b. The low flow results reveal that negative stream capacity being exhibited for a pollutant parameters of concern (As, Cd and Zn) in Segment 2a or Segment 2b. The negative results indicate that there is very little or no capacity for additional pollutant loading at the Arkansas River/California Gulch confluence.

Seasonal Water Quality Based Effluent Limitations

Upon evaluation of the seasonal loading analysis results, it was deemed necessary to develop seasonal WQBELs for the treatment plant permit to compare against the WQBELs calculated in Table 5. The analysis showed capacity for copper, iron, lead, manganese, mercury and selenium. The WQBELs are "end-of-pipe" limitations based on meeting ambient water quality and protecting the designated uses of the Segment 2a and Segment 2b. The "end-of-pipe" restrictions set a numeric limit that the treatment plant effluent must meet before discharge to the receiving stream. For pollutant parameters that have negative stream capacity in either Segment 2a and/or Segment 2b, the effluent limitations were set equal to the lower Segment water quality criterion. The seasonal WQBELs were based upon the numeric standards set by the Colorado Water Quality Control Commission for Segment 2a and Segment 2b of the Upper Arkansas River Basin.

Table 6. Seasonal WQBELs based upon Upper Arkansas River Basin Segments 2a and 2b

Calculated Seasonal WQBELs based upon Upper Arkansas River Basin Segments 2a and 2b					
Pollutant (ug/L)	High Flow (May - August)			Low Flow (September - April)	
	30-day average (chronic)	Daily Max (acute)	2 year average	30-day average (chronic)	Daily Max (acute)
Cd	0.9	1.3		2.3	2
Cu	23	23	19	14	45
Pb	2.2	52		15.3	255
Ag	0.062	1.2		0.54	11.6
Zn	84	352		129	556

A comparison of the WQBEL calculated based upon the Upper Arkansas River Basin Segments, 2a and 2b was conducted and is outlined in Table 7 below:

Table 7. Comparison of WQBELs for Upper Arkansas River Basin Segment 5 versus Segments 2a and 2b

Comparison of WQBELs for the Upper Arkansas River Basin Segments 5 versus 2a/2b							
Pollutant (ug/L)	Chronic Limits (30-day average)			Acute Limits (Daily Max)			2-Year Average
	Segment 5	Segment 2a/2b		Segment 5	Segment 2a/2b		Segment 2a/2b
		High Flow	Low Flow		High Flow	Low Flow	High Flow
Cd	1.2	0.9	2.3	5.6	1.3	2	
Cu	28.6	23	14	48.3	23	45	19
Pb	10.6	2.2	15.3	272.9	52	255	
Ag	0.78	0.062	0.54	21	1.2	11.6	
Zn	417	84	129	550	352	556	

Based upon Table 7 above, almost every WQBEL for Segment 2a/2b are more stringent than Segment 5. Therefore, every WQBEL for Cd, Cu, Pb, Ag and Zn were based upon being protective of Segments 2a and 2b. As mentioned previously, there is no longer a need for seasonal limits and the facility’s WQBELs will be the most stringent of the high flow and low flow calculated WQBEL. Tables 8 and 9 below outlines the final WQBELs using the described methodology.

Table 8. Comparison of Newly Calculated Chronic Limits to Previous Permit Limits

Comparison of Newly Calculated Chronic Limits to Previous Permit Limits				
	Most Stringent Limit from Table 7	Previous Permit Limit (high flow)	Previous Permit Limit (low flow)	FINAL WQBEL
Pollutant (ug/L)	30-d average (chronic)	30-d average (chronic)	30-d average (chronic)	30-d average (chronic)
Cd	0.9	0.9	1.1	0.9
Cu	14	23	14	14
Pb	2.2	1.5	5.3	1.5
Ag	0.062	0.035	0.05	0.035
Zn	84	84	129	84

Table 9. Comparison of Newly Calculated Acute Limits to Previous Permit Limits

Comparison of Newly Calculated Acute Limits to Previous Permit Limits				
	Most Stringent Limit from Table 7	Previous Permit Limit (high flow)	Previous Permit Limit (low flow)	FINAL WQBEL
Pollutant (ug/L)	Daily Max (acute)	Daily Max (acute)	Daily Max (acute)	Daily Max (acute)
Cd	1.3	1.2	2.9	1.2
Cu	23	23	25	23
Pb	52	32	140	32
Ag	1.2	0.83	4.8	0.83
Zn	352	329	284	284

A comparison of the new limits calculated in Tables 8 and 9 were compared to the previous permit limits and the most stringent limits were selected as shown in Table 10 below. To ensure the State of Colorado antidegradation requirements are met, a no increased loading (NIL) will be allowed and to comply with anti-backsliding requirements, the most stringent limits will apply. Additionally, because seasonal limits are no longer warranted, the most stringent chronic, acute, and 2-year average limits (where applicable) will apply year-round.

Table 10. Summary of Final WQBEL Permit Limits

Summary of Final WQBEL Permit Limits			
Pollutant (ug/L)	30-d average (chronic)	Daily Max (acute)	2 year average
Cd	0.9	1.2	
Cu	14	23	19
Pb	1.5	32	
Ag	0.035	0.83	
Zn	84	284	

Discussion on Permit Effluent Limitations and Monitoring Requirements

Permit effluent limitations are based upon a reasonable potential to be present in the discharge as determined from the previous discharge monitoring report data.

Flow

Effluent flow limitations are based upon the facility design flows. The 30-day average limitation is based on the facility mean design flow, 2.5 MGD. The daily maximum limitation is based on the facility peak design flow of 3.2 MGD.

Total Suspended Solids (TSS)

Previous permit limits will be carried forward in the renewed permit based on the antibacksliding provisions.

Monitoring requirements for TSS remain at daily monitoring.

Aluminum

Due to the absence of numeric water quality criteria for aluminum in Segment 5 and downstream Segments 2a and 2b of the Upper Arkansas River Basin, the effluent limitations from the previously issued permit will carry over to this permit. The continuation of the acute and chronic aluminum effluent limitations is in accordance with regulatory antibacksliding requirements of 40 CFR 122.44(l).

Aluminum monitoring will remain on a monthly basis.

Arsenic

Results of the loading analysis indicated a negative capacity for additional arsenic loading from

the treatment plant for chronic limitations in Segment 2a.

Arsenic monitoring and limitations were removed from the previous permit since the treatment plant DMR data indicated that almost all of the arsenic monitoring results were at the detection level at that time, 2.5 µg/L for 30-day average, and 5 µg/L for daily maximum. However, the water quality standard of Segment 5 of the Upper Arkansas River Basin has been temporary modified to 0.02 µg/L (As(ch)=hybrid). Yet, for discharges existing on or before 6/1/2013 (which would include LMDT), the temporary modification adopted for chronic arsenic is “current condition”, expiring on 12/31/2021. Therefore, EPA will require arsenic monitoring to gain information regarding the current condition of Segment 5. Effluent data will be used to assess the current conditions of Segment 5 because the segment flow is dominated by the LMDT discharge. In the future, arsenic limits will be set to maintain the current condition.

Segments 2a and 2b of the Upper Arkansas River Basin do not list a temporary modification for arsenic and based upon the water quality standards for these segments, the effluent would not have the reasonable potential to warrant monitoring or limits.

Since the arsenic water quality standard for Segment 5 is more protective than Segments 2a and 2b, arsenic requirements will be based upon Segment 5 water quality standards and arsenic monitoring will be required monthly.

Cadmium

The treatment plant monitoring data showed that the pollutant was repeatedly measured at levels well below the previously permit limits.

Effluent limitations for cadmium will be based on WQBELs. Results of the loading analysis indicated a negative capacity for additional cadmium loading from the treatment plant for chronic and acute limitations in the Segment 2b. Due to the lack of downstream capacity, NIL will be allowed in the new permit (per State of Colorado antidegradation requirements) and in accordance with regulatory antibacksliding requirements of 40 CFR 122.44(l), the cadmium limits will be the most stringent limits from the previous permit and will be applied year-round.

Cadmium monitoring will remain on a weekly basis.

Copper

The treatment plant monitoring data showed that the pollutant was repeatedly measured at levels well below the previously permit limits.

Effluent limitations for copper will be based on WQBELs. Results of the loading analysis indicated there is assimilative capacity for additional copper loading from the treatment plant for chronic and acute limitations in Segment 5 and 2a/2b. However, NIL will be allowed in the new

permit (per State of Colorado antidegradation requirements) and in accordance with regulatory antibacksliding requirements of 40 CFR 122.44(l), the copper limits will be the most stringent chronic, acute, and 2-year average limits from the previous permit and will be applied year-round.

Copper monitoring will remain on a monthly basis.

Iron

Effluent limitations for iron will be based on WQBELs. Results of the loading analysis indicated a negative capacity for additional iron loading from the treatment plant for chronic limitations in Segment 2b. Due to the lack of downstream capacity, NIL will be allowed in the new permit (per State of Colorado antidegradation requirements) and in accordance with regulatory antibacksliding requirements of 40 CFR 122.44(l), the iron limits will be the most stringent limits from the previous permit and will be applied year-round.

Iron monitoring will remain on a monthly basis.

Lead

Effluent limitations for lead will be based on WQBELs. Results of the loading analysis indicated a negative capacity for additional lead loading from the treatment plant for chronic limitations in Segment 2b. Due to the lack of downstream capacity, NIL will be allowed in the new permit (per State of Colorado antidegradation requirements) and in accordance with regulatory antibacksliding requirements of 40 CFR 122.44(l), the lead limits will be the most stringent limits from the previous permit and will be applied year-round.

Lead monitoring will remain on a weekly basis.

Manganese

The treatment plant monitoring data showed that the pollutant was repeatedly measured at levels well below permit limits.

Effluent limitations for manganese are based upon WQBELs. Results of the loading analysis indicated there is assimilative capacity for additional manganese loading from the treatment plant for chronic and acute limitations in Segment 5 and 2a/2b. The previous permit contained a chronic total recoverable effluent limitation of 1000 µg/L for manganese. No surface water supply has been identified in Segments 5, 2a or 2b. Therefore, the monthly average limit of 1000 µg/L will be carried forward in the renewed permit based on NIL will be allowed in the new permit (per State of Colorado antidegradation requirements) and in accordance with regulatory antibacksliding requirements of 40 CFR 122.44(l).

Acute manganese limits are based upon Segment 5 since the WQBEL for this Segment is the most protective. The acute limitation of 4,694 µg/L also results in NIL since the previous permit acute limits were 13,300 µg/L (high flow) and 5,670 µg/L (low flow). The 2-year average limit has been removed from this permit since the new year-round permit chronic limit (1,000 µg/L) is more stringent than the previous permit 2-year average limit of 2,680 µg/L.

Manganese monitoring will remain on a monthly basis.

Mercury

The treatment plant monitoring data showed that the pollutant was repeatedly measured at levels well below permit limits.

Effluent limitations for mercury are based upon WQBELs. Results of the loading analysis indicated there is assimilative capacity for additional mercury loading from the treatment plant for chronic limitations in Segments 5, 2a and 2b. However, NIL will be allowed in the new permit (per State of Colorado antidegradation requirements) and in accordance with regulatory antibacksliding requirements of 40 CFR 122.44(l), the mercury limits will be the most stringent chronic limits from the previous permit and will be applied year-round. The 2-year average limit has been removed from this permit since the new year-round permit chronic limit (0.01 µg/L) is more stringent than the previous permit 2-year average limit of 0.02 µg/L.

Mercury monitoring will remain on a weekly basis.

Silver

The treatment plant monitoring data showed that the pollutant was repeatedly measured at levels well below permit limits.

Effluent limitations for silver are based upon WQBELs. Results of the seasonal loading analysis indicated a negative capacity for additional silver loading at treatment plant for acute limitations in Segment 2b. Due to the lack of downstream capacity, NIL will be allowed in the new permit (per State of Colorado antidegradation requirements) and in accordance with regulatory antibacksliding requirements of 40 CFR 122.44(l), the silver limits will be the most stringent chronic and acute limits from the previous permit and will be applied year-round.

Silver monitoring will remain on a weekly basis.

Selenium

The treatment plant monitoring data showed that the pollutant was repeatedly measured at levels well below permit limits.

Effluent limitations for selenium are based upon WQBELs. Results of the loading analysis indicated there is assimilative capacity for additional selenium loading from the treatment plant for chronic and acute limitations in Segments 5, 2a and 2b. Per CDPHE Regulation 31, the aquatic life table value criteria for selenium is 4.6 ug/l chronic and 18.4 ug/l acute. These values, which are measurements of waterborne selenium, will serve as interim guidance for the Commission in establishing numeric standards for specific basins and individual stream segments. The new interim numeric criteria are based upon EPA's 1987 Selenium Criteria Document. The EPA selenium criteria values of 4.6 ug/l chronic and 18.4 ug/l acute are not expected to be the appropriate standards for each and every waterbody within Colorado.

Therefore, the permit limits will be 4.6 ug/l chronic and 18.4 ug/l acute and will be applied year-round. This will also result in NIL will be allowed in the new permit (per State of Colorado antidegradation requirements) and in accordance with regulatory antibacksliding requirements of 40 CFR122.44(1). The 2-year average limit has been removed from this permit since the new year-round permit chronic limit (4.6 µg/L) is more stringent than the previous permit 2-year average limit of 7.2 µg/L.

Selenium monitoring will remain on a monthly basis.

Zinc

The treatment plant monitoring data showed that the pollutant was repeatedly measured at levels well below permit limits.

Effluent limitations for zinc will be based upon on the WQBELs. Results of the seasonal loading analysis indicated a negative capacity for additional zinc loading at treatment plant for acute limitations in Segment 2b. Due to the lack of downstream capacity, NIL will be allowed in the new permit (per State of Colorado antidegradation requirements) and in accordance with regulatory antibacksliding requirements of 40 CFR 122.44(1), the zinc limits will be the most stringent of the chronic and acute limits from the previous permit and will be applied year-round. Zinc monitoring will remain on a weekly basis.

Whole Effluent Toxicity (WET)

The treatment plant DMR data indicates no WET violations in the past permit cycles and was therefore, not included in the previous permit. Based on reasonable potential analysis, WET limitations and monitoring requirements will not be included in this permit.

Environmental Justice Analysis

An environmental justice evaluation of the LMDT permit was conducted at the time of the previous permit issuance (2008). Since the permit limits in this renewal permit are the same or more stringent than the previous permit, a new environmental justice evaluation was not

performed.

Endangered Species Act (ESA) Requirements

Section 7(a) of the Endangered Species Act requires federal agencies to ensure 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. According to U.S. Fish & Wildlife Service, Information for Planning and Conservation (IpaC) website (<https://ecos.fws.gov/ipac/>) the federally listed threatened and endangered species found in the project area include:

<u>Species</u>	<u>Status</u>
Greenback Cutthroat trout (<i>Oncorhynchus clarki stomias</i>)	T
Penland alpine fen mustard (<i>Eutrema penlandii</i>)	T
Uncompahgre fritillary butterfly (<i>Boloria acrocneuma</i>)	E
Canada Lynx (<i>Lynx canadensis</i>)	T

T = Threatened E = Endangered

It does not appear that discharges from LMĐT will result in significant impact to any endangered species or critical habitats. This permit renewal is not likely to adversely affect any of the species listed by the U. S. Fish and Wildlife Service under the Endangered Species or critical habitats of the Upper Arkansas River Basin. During the public comment period, EPA notified the U. S. Fish and Wildlife Service requesting their input on the potential effects on endangered species or critical habitats and EPA’s preliminary determination in this regard. On September 16, 2016, the U. S. Fish and Wildlife Service concurred with EPA’s determination that the Permit is not likely to adversely affect any species under ESA.

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 treatment plant to assess this action’s potential effects on any listed or eligible historic properties or cultural resources. This correspondence is typically conducted with the State Historic Preservation Office (SHPO).

The EPA does not anticipate any impacts on listed/eligible historic or cultural properties because this permit is a renewal and will not be associated with any new ground disturbances or changes to the volume or point of discharge. During the public comment period, EPA notified the State Historic Preservation Office (SHPO) of the planned issuance of this NPDES permit and requested their input on the potential effects on historic properties and EPA’s preliminary determination in this regard. EPA did not receive a response from the SHPO.

Discharge Monitor Reports

Starting January 1, 2017, permittees must electronically report DMRs using *NetDMR*. If you have any DMR questions or concerns regarding *NetDMR*, please contact EPA’s Policy, Information

Management & Environmental Justice Program, DMR Coordinator at (303) 312-6056. See Section 2.4 of the permit, Reporting of Monitoring Results for additional information.

Miscellaneous

This permit is issued for a period of five years.

Addendum:

This permit was public noticed on September 1, 2016 in the Herald Democrat. The 30 day public comment period closed on October 3, 2016. The permittee was the only commenter. The comments and EPA's response to comments are below.

The EPA did not receive the Section 401 Water Quality Certification for this permit by October 31, 2016 from CDPHE as requested in the August 30, 2016 letter. Therefore, the EPA is considered the CDPHE waived the certification requirement according to 40 CFR 124.53(c)(3).

Comments received during Public Notice:

Comments from U.S. BOR (permittee) received September 22, 2016

1. Facility Information, first page of Fact Sheet information changes are as follows:
Responsible Official: Signe Snortland, ECAO Area Manager

Contact Person and phone number: change to Operations and Maintenance Chief, with no name as the position is vacant. Use phone number 970-962-4338, that is Signe's number.

Response to Comment: EPA updated the facility/contact information in the final Fact Sheet.
2. In Fact Sheet, page 14, top paragraph line 2: "The treatment plant effluent must be monitored once during the five year permit cycle." – I believe this should read "twice" rather than once.

Response to Comment: EPA made the correction in the final Fact Sheet.

