Statement of Basis

PERMITTEE: **Merit Energy Company**

FACILITY: **Steamboat Butte Fields**

PERMIT NO: **WY-0033740**

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PERMIT TYPE: Minor Industrial (Renewal)
Indian Country

FACILITY LOCATION: SW ¼ of Section 5 and NW ¼ of Section 8, Township 3 North, Range 1 West in Fremont County, Wyoming

DISCHARGE POINT: Outfall 001, Latitude 43.256111°, Longitude 108.905833°
Outfall 002, Latitude 43.252222°, Longitude 108.894444°

Background Information

The U.S. Environmental Protection Agency (EPA) directly implements the Clean Water Act (CWA) NPDES program on Indian country lands within the State of Wyoming. This facility is located on "Indian country" land as defined at 18 U.S.C. § 1151. The EPA has not approved the Tribes or the State of Wyoming to implement the CWA NPDES program in Indian country.

This Permit authorizes the discharge of produced water from Outfall 001and fresh water supply system from Outfall 002 at the oil production wastewater treatment facilities for the Merit Energy Company, Steamboat Butte Fields oil production facility located in Fremont County, Wyoming. Refer to Figure 1 for location map. This facility is located on Tribal trust land on the Wind River Indian Reservation. This Permit was transferred from Marathon Oil Company to Merit Energy Company effective December 1, 2016.

In 2012, Marathon Oil Company performed a Toxicity Reduction Evaluation of the water discharged at Outfall 001. They identified sulfide as the toxicant of concern and evaluated treatment techniques that will result in compliance with Whole Effluent Toxicity standards. Beginning in 2015, Marathon

constructed and began operating a treatment system with aeration terraces and biological polishing processes to reduce sulfide levels of the produced water.

Prior to the sulfide treatment system, produced oil, water, and gas are separated in pressure vessels and skim tanks by gravity, heat and emulsion breaking chemicals. The water is discharged to a series of settling ponds where the remaining oil is removed by floatation and skimming and then goes to the sulfide treatment system. The sulfide treatment system uses a series of berms and water collection and distribution channels to manage flow over the terrace aeration cells. Biological polishing of the effluent occurs in the vegetative filter and retention pond. The design and operation of this system is based on two sulfide treatment technologies. The first is the oxidation of sulfide to sulfate, which will then precipitate from the solution. The second is metabolism of sulfide through biological activity, which occurs throughout the system to remove a significant portion of sulfide and polish the effluent prior to discharge to Outfall 001. A flow diagram of Outfall 001 is shown in Figure 2. Figure 2 also shows some of the produced water is being injected into the C-3 low pressure and E-5 high pressure injection plants. These injection points are not subject to this Permit and are permitted under the Underground Injection Control program.

Outfall 1 is located at approximately 43.260278°, 108.904444°. From that point, the discharge flows approximately 900 feet through a man-made wetland to a small, named pond (the "Upper Mission pond"). There is an outlet from the Upper Mission pond through which discharges flow about 1000 feet to another, larger pond (the "Lower Mission pond") in an area called Mexican Flat. The Permittee has requested that the permitted outfall be moved from its current location above Upper Mission pond to the outlet from the Upper Mission pond at approximately 43.256111°, 108.905833°. The Permittee asserts that the Upper Mission pond is a waste treatment system that is not waters of the United States. The EPA has reviewed a variety of sources and concluded that the Upper Mission pond is not waters of the United States. As a result, the EPA is moving the permitted outfall to the outlet from the Upper Mission pond.

In making this determination, the EPA reviewed the following sources: USGS 1:24000 scale topographic maps of the site (Lookout Butte SW Quadrangle) from 1952, 1978, and 2017; aerial photographs of the area from 1994, 2006, 2013 and 2018 available from Google Earth; Google Earth elevation mapping; and the U.S. Fish and Wildlife Services National Wetlands Inventory (NWI).

The Upper Mission pond is geographically isolated from the Lower Mission pond and its natural water source. In both the 1952 and the 1978 maps, the Upper Mission pond is shown to be a dry depression approximately 0.5 acres in area. The Lower Mission pond in Mexican Flat is identified in all three USGS maps, as well as on the NWI, as an intermittent lake. On the 1952 and 1978 maps, the only source of water in the Lower Mission pond appears to be an identifiable stream channel running across Mexican Flat and into the lake from the northwest. Though none of the maps indicate the presence of water in that channel, the NWI states that the channel is seasonally flooded suggesting it may be an intermittent stream. The Upper Mission pond is separated from both the stream channel and the Lower Mission pond by a low, natural ridge. At its lowest point, the ridge is 7 feet higher than the stream channel and is generally 10-15 feet above the channel and the Lower Mission pond. The only connection between the Upper Mission pond and the Lower Mission pond, therefore, is through the outlet at 43.257222°, 108.905833°, which is located at a drop in the natural ridge 12 feet above the

lower pond.

As noted above, the 1952 and 1978 USGS maps both indicate that the location of the Upper Mission pond was a dry depression. Aerial photographs from 1994 shows only dry ground in that location. There is no water or wetland where the Upper Mission pond is located, and the Steamboat Butte facility and its outfall have not yet been built. The next available aerial photos date to 2006, and these show the facility, the outfall, and the wetlands and pond created by the flows from the outfall. Aerial photos from subsequent years, as well as the orthographic imagery on the 2017 USGS map, show the Upper Mission pond with the only differences being types of vegetation in the wetland below the permitted outfall and the volume of water in the pond. Thus, from this evidence, it appears that the Steamboat Butte facility is the sole source of water for the Upper Mission pond, and the Upper Mission pond itself was created between 1994 and 2006 with the construction of the permitted outfall. Based on these facts, the EPA has concluded that the Upper Mission pond is not a water of the US, is created by and used to help treat the flows from the Steamboat Butte facility, and as a result, that the permitted outfall is properly located at the outlet from the Upper Mission pond.

Outfall 002 only discharges fresh water that is overflow from the Steamboat Butte Field fresh water supply system. The water does not undergo treatment through a pressure vessel system. However, the water flows through a settling pond prior to discharge to Lower Mission pond. A flow diagram of Outfall 002 is shown in Figure 3.

Figure 1. Merit Energy Company – Steamboat Butte Fields Map showing location of facility and discharge points (Outfall 001 and Outfall 002)

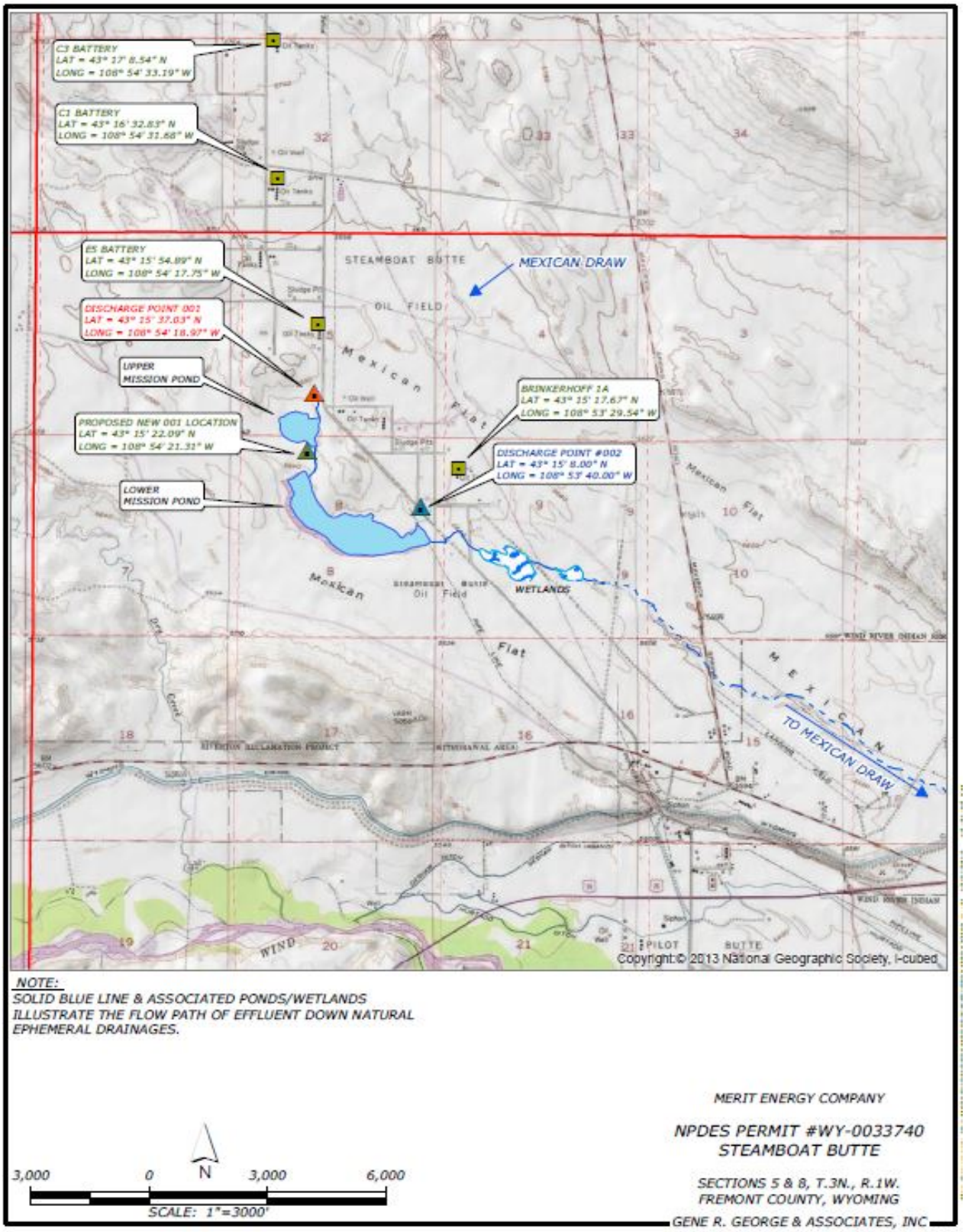


Figure 2. Merit Energy Company – Steamboat Butte Fields Flow Diagram for Outfall 001

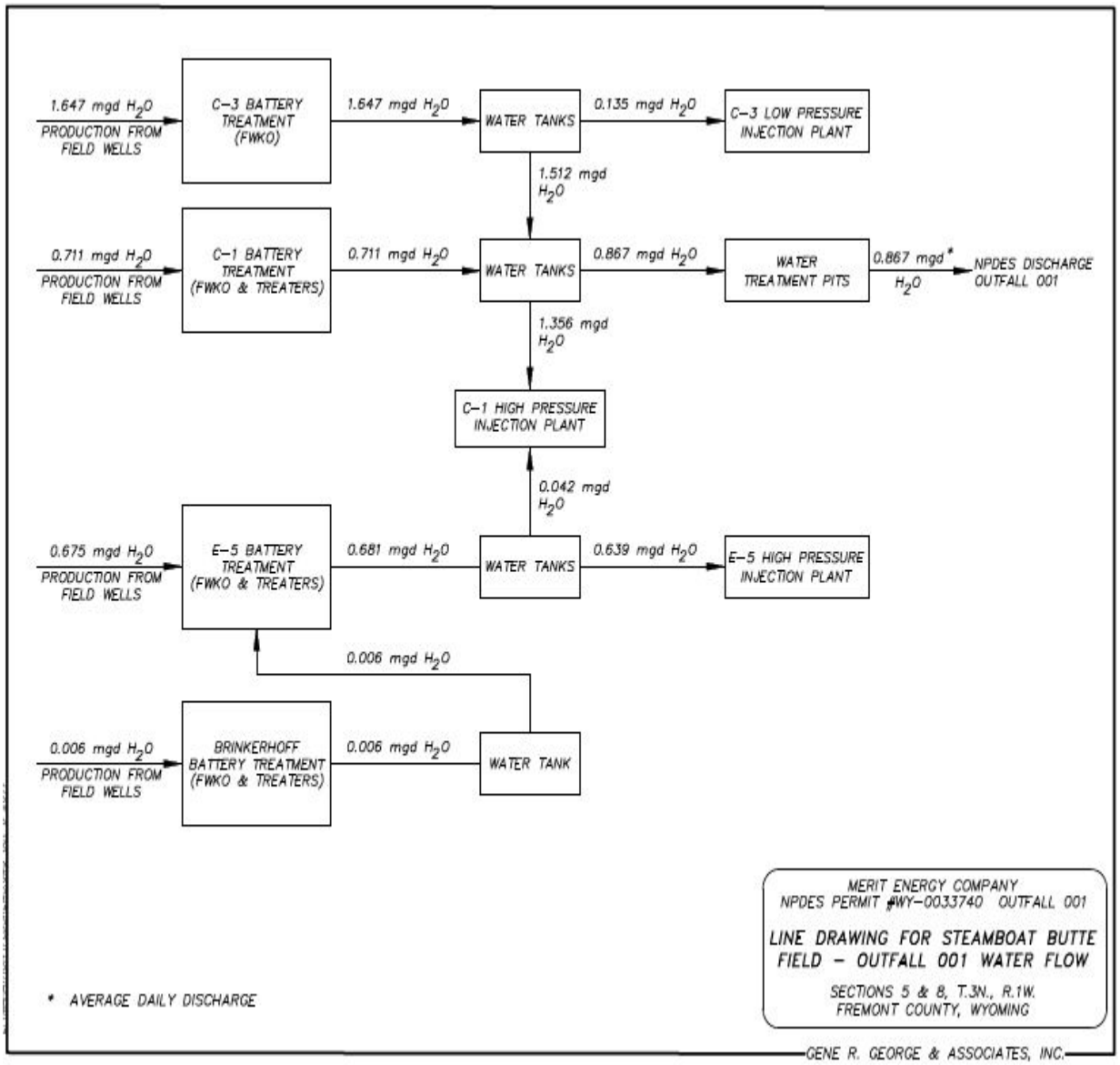
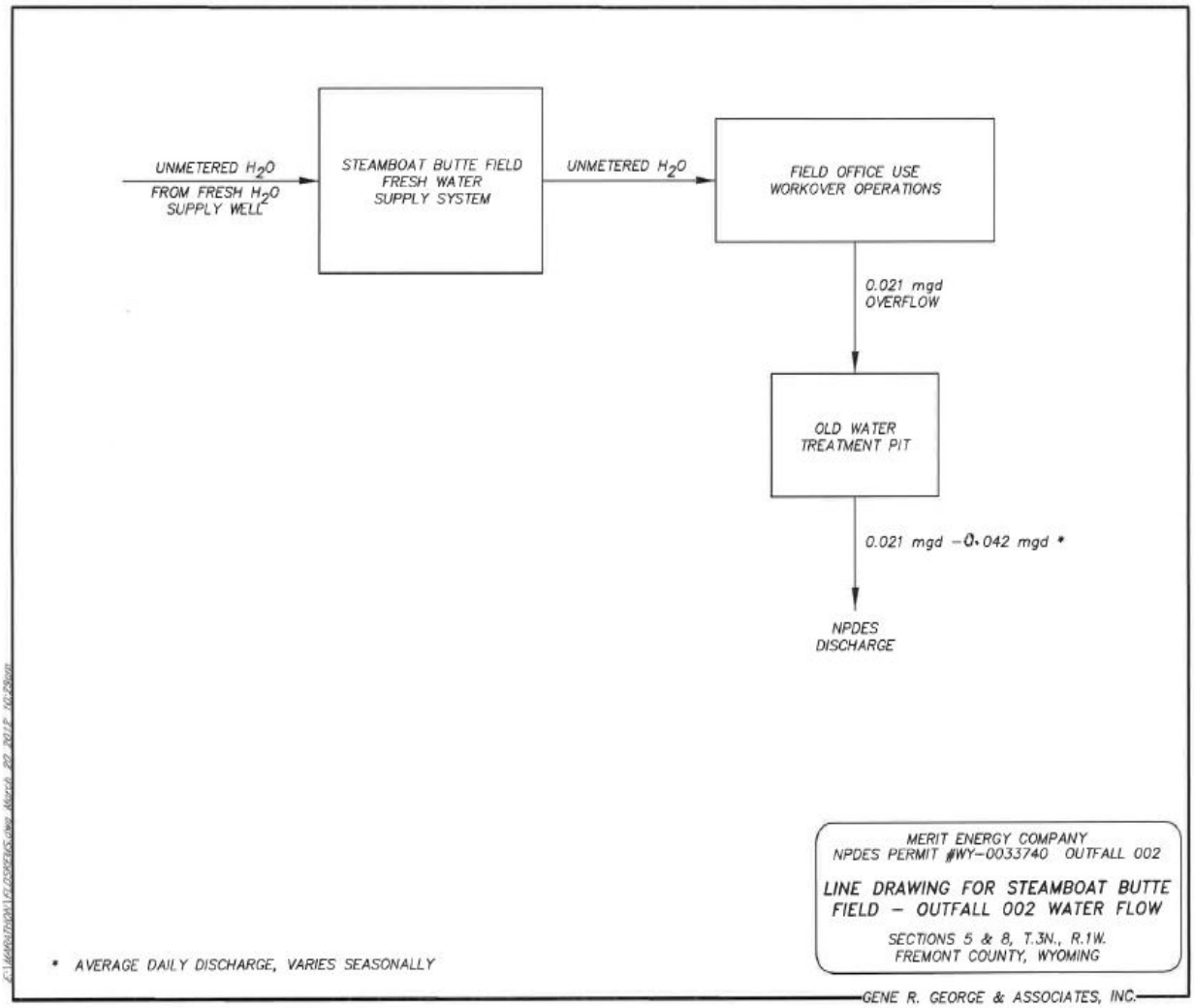


Figure 3. Merit Energy Company – Steamboat Butte Fields Flow Diagram for Outfall 002



Receiving Waters

The discharge from this facility from both permitted Outfalls will enter Lower Mission pond. As described in the previous section, Outfall 001 is below Upper Mission pond which then flows to Lower Mission pond. Outfall 002 gravity flows directly to Lower Mission pond. The produced water discharged from Outfall 001 to the end of Lower Mission pond outlet is about 0.7 mile (see Figure 1). From Lower Mission pond outlet, the produced water flows approximately 4.0 miles through an ephemeral drainage, then coalesces with seepage from the Wyoming Canal and irrigation returns for another 4.4 miles before reaching the Wind River, which is about 9.1 stream miles. Before entering a mapped intermittent (ephemeral) drainage, the produced water flows through a man-made off channel marsh and two engineered wetlands on Mexican Flat. Once water leaves the lower wetland, it enters a mapped intermittent (ephemeral) drainage, which flows across Mexican Flat to coalesce with Mexican Draw just upstream of a siphon underlying the Wyoming Canal. The portion of the Mexican Draw drainage below the Wyoming Canal and the Wind river are the first perennial waters encountered.

In the Tribes' water quality requirements, designated uses were established in which the Tribes classified the Mission Creek (upstream from Wyoming Canal) as Class 2E. Class 2E waters are those flows are

primarily the result of authorized effluent discharges and are known to support or to have the potential to support game or nongame fish populations or spawning and nursery areas at least seasonally. Uses designated on Class 2E waters include game and nongame fisheries, aquatic life other than fish, secondary contact recreation, wildlife, industry, agriculture, cultural/traditional, and aesthetic uses.

Applicable Technology and Water Quality Considerations

Treatment technology standards establish a level of effluent quality that must be met by all facilities affected by the applicable category. The level of effluent quality established by the treatment standards may not be sufficient, however, to protect all water uses. As required by the CWA, the EPA must conduct an evaluation of the numeric water quality standards for the receiving stream. The results of this evaluation are used to establish permit limits to ensure the receiving stream quality and its existing and designated uses are protected. An evaluation of the narrative water quality standards that may be applicable to the permitted facility is performed to further protect the characteristics and water quality of the receiving stream.

Technology Based Effluent Limitations

Effluent Limitation Guidelines and Standards

The Steamboat Butte Fields is an onshore facility located landward of the inner boundary of the territorial seas. The facility is also located west of the 98th meridian and, therefore, 40 CFR Part 435, Oil and Gas Extraction Point Source Category, Subpart E - Agricultural and Wildlife Water Use Subcategory (hereafter, "Subpart E") applies. Subpart E allows the discharge of produced water for which the produced water has a use in agricultural or wildlife propagation. The effluent guideline defines "use in agricultural or wildlife propagation" to mean "that the produced water is of good enough quality to be used for wildlife or livestock watering or other agricultural uses and that the produced water is actually put to such use during periods of discharge." 40 CFR § 435.51(c).

The actual effluent limitation from Subpart E is found in 40 CFR § 435.52, which provides:

(a) There shall be no discharge of waste pollutants into navigable waters from any source (other than produced water) associated with production, field exploration, drilling, well completion, or well treatment (*i.e.*, drilling muds, drill cuttings, and produced sands).

(b) Produced water discharges shall not exceed the following daily maximum limitation:
Oil and Grease: 35 mg/L.

The Permittee provided the EPA with documentation (letter dated March 28, 2012) that the discharge of produced water is actually put to use during periods of discharge by the lease holder for grazing. Correspondence from the U.S. Bureau of Indian Affairs (March 27, 2012) describes and supports the potential beneficial uses of the produced water from the facility. The beneficial uses include providing water and habitat for a variety of aquatic and terrestrial plant species, livestock, wildlife, birds, and fish, as well as supporting wetlands. Letters from ranchers, farmers, and individuals support this discharge of produced water for their beneficial uses.

Additional Technology Based Effluent Limitations

As described above, Subpart E requires that discharges of produced water must be of good enough quality to be used for wildlife or livestock watering or other agricultural uses. The EPA's previous permit limitations for total dissolved solids (TDS), chloride, and sulfate were based on similar requirements for livestock protection imposed by the State of Wyoming on oil and gas production facilities on non-Reservation land in the State of Wyoming. For this renewal Permit, TDS and chloride permit limitations are carrying over from the previous permit. For sulfate limitation, the EPA reviewed current information from literature and studies to establish limitations which are protective of livestock and wildlife consumption of the produced water discharge.

The revised sulfate limitation of 2,500 mg/L is based on new information on livestock management practices occurring on the Wind River Indian Reservation. The new information was contained in letters provided by the Eastern Shoshone Tribe on January 26, 2016, and Northern Arapaho Tribe on January 25, 2016. The sulfate limit is determined to be protective of the "good enough quality" threshold for livestock use established under Subpart E based upon the information provided to the EPA by the Eastern Shoshone Tribe and the Northern Arapaho Tribe.

For this Permit, the EPA reviewed a variety of scientific literature indicating that sulfate in livestock water may cause adverse health effects (such as encephalitis) in cattle. The literature showed the highest risk of adverse effects from sulfur exposure occurs during the summer months when livestock drink larger quantities of water. During cooler periods, there is lower risk of adverse effects because cattle drink less water. Based on this literature, the EPA established sulfate exposure thresholds to protect livestock from adverse effects by assuming that the source of water for the livestock on Range 38 was exclusively from the produced water discharge from this facility, and this water was consumed throughout the year. The supplemental information from BIA, however, indicates that this assumption is too conservative, because the livestock that have access to the produced water discharge are managed in a manner where additional fresh water sources with a much lower sulfate concentration are available for the livestock during the entire grazing season.

The Bureau of Indian Affairs (BIA) sent a letter to the Eastern Shoshone Tribe on January 21, 2016. The letter identifies multiple sources of fresh water on Range 38 that are available to livestock. These sources include several perennial streams, two wells, several springs, and larger water bodies including the Little Wind River and the Wyoming Canal. BIA stated that the cattle use all the available water sources within the Range Unit, not just the produced water.

BIA also indicated that the cattle are usually present in lowland areas near the produced water discharges only during the coolest parts of the permitted 9-month grazing period, which extends from May through January. Typically, the cattle are present from approximately May 1 to June 15, and then from September until the end of the roundup in mid-Fall. During the hottest periods of the year from late June to September, the cattle are moved to higher elevations away from the produced water discharges.

In addition to domestic cattle, BIA also noted the presence of up to 1,000 feral horses on Range 38. These horses range freely and would have access to all the feed habitat and water resources available to the domestic cattle grazed on the range. As such, their sulfate intake and exposure rates would be

similar. The EPA has reviewed the available scientific literature on horses and sulfate, has determined that the risk analyses for horses and cattle are very similar. [1,2]

The additional information from BIA thus makes clear that livestock on Range 38 are not relying solely on the discharge from this facility for drinking water, that they have access to multiple sources of fresh water, and that they are not drinking the discharge water during the hottest months of the year. As a result, the risk of adverse effects to the cattle and horses from sulfur exposure, particularly during the hottest months of the year, is anticipated to be minimal. This information supports the daily maximum sulfate limit of 2,500 mg/L.

Water Quality Based Effluent Limitations

The Tribes adopted surface water quality requirements that apply to waters on the Wind River Indian Reservation. These water quality requirements were adopted into Tribal code as Water Quality Rules and Regulations effective September 25, 2007.

The water quality requirements were submitted to the EPA for review and returned to the Tribes with comments. The Tribal requirements have not yet been formally approved by the EPA; however, the Tribes have indicated that they expect dischargers on the Reservation to comply with their adopted rules. The EPA is considering these water quality requirements when determining reasonable potential (RP) and evaluating the need for any water quality based effluent limitations (WQBELs) in this renewal Permit. The EPA relied on CWA Section 301(b)(1)(C) and principles of tribal sovereignty in establishing WQBELs based on these tribally-adopted water quality requirements.

Numeric Water Quality Requirements

To ensure that any potential permit effluent limitations based on the Tribes' adopted water quality requirements are fully protective of the designated aquatic life use, a comparison of the Tribes' criteria with the EPA's published recommended CWA Section 304(a) criteria was performed. In most cases, the Tribes' criteria were equivalent to the EPA's published criteria. The tribal exceptions were for cadmium (acute – 19.12 µg/L; chronic – 6.22 µg/L) and silver (acute – 37.44 µg/L), which were higher than the EPA's criteria. Where the two sets of criteria varied, the EPA chose the more stringent of the two. The selected criteria used in evaluation of RP and setting permit effluent limitations are listed in Table 1.

1 M. F. Raisbeck, S. L. Riker, C. M. Tate, R. Jackson, M. A. Smith, K. J. Reddy and J. R. Zygmunt (2007): Water quality for Wyoming livestock and wildlife. A review of the literature pertaining to the health effects of inorganic contaminants. (UW AES bulletin B-1183). Available at http://www.uwyo.edu/ces/pubs/b1183/ verified 23 February 2016.

2 2005. National Research Council. *Mineral Tolerance of Animals: Second Revised Edition*. Washington, DC: The National Academies Press, 2005 Available from http://www.nap.edu/catalog.php?record_id=11309 verified 23 February 2016.

Table 1 – Applicable Water Quality Criteria

Pollutant	**More Stringent of EPA Water Quality Criteria and Adopted Wind River Tribal Water Quality Criteria**	
	Aquatic Life	
	Acute (µg/L)	**Chronic (µg/L)**
Aluminum, Total	750	87
Arsenic, Total	340	150
Cadmium, Total	7.7 (1)	0.64 (1)
Chloride	860,000	230,000
Chromium (III)	1,773.3 (1)	230.7 (1)
Chromium (VI), Hexavalent	16	11
Copper, Total	49.6 (1)	29.3 (1)
Iron, Total	--	1,000
Lead, Total	280.8 (1)	10.9 (1)
Manganese, Total	9,033 (1)	3,105 (1)
Mercury, Total	1.4	0.77
Nickel, Total	1,513 (1)	168 (1)
Oil and Grease	Narrative, 10 mg/L	
pH	6.5 to 9.0	
Selenium, Total	--	5.0
Silver, Total	34.9 (1)	--
Sulfide (as H_2S)	--	2
Zinc, Total	379 (1)	382 (1)

(1) Criterion is hardness dependent. Table values adjusted for hardness using the recommended cap of 400 mg/L for waters having a hardness value greater than 400 mg/L.

The chloride limitations are based on the desired level of water quality for the receiving water as indicated by the clarifications provided by the Eastern Shoshone Tribe on January 26, 2016 and Northern Arapaho Tribe on January 25, 2016. In their letters, the Tribes explained that the aquatic life numeric criteria for chloride should not apply to waters dominated by effluent discharges from oil and gas operations. Both Tribes also expressed an interest in ensuring that discharges from these facilities be of good enough quality to protect wildlife and livestock water, and other agricultural uses; and both indicated 2,000 mg/L chloride would protect such uses. The EPA agrees that a single daily maximum limit of 2,000 mg/L chloride will ensure that the discharge is "of good enough quality" for wildlife and livestock watering, which is the threshold required by 40 CFR Part 435, Subpart E. The chloride limit, 2,000 mg/L, is identical to the limit used in the 2005 issuance of this Permit.

Narrative Water Quality Requirements

The narrative water quality requirements for the Wind River Indian Reservation were evaluated to determine if permit limits were necessary to protect the characteristics and uses of the receiving stream.

The Tribes have adopted narrative requirements for toxic pollutants, settleable solids and floating and suspended solids. The following are the Tribes' narrative water quality requirements:

> Section 13 - Toxic Pollutants. Except for those substances referenced in Section 21 (e) and (f) of these regulations, toxic pollutants attributable to or influenced by human activities shall not be present in any Reservation surface water in concentrations or combinations which constitute pollution as defined herein.
>
> Section 15 - Settleable Solids. In all Reservation waters, substances attributable to or influenced by human activities that will settle to form sludge, bank, or bottom deposits shall not be present in quantities which could result in significant aesthetic degradation, significant degradation of habitat for aquatic life or adversely affect public water supplies, agricultural or industrial water use, plant life or wildlife.
>
> Section 16 - Floating and Suspended Solids. In all Reservation surface waters, floating and suspended solids attributable to or influenced by human activities shall not be present in quantities which could result in significant aesthetic degradation, significant degradation of habitat for aquatic life or adversely affect public water supplies, agricultural or industrial water use, plant life or wildlife.

Permit Limitations Based on Narrative Water Quality Requirements

Floating, Suspended and Settleable Solids

Permit requirements for implementing the narrative requirements for discharges of floating solids and oil which causes a visible sheen or deposits on the bank or bottom are included in the renewal Permit as effluent limitations:

The concentration of oil and grease shall not exceed 10 mg/L in any sample nor shall there be a visible sheen or cause a visible sheen in the receiving waters or deposits on the bottom or shoreline of the receiving waters.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Reasonable Potential (RP) Evaluation for Water Quality Based Effluent Limitations

Effluent Monitoring Data

The permit renewal application provided data for pollutants believed to be present as well as: biochemical oxygen demand, chemical oxygen demand, total organic carbon, ammonia, temperature, pH and actual flow. The EPA also reviewed the submitted data from discharge monitoring reports (DMR) for the period of December 31, 2007 to December 31, 2016, and a toxic pollutants screen report submitted on October 25, 2007 for Outfall 001 and Outfall 002. A summary of data collected is given below in Tables 2-6:

Table 2 – DMR Data for Outfall 001

Sample Date	Specific Conductivity (µS /cm)	TDS (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Total Radium 226 (pCi/L)	Total Chromium (mg/L)	Acrylamide Monomer (mg/L)	Oil and Grease (mg/L)	pH max. (s.u.)	Flow (Outfall 001 and 002) (mgd)
12/31/2007	5,640	3,900	583	1,530	12.2				8.49	1.878
3/31/2008	5,800	3,900	605	1,630	24.4				7.5	1.651
6/30/2008	4,100	-	-	1,650	-				6.9	1.486
9/30/2008	5,630	3,660	550	1,650	15				6.7	1.44
12/31/2008	-	-	-	1,690	-				-	1.249
3/31/2009	5,800	3,960	547	1,670	16				7	1.335
6/30/2009	5,800	-	-	1,640	-			3	7	1.538
9/30/2009	5,700	3,940	-	-	21				7.1	1.415
12/31/2009	6,100	-	654	1,760	-				7.1	1.388
3/31/2010	5,750	4,130	671	1,690	20				7.1	1.44
6/30/2010	5,400	3,456	-	1,750	-			7.9	7.1	1.7
9/30/2010	5380	4,100	640	1,660	20	<0.05	<0.1	5	7.1	1.637
3/31/2011	5,380	3,940	604	1,590	16				7.4	0.973
3/31/2012	4,810	3,470	469	1,470	22	0	0	0	7.2	1.561
12/31/2012	4,860	3,670	484	1,480	26				6.8	1.535
3/31/2013	6,290	4,400	745	1,650	24.9				7	1.751
6/30/2013	6,390	4,400	535	1,590	24.9				7.1	2.097
9/30/2013	5,920	4,520	698	1,820	19.3				6.9	1.215
12/31/2013	5,920	4,520	698	1,720	19.3				7.5	0.671
3/31/2014	5,735	4,100	611	1,710	18.7				7.6	0.721
9/30/2014	5,754	3,890	641	1,810	24				7.2	1.24
12/31/2014	5,690	3,890	641	1,730	24				7.13	1.683
3/31/2015	6,030	4,320	147	2,010	19.1			0	6.8	1.572
6/30/2015	6,030	4,320	782	1,810	19.1				7.1	0.991
9/30/2015	5,260	3,810	673	1,850	18.9				6.61	1

12/31/2015	5,553	3,810	673	1,670	18.9				7.07	0.624
3/31/2016	7,002	4,980	973	1,860	19				6.98	0.592
6/30/2016	7,002	4,980	973	1,930	19				7.19	0.625
9/30/2016	5,830	4,320	687	1,770	18				7.25	0.452
12/31/2016	5,830	4,320	687	1,710	18				7.16	0.088
Minimum	4,100	3,456	147	1,470	12.2	0	0	0	6.5	0.09
Average	5,736	4,104	639	1707	19.9	0	0	3.2	7.1	1.25
Maximum	7,002	4,980	973	2010	26	0	0	7.9	8.5	2.10
Limit	7,500	5,000	2,000	3,000	60	3	1	10	6.5-9.0	3.0

Table 3 – DMR Data for Outfall 002

Sample Date	Specific Conductivity (µS /cm)	Oil and Grease (mg/L)	pH max. (s.u.)
12/31/2007	597	0	7
3/31/2008	600	0	7.4
9/30/2008	723	0	7
3/31/2009	618	0	7
6/30/2009	618	0	7
9/30/2009	627	0	7
12/31/2009	627	0	7
3/31/2010	598	0	7
6/30/2010	700	0	7.1
9/30/2010	500	0	7
3/31/2011	496	0	8.1
3/31/2012	800	0	8.2
12/31/2012	390	0	7.8
3/31/2013	400	0	7.6
6/30/2013	400	0	7.8
9/30/2013	386	0	7.6
12/31/2013	386	0	7.6

3/31/2014	6,115	0	7
6/30/2014	6,115	0	7
9/30/2014	355	0	7.18
12/31/2014	355	0	7.18
6/30/2015	405	0	7.1
9/30/2015	428	0	7.72
12/31/2015	428	0	7.72
3/31/2016	567	0	7.14
6/30/2016	567	0	7.14
12/31/2016	2792	0	7.88
Minimum	355	0	7
Average	1022	0	7.34
Maximum	6115	0	8.2
Limit	7,500	10	6.5-9.0

Table 4 – Permit Application Data

Parameter	Units	Max	No. of Samples
Biological Oxidation Demand (BOD_5)	mg/L	199	1
Chemical Oxidation Demand (COD)	mg/L	195	1
Total Organic Carbon (TOC)	mg/L	3.6	1
Total Suspended Solids (TSS)	mg/L	4.0	1
Ammonia (as N)	mg/L	1.4	1
Flow	mgd	1.992	365
Temperature (winter)	°C	47.8	1
Temperature (summer)	°C	Not Available	1
Sulfate	mg/L	1780	6
Bromide	mg/L	No Detect	1
Color	mg/L	40	1
Fluoride	mg/L	3.7	1
Nitrate-Nitrite (as N)	mg/L	Absent	-
Nitrogen, Total Organic (as N)	mg/L	Present	-
Phosphorus (as P), Total	mg/L	Absent	-
Radioactivity Alpha, Total	pCi/L	151	1
Radioactivity Beta, Total	pCi/L	115	1
Radium, Total	pCi/L	33.7	1
Radium 226	pCi/L	22	3
Sulfide (as H_2S)	mg/L	122	6
Sulfite	mg/L	270	6
Surfactants	mg/L	No Detect	1
Barium, Total	mg/L	No Detect	1
Boron, Total	mg/L	3.4	3
Cobalt, Total	mg/L	Absent	-
Iron, Total	mg/L	No Detect	2
Magnesium, Total	mg/L	68	2
Molybdenum, Total	mg/L	Absent	-
Tin, Total	mg/L	Absent	-
Silver, Total	mg/L	Absent	-
Titanium, Total	mg/L	No Detect	1
Arsenic, Total	mg/L	0.006	1
Cadmium, Total	mg/L	Absent	-
Chromium, Total	mg/L	No Detect	3
Copper, Total	mg/L	No Detect	1
Lead, Total	mg/L	Absent	-
Mercury, Total	µg/L	Absent	-
Selenium, Total	mg/L	13	3
Zinc, Total	µg/L	10	1

Benzene	µg/L	0.34	6
Ethyl benzene	µg/L	0.13	6
Toluene	µg/L	0.54	6
Naphthalene	µg/L	No Detect	1

Table 5 – Toxic Pollutants Screening Data for Outfall 001 (Sampling Date: 10/25/07)

Parameter	**Units**	**Data**	**Reporting Limit**	**No. of Samples**
Arsenic	µg/L	7	1	1
Aluminum	µg/L	<50	50	1
Cadmium	µg/L	<5	5	1
Copper	µg/L	<5	5	1
Iron	µg/L	<50	50	1
Lead	µg/L	<2	2	1
Manganese	µg/L	<50	50	1
Mercury	µg/L	<0.006	0.006	1
Nickel	µg/L	<5	5	1
Uranium	µg/L	<5	5	1
Zinc	µg/L	19	5	1
Nitrogen, Ammonia as N	mg/L	1.72	0.05	1
Gross alpha	pCi/L	97.9	1	1
Gross beta	pCi/L	120	2	1
Total Gross alpha and beta	pCi/L	217.9	-	-
Dissolved Oxygen	mg/L	0.45	0.10	1
COD	mg/L	42	3.0	1
Hardness	mg/L	1010	10	1

Table 6 – Toxic Pollutants Screening Data for Outfall 002 (Sampling Date: 10/25/07)

Parameter	**Units**	**Data**	**Reporting Limit**	**No. of Samples**
Arsenic	µg/L	<1	1	1
Aluminum	µg/L	<50	50	1
Cadmium	µg/L	<5	5	1
Copper	µg/L	<5	5	1
Iron	µg/L	70	50	1
Lead	µg/L	<2	2	1
Manganese	µg/L	<50	50	1
Mercury	µg/L	<0.006	0.006	1
Nickel	µg/L	<5	5	1

Uranium	µg/L	<5	5	1
Zinc	µg/L	<5	5	1
Nitrogen, Ammonia as N	mg/L	<0.05	0.05	1
Gross alpha	pCi/L	3.1	1	1
Gross beta	pCi/L	4.7	2	1
Total Gross alpha and beta	pCi/L	7.8	-	-
Dissolved Oxygen	mg/L	7.66	0.10	1
COD	mg/L	<3.0	3.0	1
Hardness	mg/L	164	10	1

Reasonable Potential (RP) Evaluation

Quantitative RP Analysis

The NPDES regulations in 40 CFR § 122.44(d)(1)(i) – (iii) require Permit writers to assess effluent with respect to the EPA-approved water quality standards to evaluate the impact of direct dischargers on downstream water quality. This assessment is used to determine permit limitations that are protective of water quality uses. The EPA considered it appropriate to assess effluent discharged from this facility and evaluate RP with respect to tribally-approved water quality requirements. The RP for pollutants in the discharge to cause or contribute to an exceedance of applicable water quality requirements was evaluated for all parameters of concern measured and reported in the permit application, hazard screening, or DMR. The effluent data was compared to applicable acute and chronic aquatic life criteria values presented in Table 1 after consideration of pollutant variability in the discharge. A quantitative RP evaluation was performed using the Region 8 RP Tool, which assesses RP from effluent data with statistical procedures consistent with EPA's Technical Support Document for Water Quality Based Toxics Control, March 1991. A confidence interval of 95% was used for all RP calculations. See results in Table 7 below.

Table 7 – Reasonable Potential Evaluation (metals, anions, etc.)

Parameter	**Aquatic Life Water Quality Criteria**		**Maximum Reported Effluent Concentration**	**Reasonable Potential?**	
	Acute	**Chronic**		**Acute**	**Chronic**
Chloride, mg/L	860	230	970	Yes	Yes
Fluoride, mg/L	2 (2)	N/A	3.7	Maybe (3)	N/A
Oil & Grease, mg/L	N/A	10	7.9	No	No
Sulfate, mg/L	1,800 (2)	1,000 (2)	2010	Yes	Yes
Sulfide (as H_2S), mg/L	-	0.002	122	-	Yes
Aluminum, µg/L	750	87	<50	No	No
Arsenic, µg/L	340	150	7	No	No
Cadmium, µg/L	7.7 (1)	0.6 (1)	<5	No	Maybe (4)
Chromium (III), µg/L	1,773	231	0	No	No
Copper, µg/L	49.6 (1)	29.3 (1)	<5	No	No
Iron, µg/L	N/A	1,000	<50	-	No
Lead, µg/L	280.9 (1)	10.9 (1)	<2	No	No
Mercury, µg/L	1.40	0.77	<0.006	No	No
Nickel, µg/L	1,513(1)	168 (1)	<5	No	No
Selenium, µg/L	N/A	5.0	13	N/A	Yes
Silver, µg/L	34.9(1)	N/A	ND	No	No
Zinc, µg/L	379(1)	382 (1)	19	No	No

(1) Calculated based on hardness value of 400 mg/L.

(2) Criteria limit is not an aquatic life water quality limit, but rather a recommended limit for

livestock and wildlife propagation.

(3) The permit application data provided by the permittee included one sample result for fluoride. That sample result is higher than the acute fluoride criteria, but the EPA is unable to determine whether the result is significant and thus represents actual effluent quality due to variability of this pollutant. Additional data is necessary.

(4) Sampling conducted in the previous permit cycle relied on a method with a detection limit for cadmium of 5 µg/L, which is above the chronic cadmium criterion of 0.6 µg/L. As a result, a quantitative RP analysis could not be completed for this criterion. For this Permit, a lower cadmium detection limit of 0.1 µg/L is required.

The results of the quantitative evaluation identified sulfide (as H_2S), chloride, sulfate, and selenium as having RP to cause or contribute to exceedances of the water quality criteria. As a result, the EPA is including a water quality based effluent limit for sulfide (as H_2S), chloride, sulfate, and selenium.

Section 122.44(d)(1)(ii) of the EPA's NPDES regulations require that the Agency account for the variability of a pollutant in the effluent when determining whether that particular pollutant has RP to cause or contribute to an exceedance of a water quality criterion. To confidently evaluate quantitatively the RP of a pollutant, however, a sufficient quantity of data of known quality to assess variability must be available. For fluoride and cadmium insufficient quantitative data is available to adequately assess RP to exceed their numeric criteria. As a result, the EPA is not including a water quality based effluent limit for either pollutant, but is instead requiring additional monitoring. This monitoring will allow the EPA to effectively characterize the nature of the pollutants in the discharge and confidently determine whether either pollutant has RP to cause or contribute to an exceedance of their respective water quality criteria.

Qualitative RP Analysis

In addition to quantitative RP analyses, the EPA also considers other qualitative information to help in its determination whether a pollutant has reasonable potential to cause or contribute to an exceedance of a water quality criterion. This qualitative RP analysis allows the EPA to assess the potential for uncertainty in effluent concentrations and consider other data or factors that may point toward actual concentrations of pollutants in the discharge. In cases where there are only one or two data points available, this qualitative analysis can inform the Agency's decision to establish effluent limits or impose monitoring requirements. The qualitative RP analyses for sulfide, fluoride, cadmium, mercury, and organic compounds are described below.

Sulfide (as H_2S)

Sulfide (as H_2S) can be toxic to aquatic life. The sulfide as H_2S limitation of 200 mg/L for 30 day average is based on the desired level of water quality for the receiving water as indicated by the clarifications in the letters provided by the Eastern Shoshone Tribe on January 26, 2016 and Northern Arapaho Tribe on January 25, 2016. The Tribes clarified their interpretation of the "zone of passage requirement" for chronic criteria, indicating that the limitation on water quality mixing zones for chronic criteria is not intended to apply to effluent dominated streams such as the discharge from Mission Creek to Wyoming Canal. As a result, the EPA has finalized a sulfide as H_2S effluent limitation that is based on a zone of non-attainment (mixing zone) that allows for the natural dissipation of hydrogen sulfide from the produced water. The extent of the zone is for a maximum length of approximately four miles from Lower Mission pond to Wyoming Canal. The Wyoming Canal location is the first non-effluent

dominated stream downstream from the discharge and therefore the four miles mixing zone accords with the Tribes' interpretation of their zone of passage requirements for chronic criteria.

Fluoride and Cadmium

As noted above, the data provided for these pollutants is insufficient to confidently determine the potential for this pollutant to impact the receiving streams in which the facility discharges. The EPA has no other information to allow it to assess the potential variability of these pollutants in the effluent. Thus, effluent limitations will not be established for fluoride and cadmium at this time. Instead, monitoring will be required using sufficiently sensitive analytical methods to collect adequate data to quantitatively assess RP during the next permit renewal.

Mercury

Although the mercury level did not exceed the aquatic life water quality criterion, the metal was detected in at least one sample and therefore, additional monitoring using clean methods are required to compile a more complete data set for future evaluation. Also, the reissued permit includes a trigger level established at the chronic water quality criteria of 0.77 µg/L and a requirement to develop and implement a mercury minimization plan if that trigger level is detected.

Organic Compounds

The permit application data submitted included one analysis of some volatile and semi-volatile organic compounds based on whether the Permittee believed that the analyte was present in the discharge. The data presented in Table 4 indicates the effluent contains measurable concentrations of benzene, ethyl benzene, and toluene.

The data was evaluated with respect to EPA and Tribal water quality criteria for human health protection and the EPA Maximum Contaminant Levels (MCL) for drinking water to determine if there was RP for pollutants in the discharge to exceed the criteria in Table 8 below. There were no parameters identified at concentrations which exceeded the recommended criteria for human health protection and the MCL. Since the Tribes have not designated the receiving water as a drinking water source, the human health criteria and MCLs are not directly applicable to the water body and effluent limitations will not be established based on this evaluation.

Table 8 - Effluent Organic Compounds Detected and Water Quality Criteria Comparison

Parameter	Effluent Concentration (µg/L)	Water Quality Criteria (Human Health (µg/L) Water+Organism	Water Quality Criteria (Human Health (µg/L) Organism only	Drinking Water MCL (µg/L)
Benzene	0.34	2.1	58	5
Ethyl Benzene	0.13	68	130	700
Toluene	0.54	57	520	1,000

Although no effluent limitations were established for these volatile and semi-volatile organic compounds in the Permit, the effort required to reduce the concentration of other pollutants (e.g. sulfide (as H_2S)) in the discharge will concurrently reduce the concentration of volatile organic compounds in the discharge. Additional monitoring for volatile and semi-volatile organic compounds will, however, be required as part of the toxic pollutants screening monitoring requirements in this renewal Permit.

Other Effluent Limitations

The daily maximum limitations for Total Radium 226 of 60 pCi/L, Specific conductance of 7,500 µS/cm and total dissolved solids of 5000 mg/L have been retained in this renewal Permit and are based on previous permit limitations.

pH limitations have been revised from a range of 6.5 - 8.5 to a range of 6.5 - 9.0 based on tribal requirements for aquatic life protection. The basis for the previous maximum range value for pH of 8.5 could not be verified from review of the permit record and therefore the limit has been revised for this renewal Permit.

The Permittee requests removal of the acrylamide monomer and total chromium limits and monitoring requirements for the reissuance of this Permit in the permit application. They pointed out that the review of monitoring data shows there were no detectable amounts of acrylamide monomer or total chromium. The EPA reviewed the DMR data in Table 2 for acrylamide and monomer and total chromium and concurred with the Permittee's evaluation. The EPA is not including the acrylamide monomer and total chromium limits and monitoring requirements for this Permit. This meets one of the antibacksliding requirement as outlined in the CWA section 402(o)(2), specific exceptions of "New information (other than revised regulations, guidance, or test methods) is available that was not available at the time of permit issuance and that would have justified a less stringent effluent limitation. If the effluent limitation was based on water quality standards, any changes must result in a decrease in pollutants discharged."

Effluent Limitations

Based on the technology and water quality considerations and protecting beneficial uses, the following effluent limitations will be required for this facility:

Effluent Limitations - Outfalls 001 and 002.

Effluent Characteristic	**Effluent Limitation**		**Basis for Limitation b/**
	30-Day Average a/	**Daily Maximum a/**	
Flow, Total (Combined flow from Outfall 001 and Outfall 002), mgd	2.5	3.0	ELPP

Effluent Limitations - Outfall 001.

Effluent Characteristic	**Effluent Limitation**		**Basis for Limitation b/**
	30-Day Average a/	**Daily Maximum a/**	

Specific Conductance, µS/cm	N/A	7,500	ELPP
Total Dissolved Solids, mg/L	N/A	5,000	ELPP
Chloride, mg/L	N/A	2,000	WQR
Sulfate, mg/L	N/A	2,500	RCLW
Sulfide (as H_2S), mg/L	200	N/A	WQR
Selenium, µg/L	5.0	N/A	WQR
Total Radium 226, pCi/L	N/A	60	ELPP
The concentration of oil and grease shall not exceed 10 mg/L in any sample nor shall there be a visible sheen or cause a visible sheen in the receiving waters or deposits on the bottom or shoreline of the receiving waters.			ELPP , WQR
The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.			WQR
There shall be no discharge of floating solids or visible foam in other than trace amounts			ELPP, WQR

a/ See Permit Part 1.1. for definition of terms.

b/ ELPP = Effluent limitations in previous permit; WQR = water quality requirements adopted by the Tribes for the Wind River Indian Reservation; RCLW = Recommended criteria for livestock and wildlife, based on the report "Water Quality for Wyoming Livestock & Wildlife, A Review of the Literature Pertaining to Health Effects of Inorganic Contaminants", University of Wyoming department of Veterinary Sciences, et al.

Effluent Limitations - Outfall 002.

Effluent Characteristic	**Effluent Limitation**		**Basis for Limitation b/**
	30-Day Average a/	**Daily Maximum a/**	
Specific Conductance, µS/cm	N/A	7,500	ELPP
The concentration of oil and grease shall not exceed 10 mg/L in any sample nor shall there be a visible sheen or cause a visible sheen in the receiving waters or deposits on the bottom or shoreline of the receiving waters.			ELPP , WQR
The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.			WQR
There shall be no discharge of floating solids or visible foam in other than trace amounts			ELPP, WQR

a/ See Permit Part 1.1. for definition of terms.

b/ ELPP = Effluent limitations in previous permit; WQR = water quality requirements adopted by the Tribes for the Wind River Indian Reservation; RCLW = Recommended criteria for livestock and wildlife, based on the report "Water Quality for Wyoming Livestock & Wildlife, A Review of the Literature Pertaining to Health Effects of Inorganic Contaminants", University of Wyoming department of Veterinary Sciences, et al.

Self-Monitoring Requirements

Sampling and test procedures for pollutants listed in this part shall be in accordance with guidelines promulgated by the Administrator in 40 CFR Part 136, as required in 40 CFR § 122.41(j). At a minimum, the following constituents shall be monitored at the frequency and with the type of measurement indicated; samples or measurements shall be representative of the volume and nature of the monitored discharge. If no discharge occurs during the entire monitoring period, it shall be stated on the Discharge Monitoring Report Form that no discharge or overflow occurred.

Self-monitoring requirements – Outfall 001 and Outfall 002

	Sampling Frequency		
Parameter	**Outfall 001**	**Outfall 002**	**Sample/Monitoring Type a/**
Total Flow, MGD b/	Monthly	Monthly	Instantaneous
Specific Conductance, µS/cm	Monthly	Monthly	Grab
pH, std units	Monthly	Monthly	Grab
Oil and Grease, mg/L c/	Weekly	Weekly	Visual
Sulfide (as H_2S), mg/L d/	Quarterly	N/A	Grab
Chloride, mg/L	Quarterly	N/A	Grab
Sulfate, mg/L	Quarterly	N/A	Grab
Selenium, µg/L	Quarterly	N/A	Grab
Total Radium 226, pCi/L	Quarterly	N/A	Grab
Total Dissolved Solids, mg/L	Semi-Annually	N/A	Grab
Fluoride, mg/L	Semi-Annually	N/A	Grab
Cadmium, µg/L	Semi-Annually	N/A	Grab
Mercury, Total, µg/L e/	Three times after effective date of permit	N/A	Grab
Whole Effluent Toxicity, Acute (see Part 1.3.5.)	At least four times after the effective date of permit f/	N/A	Grab
Toxic Pollutants Screen (see Part 1.3.3.)	Up to three times after effective date of permit	N/A	Grab

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

b/ Flow measurements of effluent volume shall be made in such a manner that the Permittee can affirmatively demonstrate that representative values are being obtained. The average flow rate (in million gallons per day) during the reporting period and the maximum flow rate observed (in mgd) shall be reported.

c/ A weekly visual observation is required. If a visible sheen is detected, a grab sample shall be taken immediately and analyzed in accordance with the requirements of 40 CFR Part 136. The concentration of oil and grease shall not exceed 10 mg/L in any sample.

d/ The analysis for sulfide (as H_2S) shall be done with an approved procedure that has a method detection level of no greater than 0.10 mg/L (100 µg/L). In the calculation of average sulfide (as H_2S)

concentrations, those analytical results that are less than 0.10 mg/L shall be considered to be zero. If all individual analytical results that would be used in the calculations are less than 0.10 mg/L, then "less than 0.10 mg/L" shall be reported on the discharge monitoring report form. Otherwise, report the maximum value and the calculated average value.

e/ Monitoring periods shall be during the 1st , 3rd and 5th years after the effective date of this Permit. Based on current approved analytical mercury method, Method 1631, Revision E, the method detection limit (MDL) for mercury is 0.0002 µg/L. If the mercury trigger level of 0.77 µg/L is exceeded during the life of the Permit, the Permittee is required to develop and implement the Mercury Minimization Plan (MMP), as described in Part 1.3.7.

f/ Tests shall be coordinated with the Toxic Pollutants Screen to ensure more even coverage as described in Part 1.3.5. of the Permit. To the extent practicable, tests shall be timed to provide results that represent seasonal variation in the discharge.

Additional Toxics Monitoring Requirements

Toxic Pollutants Screen.

This Permit requires the Permittee to monitor for the constituents listed below in the toxic pollutants screen up to three times during the life of the Permit. One monitoring event will be during the first year after the effective date of this Permit, and the second monitoring event during the third year after the effective date of this Permit. A third monitoring event will be required only if the Permittee undertakes a hydraulic fracturing job for a well that sends produced water to this facility. In that instance, the Permittee must complete a third toxic pollutants screen within one week of returning the hydraulically fractured well to production. Each of the toxic pollutants screen datasets shall be submitted to the permit issuing authority at the time of the DMR submittal for that reporting period in which the screening results were obtained. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this Permit.

Pollutants to Be Screened:

- All Volatile Organic Compounds listed in 40 CFR Part 122, Appendix D, Table II.
- All Base/Neutral and Acid Organic Compounds listed in 40 CFR Part 122, Appendix D, Table II
- All metals listed in 40 CFR Part 122, Appendix D, Table III, except mercury which is included in the regular self-monitoring (Part 1.3.2.).
- Fluoride as listed in 40 CFR Part 122, Appendix D, Table IV

The Toxic Pollutants Screen provision provides greater coordination between toxicity monitoring requirements that is being established. The Permittee is required to coordinate its whole effluent toxicity (WET) monitoring and the Toxic Pollutants Screen to ensure even coverage over the permit term. In doing so, the two monitoring provisions will ensure that the EPA has regular monitoring data about potential toxicants and toxic effects present in the discharge across time. Two Toxic Pollutants Screens required during the first and third year of the permit term will identify a wide variety of potentially toxic parameters that may be present in the normal discharge. In addition, if the Permittee undertakes a hydraulic fracturing event at a well which sends produced water to the treatment facility, the Permittee must complete a third toxic pollutant screen within one week of returning the hydraulically fractured well

to production. This third Toxic Pollutants Screen will ensure that the EPA and the Permittee have data on potential toxicants or toxic effects that may be attributable to hydraulic fracturing.

Whole Effluent Toxicity (WET) (Permit Part 1.3.5.)

The following WET requirements are based on the Tribe's expressed interpretation of their water quality requirements for effluent dominated streams on this reservation. The Permittee will coordinate WET testing and its Toxic Pollutant Screens to assess the toxicity of the produced water that discharges to these streams. At least four times after the effective date of the Permit, the Permittee shall conduct acute static-renewal toxicity tests on a grab sample of the produced water discharge from Outfall 001. These tests shall be coordinated with the Toxic Pollutants Screen required in Section 1.3.3. of this Permit to ensure that the acute static-renewal toxicity tests are staggered with the Toxic Pollutants Screens to ensure a more even coverage during the permit term. To the extent practicable, the static-renewal toxicity tests should also be timed to provide results that represent seasonal variation in the discharge. Samples must be chilled to 0ºC to 6ºC.

The static-renewal toxicity tests shall be conducted in accordance with the procedures set out in the latest revision of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms", EPA-821/R-02-012 (October 2002). Acute WET test shall be performed on two species; *Daphnia magna*, EPA 2021.0, as a 48-hr, static-renewal definitive test with renewals at each 24-hr interval, and *Pimephales promelas*, EPA 2002.0, as a 96-hour static-renewal definitive test with renewals at each 24-hr interval. Both test shall utilize the standard dilution series of 100%, 75%, 50%, 25%, 12.5% and a 0 control, with moderately hard synthetic laboratory water for dilutions with test temperature set at 25°C.

The Permittee or a laboratory performing the toxicity tests on behalf of the Permittee is allowed to utilize the sample preparation procedure described in Section 9.1.7 of the Acute Method to remove sulfide (as H_2S) from the discharge sample. This procedure may only be performed in the laboratory testing facility. The dissolved oxygen (DO) concentration in the samples should be near saturation prior to laboratory analysis. Aeration may be used to bring the DO and other gases into equilibrium with air, minimize oxygen demand, and stabilize the pH.

Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration. If more than 10 percent control mortality occurs, the test is not valid. The test shall be repeated until satisfactory control survival is achieved.

Regular acute toxicity test results shall be reported on the Discharge Monitoring Report (DMR) submitted for the reporting period when the acute toxicity monitoring was conducted. A laboratory reporting form consistent with the "Suggested R8 WET Toxicity Test Report Form", including all chemical and physical data as specified shall also be submitted to the permit issuing authority as an attachment to the DMR. Copies of the format may be downloaded from the Region 8 web page at https://www.epa.gov/sites/production/files/2016-01/wet-laboratory-reporting-forms.xlsm.

If acute toxicity occurs in a test, the Permittee shall do the following:

(1) Notify the Permit issuing authority within 48 hours of when the Permittee learned of the initial test failure;

(2) Promptly take all reasonable measures necessary to immediately reduce toxicity; and

(3) Initiate an additional test within two (2) weeks of the date of when the Permittee learned of the test failure. If only one species fails, retesting may be limited to this species.

The Permit issuing authority may waive either or both requirements (2) or (3) with justification (e.g., the toxicity has been ongoing and the Permittee is in the process of conducting a toxicity identification evaluation/toxicity reduction evaluation as required in Part 1.3.6. of this Permit).

Should acute toxicity occur in the second test, the Permittee shall immediately begin testing once a month until further notified by the Permit issuing authority. Accelerated monthly testing is only required for the species that failed the initial and second tests.

In addition to the accelerated monitoring, the Permittee shall perform a toxicity identification evaluation/toxicity reduction evaluation as required by Part 1.3.6 of this Permit to establish the cause of the toxicity, locate the source(s) of the toxicity, and develop control of, or treatment for the toxicity.

Test results from additional toxicity testing conducted (i.e. two week retest, monthly testing and TIE/TRE testing) shall be reported by the 28th of the month following the test to the following address:

Wastewater Unit (8WP-CWW)
Attn: Regional WET Coordinator
U.S. EPA, Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

Method Detection Limits (Permit Part 1.3.4.)

Monitoring methods must be sufficiently sensitive to meet the Method Detection Limits specified in Table 10 below:

Table 10 - Required Method Detection Limits

Parameter	Required Detection Limits and Required Units
Arsenic, Total	1 µg/L
Aluminum, Total Recoverable	50 µg/L
Antimony, Total Recoverable	50 µg/L
Beryllium, Total Recoverable	1 µg/L
Cadmium, Total Recoverable	0.1 µg/L
Chromium, Total Recoverable	5 µg/L

Chloride	5 mg/L
Copper, Total Recoverable	5 µg/L
Lead, Total Recoverable	1 µg/L
Magnesium, Total Recoverable	30 µg/L
Manganese, Total Recoverable	2 µg/L
Nickel, Total Recoverable	1 µg/L
Radium 226, Total Recoverable	0.2 pCi/L
Selenium, Total Recoverable	2 µg/L
Silver, Total Recoverable	5 µg/L
Sulfide/Hydrogen Sulfide (S=, HS-)	100 µg/L
Thallium, Total Recoverable	50 µg/L
Zinc, Total Recoverable	2 µg/L
Hardness, Total	10 mg/L as CaCO3
Uranium, Total Recoverable	5 µg/L
Gross Alpha and Beta Radiation	0.2 pCi/L
Dissolved Oxygen	1 mg/L
Calcium	10 mg/L
Fluoride	1 mg/L
Volatile Organic Compounds	5 µg/L
Acid & Base/Neutral Organic Compounds	10 µg/L
Chemical Oxygen Demand	3 mg/L

Mercury Minimization Plan (MMP) (Permit Part 1.3.7.)

CWA Section 301(a) prohibits the discharge of any pollutant, including mercury, from a point source into waters of the United States except in compliance with Section 402 of the CWA. CWA Section 402 establishes the NPDES program, under which the EPA are authorized to administer the program issue permits that allow the discharge of pollutants into waters of the United States. These permits must contain (1) technology-based effluent limitations, which represent the degree of control that can be achieved by point sources using various levels of pollution control technology and (2) water quality-based effluent limitations (WQBELs), when necessary to ensure that the receiving waters achieve applicable water quality requirements.

Most WQBELs are expressed as numeric limits on the amounts of specified pollutants that may be discharged. However, WQBELs may also be expressed in narrative form such as Best Management Practices (BMPs) or pollutant minimization measures when it is infeasible to calculate a numeric limit (40 CFR § 122.44(k)(3)). In addition, BMPs may be imposed in the form of NPDES permit conditions to supplement numeric effluent limitations when the permit issuing authority determines that such requirements are necessary to carry out the purposes and intent of the CWA (40 CFR § 122.44(k)(4)).

On January 8, 2001, the EPA announced the availability of its recommended CWA Section 304(a) water quality criterion for methylmercury. This water quality criterion, 0.3 milligram (mg) methylmercury per kilogram (kg) fish tissue wet weight, describes the concentration of methylmercury in freshwater and estuarine fish and shellfish tissue that should not be exceeded. The EPA recommended that the criterion be used as guidance by states, territories, and authorized tribes in establishing or updating water quality standards for waters of the United States. The EPA completed the Guidance for implementing the January 2001 Methylmercury Water Quality Criterion in April 2010.[3]

According to the Methylmercury Guidance, where a water column translation is not available and the Permit writer determines that a numeric limit is infeasible to calculate, the Permit writer should include the following permit conditions:

1. The reissued permit will include a trigger level established at the chronic water quality criteria of 0.77 µg/L and a requirement to develop and implement a Mercury Minimization Plan (MMP) if that trigger level is detected;
2. Require the Permittee to implement a MMP tailored to the facility's potential to discharge mercury. This MMP may be used as a trigger level, reduction goal or used to supplement an enforceable numeric limit to further manage mercury discharges;
3. Require effluent monitoring using a sufficiently sensitive EPA-approved method to determine if the MMP is effective. (EPA Clean Sampling Method 1669 and Analytical Method 1631); and
4. Include a reopener clause to modify the permit conditions if the MMP is not found to be effective or if a water column of the fish tissue criterion is developed.

The Permittee is required in the reissued permit to develop an MMP tailored to the facility's potential to discharge mercury if the trigger level is detected. At a minimum, the MMP shall include the following:

- Evaluation of existing best management plans or spill prevention and containment control plans;
- Identification and evaluation of current and potential mercury sources;
- Monitoring to confirm current or potential mercury sources;
- Identification of potential methods for reducing or eliminating mercury, including material substitution, material recovery, spill control and collection, waste recycling, process modifications, good housekeeping and disposal practices;
- Implementation of appropriate minimization measures identified in the MMP; and
- Effluent monitoring using sufficiently sensitive analytical methods to verify the effectiveness of the MMP.

Chemical Inventory Reporting Requirement (Permit Part 1.3.8)

The Permittee shall maintain an inventory of the quantities and concentrations of the specific chemicals used to formulate well treatment and workover fluids. Unless these fluids are segregated, the Permittee shall submit the following information with the DMR, to the extent such information is obtainable after

3 United States Environmental Protection Agency, Office of Science and Technology (April 2010): Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion – Final, http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/pollutants/methylmercury/upload/mercury2010.pdf

making reasonable inquiries to suppliers: all chemical additives in the well treatment or workover fluid, their trade names, purposes, supplier, CAS number, concentrations and amounts. The type of operation that generated the well treatment or well workover fluids shall also be reported. To the extent a Safety Data Sheet (SDS) contains the information required above, it may be submitted for purposes of complying with this provision. For purposes of this provision, well treatment and workover fluids will be considered segregated if the Permittee takes steps to recover a volume of fluid equivalent to the volume of the well treatment or workover fluid used in the job.

> "Well treatment fluids" means any fluid used to restore or improve productivity by chemically or physically altering hydrocarbon-bearing strata after a well has been drilled.
>
> "Well workover fluids" means salt solutions, weighted brines, polymers, or other specialty additives used in a producing well to allow for maintenance, repair or abandonment procedures."

The Chemical Inventory Reporting Requirement provides actual practices for well treatment and workover that occur at the facility. The facility can segregate fluids used in well treatment and workover. This Permit requires reporting of the chemical quantities, etc. used in well treatment and workover only when those fluids are not segregated and are actually discharged with the produced water.

Reporting of Monitoring Results: With the effective date of this Permit, the Permittee must electronically report all monitoring data into the discharge monitoring reports (DMR) on a quarterly frequency using NetDMR. Electronic submissions by the Permittee must be sent to EPA Region 8 no later than the 28th of the month following the completed reporting period. The Permittee must sign and certify all electronic submissions in accordance with the signatory requirements of the Permit. NetDMR is accessed from the internet at https://netdmr.zendesk.com/home.

In addition, the Permittee must submit a copy of the DMR to the Northern Arapahoe and Eastern Shoshone Tribes. Currently, the Permittee may submit a copy to the Tribes by one of three ways: 1. a paper copy may be mailed. 2. the email addresses for Northern Arapahoe and Eastern Shoshone Tribes may be added to the electronic submittal through NetDMR, or 3. the Permittee may provide the Tribes viewing rights through NetDMR.

The DMRs are due quarterly and are due by the dates listed below and shall not be submitted until the reporting period is complete.

Compliance Monitoring Period	Due Date
January through March	April 28
April through June	July 28
July through September	October 28
October through December	January 28

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.

The U. S. Fish and Wildlife (USFWS) Information for Planning and Conservation (IPaC) website program was utilized to determine Federally-Listed Endangered, Threatened, Proposed and Candidate Species. The federally listed threatened and endangered species found in Fremont County, Wyoming include:

Species/Critical Habitat	**Scientific Name**	**Status**	**Informal Consultation Determination (6/5/2018)**
Canada Lynx	*Lynx canadensis*	Threatened	No effect
Grizzly Bear	*Ursus arctos horribillis*	Threatened	No effect (removed from the list of threatened and endangered species on June 22, 2017)
North American Wolverine	*Gulo luscus*	Proposed Threatened	No effect
Least Tern	*Sterna antillarum*	Endangered	May affect, but is not likely to adversely affect (Platt River Species)
Piping Plover	*Charadrius melodus*	Threatened	May affect, but is not likely to adversely affect (Platt River Species)
Whooping Crane	*Grus americana*	Endangered	May affect, but is not likely to adversely affect (Platt River Species)
Yellow-billed Cuckoo	*Coccyzus americanus*	Threatened	May affect, but is not likely to adversely affect (Right riparian area)
Bonytail Chub	*Gila elegans*	Endangered	May affect, but is not likely to adversely affect (Platt River Species)
Colorado Pikeminnow (squawfish)	*Ptychocheilus lucius*	Endangered	May affect, but is not likely to adversely affect (Platt River Species)
Humpback Chub	*Gila cypha*	Endangered	May affect, but is not likely to adversely affect (Platt River Species)
Pallid Sturgeon	*Scaphirhynchus albus*	Endangered	May affect, but is not likely to adversely affect (Platt River Species)
Razorback Sucker	*Xyrauchen texanus*	Endangered	May affect, but is not likely to adversely affect (Platt River Species)
Desert Yellowhead	*Yermo xanthocephalus*	Threatened	No effect (Sand Dune Species)
Fremont County Rockcress	*Boechera pusilla*	Candidate	No effect
Ute Ladies'-tresses	*Spiranthes diluvialis*	Threatened	May affect, but is not likely to adversely affect
Western Prairie Fringed Orchid	*Platanthera praeclara*	Threatened	May affect, but is not likely to adversely affect
Whitebark Pine	*Pinus albicaulis*	Candidate	No effect

The EPA is utilizing the information provided by the USFWS IPaC system and had an informal phone consultation with the representative at the Cheyenne, Wyoming USFWS field office on June 5, 2018 to identify a determination for each specie in the table above. The EPA also sent a letter to USFWS to seek concurrence with EPA's determination before public notice of the Permit.

Based on the informal consultation determination with the Wyoming USFWS field office representative, the EPA determined this Permit will have "no effect" or "may affect, but is not likely to adversely affect" to some species as described in the table above.

The EPA received a concurrence letter dated July 13, 2018, from the USFWS Wyoming field office on this determination.

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 Steamboat Butte Fields 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. The EPA will notify the Tribal Historic Preservation Officer (THPO) of the planned issuance of this NPDES Permit and request their input on potential effects on historic properties and EPA's preliminary determination in this regard during the public comment period.

Miscellaneous

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

Permit and Statement of Basis drafted by:
Qian Zhang P.E., EPA Region 8, 8WP-CWW, 303-312-6267
December 11, 2017

Permit and Statement of Basis reviewed by:
Wastewater staff (8WP-CWW) and ORC Attorney (8RC)
July 3, 2018