

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Water Quality Division

MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM

Permit Fact Sheet

Permittee: Westmoreland Rosebud Mining, LLC

Permit No.: MT0032042

Receiving Waters: Lee Coulee, Fossil Fork of Lee Coulee, unnamed tributaries to Fossil Fork, unnamed tributaries to Richard Coulee

Facility Information
Name: Rosebud Mine – Mine Area B AM5
Contact: Wade Steere, P.E. Environmental Engineer

County: Rosebud

Fee Information
Type: Privately Owned Treatment Works – Minor (SIC 1221)
Number of Outfalls: 4 (for fee determination only) potential grouping
Group A: Outfalls 001 through 002
Group B: Outfalls 003 through 007
Group C: Outfalls 008 through 010
Group D: Outfalls 011 through 018

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1 BACKGROUND

This fact sheet identifies the principal facts, and significant factual, legal, methodological, and policy issues to support the requirements found in the Permit.

1.1 Permit and Application Information

The Permit is issued upon application for a new Montana Pollutant Discharge Elimination System (MPDES) and is assigned permit number MT0032042. DEQ received the initial application on May 11, 2018 and issued a notice of deficiency (NOD) on February 24, 2020. The Permittee responded to the NOD on March 11, 2020. DEQ issued a second NOD on April 15, 2020. The Permittee responded to the second NOD on April 24, 2020. DEQ issued a third NOD on May 5, 2020. The Permittee responded to the third NOD on May 6, 2020. DEQ determine the application was complete on June 1, 2020. The Permittee submitted updated application information on September 23, 2021 and October 14, 2021.

1.2 Description of Facility, Discharge Points, and Mixing Zones

1.2.1 Description and Location of Facility

Westmoreland Rosebud Mining LLC (hereinafter “Permittee”) is the owner and operator of proposed surface coal mine known as Rosebud Coal Mine Area B AM5 (hereinafter “Facility”). The Facility is not yet constructed. All references to the Facility operations and location in this fact sheet are to the proposed Facility and location as described in the MPDES permit application.

The Permittee proposes coal mining south of Rosebud Mine Area B through amendment, AM5, of surface mining permit (SMP) C1984003B. The Facility includes surface disturbance predominately in the Lee Coulee drainage with a small amount of disturbance in the Richard Coulee drainage. The Facility increases the Area B permit area to 15,153 acres with 8,194 acres of surface disturbance, 2,658 acres of the disturbance are projected to be related to the Facility. Of the total disturbance area, 5,478 acres would be disturbed for mining (coal extraction), the remainder would be disturbed by highwall reduction, soil storage, scoria pits, haul-road construction, and other activities related to mining and reclamation sequence activities. The southeast area of the Facility includes 500 acres of the former Big Sky Mine Area B, SMP C1988004B. A portion of the reclaimed Big Sky Mine area is within the proposed disturbance area which includes sediment ponds and topsoil stockpiles. See Appendix A, Figure A-1 for a facility site map.

The Facility includes an estimated 42.9 million tons of recoverable coal reserves, which increases the expected mining operational lifespan of the Rosebud Mine by 4 additional years. Geologic stratigraphy (sequence of rock and mineral layers) underlying the Facility includes sandstone and shale members above a series of coal, shale, and siltstone layers comprising the Tongue River Member of the Fort Union Formation. The Permittee will mine the Rosebud coal seam, which averages 22.6 feet thick. Average minable quality of coal from the Rosebud seam is defined in the Rosebud Mine Area B AM5 Final Environmental Impact Statement (EIS) as 8,378 BTU (British thermal units per pound), 0.91% sulfur, 25.44% moisture, 28.95% volatility, 10.41% ash content, and 35.10% fixed carbon. *See* Final Environmental Impact Statement, Rosebud Mine Area B AM5, Colstrip, Montana. Department of Environmental Quality. May 2022 (herein “DEQ 2022a” at section 2.4.3). Coal from this operation (as

typical of sub-bituminous low sulfur coal) will be crushed and resized; this process does not utilize a thickener or clarifier, which would be associated with a slurry or settling impoundment. (DEQ 2022a)

Coal sourced from the Facility will be used exclusively for electrical power generation in the Colstrip Power Plant (units 3 and 4 total 1480 megawatts generating capacity), and the Rosebud Power Plant (24 megawatt generating capacity).

The mining process at the Facility consists of the following six steps from initial surface disturbance through reclamation: 1) topsoil removal; 2) overburden blasting and removal; 3) coal mining; 4) overburden blasting is used to fill the pit; 5) grading; and 6) topsoil replacement. During the first step topsoil and subsoil are stripped and separately stockpiled for use in site reclamation. Next, overburden, the material between soil and the coal seam, is then blasted and removed to expose the coal seam for extraction. The overburden is used to fill an adjacent pit, then base-graded to approved post-mine topography, ripped to relieve compaction, and prepared for soil cover. The subsoil and topsoil materials placed according to the surface mining permit requirements and revegetated to meet reclamation requirements in bond release phasing.

1.2.2 Wastewater Treatment or Controls

Mine drainage is defined in the *Effluent Limitations Guidelines for the Coal Mining Point Source Category* codified at 40 CFR 434.11(h) as “any drainage, or any water pumped or siphoned, from an active mining area, which includes groundwater infiltration into the pit, storm water which collects in the pit or post-mining area.” Mine drainage at the facility is routed through sediment traps and ponds allowing sediment to settle, reducing sediment and other pollutant loading of receiving waters. Each point where discharge leaves the facility is an identified outfall.

Each outfall is associated with a sediment pond designed to contain (at a minimum) the capacity of a 10-year, 24-hour precipitation event (2.4 inches, NOAA Atlas 2, Vol. 1. 1973). The Montana Strip and Underground Mine Reclamation Act (MSUMRA) requires that sediment ponds must provide the detention time and capacity of a 10-year, 24-hour precipitation event. MSUMRA also requires maintenance of sediment volumes to a level less than 60% of the design sediment capacity. Planned discharge may occur at an outfall for maintenance required by SMP C1984003B, such as accumulated sediment removal. Discharges may also occur as a result of precipitation and or snowmelt-based runoff, which can be seasonal and variable with respect to intensity, duration, frequency, and volume. See Appendix B for a line drawing of water handling at the Facility.

1.2.3 Discharge Points and Receiving Waters

The Facility will discharge wastewater to the following state surface waters: Lee Coulee, Fossil Fork of Lee Coulee, unnamed tributaries to Fossil Fork, and unnamed tributaries to Richard Coulee. All receiving waters are within the Rosebud Creek drainage (HUC 10100003) and are received by the Yellowstone River near river mile 224 approximately 12 miles downstream of Forsyth MT.

The receiving waters at the points of discharge from the Facility are hydrologically ephemeral. An ephemeral stream is a stream or part of a stream which flows only in direct response to precipitation in the immediate watershed, or in response to the melting of a cover of snow and ice and whose channel bottom is always above the local water table. [ARM 17.30.602(10)] The hydrologic condition of the

receiving waters is described in the Cumulative Hydrological Impact Analysis (CHIA) prepared by DEQ as part of the written findings for the AM5 amendment to SMP C1984003B, Rosebud Mine Area B AM5. *See* Westmoreland Rosebud Mining, LLC, Rosebud Mine Area B AM5 Cumulative Hydrologic Impact Assessment. Department of Environmental Quality. May 2022 (herein “DEQ 2022b” at sections 2.1, 7.1.5, and 9.6.5. The CHIA includes an analysis of probable cumulative impacts to the hydrologic balance, including both surface and groundwater systems, from the proposed operation of the Facility and all previous, existing, and anticipated mining within the cumulative impact area. The hydrologic condition of the receiving waters is also described in the Rosebud Area B AM5 EIS. (DEQ 2022a at section 3.5.1.1)

The Army Corps of Engineers and the EPA found no jurisdictional navigable waters or water of the U.S. and no jurisdictional wetlands within the proposed mine expansion boundary. See Appendix C for the Approved Jurisdictional Determination dated September 26, 2017.

The permitting action includes authorization of 18 MPDES-permitted outfalls in the Lee Coulee and Richard Coulee drainages to accommodate mine expansion as outlined in the Rosebud Mine Area B AM5 EIS. DEQ 2022a at section 2.6 and Appendix E. Outfalls 001 through 010 will discharge wastewater from mine pit dewatering and precipitation runoff to Lee Coulee, Fossil Fork of Lee Coulee, and tributaries to Fossil Fork. Outfalls 011 through 018 will discharge precipitation runoff from topsoil stockpiles to tributaries of Richard Coulee. Table 1 below lists the proposed outfall locations. See Appendix A, Figure A-1 for a map of the outfall locations and receiving waters.

Table 1. Description of Discharge and Monitoring Locations

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water	Drainage Area⁽¹⁾ (acres)
001	45°49'10"N	106°42'23"W	Precipitation event runoff, mine pit dewatering	Lee Coulee	2,084 ⁽²⁾
002	45°48'59"N	106°42'00"W	Precipitation event runoff, mine pit dewatering	Lee Coulee	2,175 ⁽³⁾
003	45°48'25"N	106°41'56"W	Precipitation event runoff, mine pit dewatering	Fossil Fork of Lee Coulee	927
004	45°48'23"N	106°44'53"W	Precipitation event runoff, mine pit dewatering	Fossil Fork of Lee Coulee	6
005	45°48'21"N	106°41'45"W	Precipitation event runoff, mine pit dewatering	Fossil Fork of Lee Coulee	6
006	45°48'20"N	106°41'39"W	Precipitation event runoff, mine pit dewatering	Fossil Fork of Lee Coulee	7
007	45°48'19"N	106°41'34"W	Precipitation event runoff, mine pit dewatering	Fossil Fork of Lee Coulee	3

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water	Drainage Area ⁽¹⁾ (acres)
008	45°48'7"N	106°42'42"W	Precipitation event runoff, mine pit dewatering	Unnamed tributary to Fossil Fork	13
009	45°48'1"N	106°42'42"W	Precipitation event runoff, mine pit dewatering	Unnamed tributary to Fossil Fork	2
010	45°47'57"N	106°42'42"W	Precipitation event runoff, mine pit dewatering	Unnamed tributary to Fossil Fork	8
011	45°48'37"N	106°44'12"W	Precipitation event runoff, mine drainage	Unnamed tributary to Richard Coulee	0.5
012	45°48'40"N	106°44'25"W	Precipitation event runoff, mine drainage	Unnamed tributary to Richard Coulee	3.8
013	45°48'50"N	106°44'23"W	Precipitation event runoff, mine drainage	Unnamed tributary to Richard Coulee	7
014	45°49'5"N	106°44'21"W	Precipitation event runoff, mine drainage	Unnamed tributary to Richard Coulee	8
015	45°49'13"N	106°44'34"W	Precipitation event runoff, mine drainage	Unnamed tributary to Richard Coulee	1.2
016	45°49'35"N	106°45'36"W	Precipitation event runoff, mine drainage	Unnamed tributary to Richard Coulee	1.7
017	45°49'34"N	106°45'41"W	Precipitation event runoff, mine drainage	Unnamed tributary to Richard Coulee	2.2
018	45°49'35"N	106°45'50"W	Precipitation event runoff, mine drainage	Unnamed tributary to Richard Coulee	2
Footnotes:					
(1) Drainage areas are delineated from premine topography.					
(2) Drainage area for Outfall 001 includes area from ponds Lee-1 and Lee-2, which are in series.					
(3) Drainage area for Outfall 002 includes area from ponds Lee-1, Lee-2, and Lee-3, which are in series.					

Lee Coulee “Wet Reach” and Wetland G019

As discussed in Section 1.2.1 of this Fact Sheet, the Facility encompasses a portion of and is adjacent to the former Big Sky Mine Area B, which has achieved final bond release. The approved reclamation plan for Big Sky Mine included the re-establishment of a wet reach on Lee Coulee which was part of the pre-mine topography in the drainage. The Lee Coulee “Wet Reach” is located within the former administrative boundary of the Big Sky Mine and is downstream of Outfalls 001 and 002. As discussed in section 9.6.5 of the Area B AM5 CHIA, the hydrologic condition of the “Wet Reach” is currently ephemeral. (DEQ 2022b at section 9.6.5)

Outfalls 001 and 002 discharge from sedimentation ponds which are to be designed to capture and contain the stormwater runoff of a 10-year, 24-hour event. Pond Lee-1 is associated with Outfall 001 and is sized for a drainage area of 2,084 acres. The proposed design for Lee-1 was submitted as part of the permit application package for the AM5 amendment to SMP C1984003B, has a pond capacity of 223.39 acre-feet (ac-ft), and the calculated stormwater runoff for a 10-year, 24-hour event in the drainage area is 74.18 ac-ft.

Pond Lee-3 is associated with Outfall 002 and is sized for a drainage area of 2,175 acres. The proposed design for Lee-3 was submitted as part of the notice of intent to amend SMP 1984003B, has a pond capacity of 15.31 ac-ft, and the calculated stormwater runoff for a 10-year, 24-hour event in the drainage area is 3.57 ac-ft.

See Appendix A, Figure A-2 for a map of Outfalls 001 and 002 in relation to the “Wet Reach,” wetland G019, and former Big Sky Mine Area B.

Richard Coulee Wetlands G047 and G054

The 2013-2016 Wetland and Waters Evaluation conducted by Cedar Creek Associates, Inc. for the permittee and submitted as part of the permit application package for the AM5 amendment to SMP C1984003B determined that 23 areas met the formal definition of wetland in the study area. (Cedar Creek 2016) Two wetlands in the Richard Coulee drainage are downstream of proposed outfalls: G054 is downstream of Outfalls 011 and 012; G047 is downstream of Outfalls 013 through 018.

Wetland G047 was identified in the Richard Coulee channel at pond PO-301, which is a dammed stock pond. (Cedar Creek 2016) The 2015 and 2016 Area B-Extension South Benthic Macroinvertebrate Surveys were unable to sample G047 as it was dry during sampling. (ERM 2016a, ERM 2016b)

A sustained wetland, G054, was identified in the Richard Coulee channel between spring SP-300 and surface water monitoring site SW-301. (ERM 2016) The head of the wetland is less than 1-mile downstream of Outfalls 011 and 012. The 2016 Area B-Extension South Benthic Macroinvertebrate Survey identified 26 genera of benthic macroinvertebrates in wetland G054. (ERM 2016b) See section 3.5.2.4 of the Area B AM5 EIS for a discussion of the hydrologic condition of Richard Coulee and wetland G-054. (DEQ 2022a at section 3.5.2.4)

Outfalls 011-018 are located on bluffs above Richard Coulee where there is a large topographic change over a short distance between the point of discharge and intersection with Richard Coulee. See Appendix A, Figure A-3 for a map of outfalls in relation to wetlands G047 and G054. Table 2 contains an approximation of the distance from each outfall to the downstream wetland, distance from each outfall to Richard Coulee mainstem, and approximate elevation change between each outfall and Richard Coulee mainstem.

Table 2. Approximate distances from outfalls to downstream wetlands; distance from outfalls to Richard Coulee mainstem; and change in elevation between outfall and mainstem.

Outfall	Downstream Wetland	Approximate Distance to Wetland	Approximate Distance from Outfall to Richard Coulee Mainstem	Approximate Change in Elevation Between Outfall and Richard Coulee Mainstem
011	G054	1 mile	.3 mile	200 feet
012	G054	1.3 miles	.2 mile	120 feet
013	G047	.5 mile	.5 mile	100 feet
014	G047	.5 mile	.5 mile	140 feet
015	G047	.5 mile	.5 mile	200 feet
016	G047	1 mile	.5 mile	180 feet
017	G047	1 mile	.4 mile	180 feet
018	G047	1.2 mile	.3 mile	140 feet

1.2.4 Permit Fee Determinations

Permit fees are based on the type of waste (sewage, process wastewater, storm water, noncontact cooling water, etc.) and receiving water or stream segment. An application and annual fee for multiple outfalls is not required unless the discharges are to different receiving waters or result in multiple or variable effluent limits. For fee purposes, the Facility includes four categories of outfalls (ARM 17.30.201), see Table 3 below. Application and annual fees are required for each fee group.

Table 3. Summary of Outfall Categories for Fee Purposes

Fee Group	Effluent Description	Receiving Water	Outfalls
A	Comingled treated storm water and/or pit dewatering water	Lee Coulee	001-002
B	Comingled treated storm water and/or pit dewatering water	Fossil Fork of Lee Coulee	003-007
C	Precipitation runoff and/or mine drainage	Unnamed tributaries to Fossil Fork	008-010
D	Precipitation runoff and/or mine drainage	Unnamed tributaries to Richard Coulee	011-018

1.2.5 Estimated Effluent Characteristics

This is the first MPDES permit for the Facility. The Permittee indicated that effluent characteristics are expected to be similar to effluent discharge in Rosebud Mine Areas B and C-East as the operational (mining) process, treatment technology, and underlying geology are generally consistent between the mine areas. The Permittee submitted effluent water quality data from Rosebud Mine MPDES Permit No. MT0023965 Outfalls 015, 019, 060, and 061 with EPA Form 2C Part V. Outfalls 015, 019, and 060 discharge from Rosebud Mine Area B and outfall 061 discharges from Rosebud Mine Area C-East.

The Permittee submitted water quality data for stock ponds, springs, streams, and groundwater monitoring wells in the Lee Coulee drainage to approximate the effluent quality expected in discharges from Outfalls 001 through 018. The data is from water years 2017, 2018, and 2019. See MPDES application Appendices E and G, submitted in response to EPA Form 2D Section V Parts A and B. Stock ponds approximate the effluent quality that would be discharged from sedimentation ponds, which are typical locations for precipitation-based discharges and non-precipitation-based discharges. Stock ponds collect and retain precipitation runoff, are influence by evaporation and infiltration, may be influenced by groundwater if constructed below the top of groundwater level, and are utilized by livestock and wildlife for watering. Springs, streams, and groundwater monitoring wells approximate the effluent quality that would be discharged from sedimentations ponds during non-precipitation-based discharge events as mine pits will bisect this geology and surface water drainage collecting both precipitation-based runoff and groundwater. This data was compared to effluent water quality from MPDES Permit No. MT0023965 Outfalls 015, 019, 021, 022, 026, 060, 061, and 129 and was found to be comparable.

Appendix E of the MPDES application for MT0032042 provides a summary of the sampling sites used in calculating the estimated effluent quality provided in MPDES application Appendix G. The lab reports provided with MPDES application Appendix E contained additional sampling sites not provided in the summary. DEQ evaluated the additional sites and determined that several are in the Lee Coulee drainage. The following sites were incorporated in evaluation of the estimated effluent characteristics:

- Wells: BSP9976, WO-173, WR-173, WM-214, BSM115, BMC114, WD-211, WM-213, WD-216, BRC213, BMC214, BSM215, WD-217, BRC9163, WA-215, WR-136, WR-125, WD-195, and WD-212
- Ponds: PO-305, PO-019A, PO-019, PO-013, PO-011, PO-137, PO-026, PO-046, PO-21C, and PO-304
- Streams: BPSSS, SW-55, and BRTSS

Additional effluent data from Rosebud Mine MPDES Permit No. MT0023965, Mine Areas B and C-East were incorporated into the analysis for the period of September 2016 through January 2022. The outfalls for which there was available effluent data are: 015, 019, 021, 022, 026, 060, 061, and 129.

Water quality data for the Lee Coulee drainage was analyzed for estimating effluent characteristics. Outfalls 001 through 010 discharge wastewater from within the Lee Coulee drainage to Lee Coulee and its tributaries. Outfalls 011 through 018 are located on the divide between Lee Coulee and Richard Coulee drainages and discharge to Richard Coulee. The sediment traps associated with these outfalls will capture precipitation runoff and wastewater from topsoil stockpiles sourced from the Lee Coulee drainage. The water quality data from the Lee Coulee drainage is presumed to be representative of the effluent quality discharging to Richard Coulee. See Appendix A, Figure A-3 for locations of the outfalls relative to the Richard Coulee drainage.

As a new mine, the permittee will be required to analyze and submit effluent data required for U.S. EPA Form 2C, Parts V and VI within 24 months of beginning facility operation. DEQ will evaluate the submitted data to determine if additional or modified effluent limits, monitoring requirements, or other permit conditions are needed based on the effluent data submitted.

Table 4 provides the estimated effluent characteristics based on the above discussed water quality data. See Appendix D for a summary of water quality data for select parameters.

Table 4. Estimated effluent characteristics for AM5 discharges.

Parameter	Units	Maximum Value	Minimum Value ⁽¹⁾	Average ⁽²⁾	Number of Samples
Aluminum, dissolved	µg/L	3190	2.21	118	177
Ammonia as N	mg/L	12	0.005	0.64	168
Arsenic, total recoverable	µg/L	40.2	0.2	6.9	55
Boron, total	mg/L	0.65	0.02	0.19	87
Cadmium, total recoverable	µg/L	0.51	0.001	0.3	53
Chloride (as Cl)	mg/L	88.6	0.01	9.8	176
Chromium, total recoverable	µg/L	10	0.005	3.2	10
Copper, total recoverable	µg/L	130	0.005	5.5	53
Electrical Conductivity (EC)	µS/cm	5720	0	2333	176
Fluoride	mg/L	2.6	0.005	0.34	168
Iron, total	mg/L	249	0.01	6.9	87
Lead, total recoverable	µg/L	8.8	0.001	1.3	53
Mercury, total recoverable	µg/L	5	0.0001	0.86	10
Nitrogen, total	mg/L	1100	0.008	43	53
Nitrate + nitrite as nitrogen	mg/L	16	0.003	0.23	176
Oil and grease	mg/L	3.11	0.65	1.4	69
pH	s.u.	9.75	6.1	8.2	204
Phosphorus, total	mg/L	1	0.002	0.15	53
Selenium, total	µg/L	5	0.001	0.96	63
Settleable solids	ml/L	98	0.5	6.6	16
Silver, total recoverable	µg/L	0.2	0.001	0.15	2
Sodium adsorption ratio (SAR)	Ratio	39.1	0.01	7.7	177
Sulfate	mg/L	3570	0.02	961	204
Total dissolved solids (TDS)	mg/L	6020	10	1818	204
Total suspended solids (TSS)	mg/L	1270	1	54	101
Zinc, total recoverable	µg/L	35.5	0.01	8.7	53
Footnotes:					
(1) Minimum value is the detection limit if the minimum value is a measurement reported as non-detect.					
(2) Detection limits were substituted in calculation of the average for data that were below detection limits.					

1.2.6 Other Information

Application Form 1 lists the following environmental permits that are applicable to the Facility: DEQ AQP-1483-08, SMP-C1984003B, and NOI-N2006005 (application for the AM5 amendment to SMP-C1984003B).

2 RATIONALE FOR EFFLUENT LIMITATIONS

The control of pollutants discharged is established through effluent limitations and other requirements in MPDES permits. There are two principal bases for effluent limitations: technology-based effluent limitations (TBELs) that attain industry specific technology-based standards and limitations specified in the federal regulations and water quality-based effluent limitations (WQBELs) that attain and maintain applicable state numeric and narrative water quality standards. MPDES permits must include conditions that meet all applicable technology-based standards and limitations, at a minimum, and any more stringent WQBELs necessary to meet applicable state water quality standards.

2.1 Technology-based Effluent Limitations (TBELs)

Section 402(a)(1) of the federal Clean Water Act (CWA), the federal regulations at 40 CFR 125.3(a), and Montana regulations at ARM 17.30.1207 require that permits contain TBELs that implement the technology-based treatment requirements specified in the CWA. The technology-based requirements are national technology standards for existing sources or new sources established by the EPA. These standards are developed based on the performance of currently available treatment and control technologies for the industry, here surface coal mining.

2.1.1 *Scope and Authority*

EPA promulgated national TBELs and standards of performance for both existing and new sources at 40 CFR Subchapter N. These effluent limitations and standards are more commonly referred to as “effluent limitation guidelines” (ELGs). The Montana Board of Environmental Review adopted effluent limitations and standards, toxic effluent standards, and new source performance standards in ARM 17.30.1203, 1206, and 1207, respectively, based on the applicable federal regulation. These regulations state that technology-based treatment requirements specified in the CWA represent the minimum level of control that must be imposed in MPDES permits.

For existing sources, EPA developed ELGs representing the degree of effluent treatment currently available for existing facilities (best practicable control technology currently available or BPT), the best available technology economically achievable (BAT), and the best conventional pollutant control technology (BCT) for control of conventional pollutants.

For new sources, EPA developed new source performance standards. New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources as defined in ARM 17.30.1304(47) and 1340(1).

The Facility is a new source subject to New Source Performance Standards as defined at ARM 17.30.1304(47) and 1340(1).

2.1.2 Additional Requirements

All permit effluent limitations, standards, or prohibitions for a metal must be expressed as total recoverable metal unless the applicable effluent standard or limitation has been expressed in another form; or the approved method for the metal only measures the dissolved form.

ARM 17.30.1345(6)(a) requires that discharge limitations for non-POTWs (industrial facilities) be stated as average monthly discharge limitations and maximum daily discharge limitations unless impracticable. ELGs with numeric limitations generally include both average monthly and maximum daily limitations.

2.1.3 Applicable Federal ELGs

The CWA requires the development of ELGs representing application of BPT, BAT, BCT, and NSPS. Effluent guidelines are promulgated by USEPA under the authority of Sections 301, 304, 306, 307, 308, 402, and 501 of the CWA (33 U.S.C. 1311, 1314, 1316, 1318, 1342, and 1361).

EPA established ELGs for the coal mining industry at 40 CFR Part 434, *Effluent Limitations Guidelines for the Coal Mining Point Source Category*, Subparts D – Alkaline Mine Drainage and F – Miscellaneous Provisions are applicable ELGs to the Facility, and are the basis of TBELs in this permit. In accordance with 40 CFR 434.61, for commingled waste streams, the most stringent TBELs for a pollutant apply. No coal preparation plant areas are proposed within the Facility so 40 CFR 434 Subpart B does not apply.

Outfalls 001 through 018 are associated with “new source coal mine,” as defined by the ELGs at 40 CFR 434.11(j). A new source coal mine is a coal mine that began construction or experienced a “major alteration” after May 4, 1984.

Alkaline Mine Drainage: Outfalls 001 through 018

The provisions described in 40 CFR Part 434, Subpart D are applicable to alkaline mine drainage. Alkaline mine drainage is water, drainage, or discharge that normally exhibits a pH equal to or greater than 6.0. Mine drainage is defined at 40 CFR 434.11(h) as any drainage, and any water pumped or siphoned, from an active mining area or a post-mining area. Pursuant to 40 CFR 434.40, TBELs for alkaline mine drainage are applicable to drainage from an active mining area of coal of any rank. The Facility meets the definition of “new source coal mine” pursuant to 40 CFR 434.11(j) and is subject to the New Source Performance Standards as defined at 40 CFR 434.45. See Table 5 for applicable TBELs.

Table 5. TBELs – Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018

Parameter	Units	Daily Maximum Limitation	30-day Average Limitation	Category
Iron, total	mg/L	6.0	3.0	NSPS ¹
Total suspended solids	mg/L	70.0	35.0	NSPS ¹
pH	s.u.	6.0 – 9.0 at all times		NSPS ¹
Footnotes: (1) New source performance standards are applicable to all outfalls (40 CFR 434.45).				

Precipitation Events: Outfalls 001 through 018

For discharges driven by precipitation events, alternative effluent limitations are established in the permit, based on 40 CFR 434.63, instead of otherwise applicable effluent limitations.

Storm Events Less than or Equal to the 10-year, 24-hour Event.

Precipitation-driven discharges are subject to the ELGs at 40 CFR 434.63(a)(2), for any discharge or increase in the volume of discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume). The National Oceanographic and Atmospheric Administration (NOAA) Atlas 2, Volume 1 (1973) defines the 10-year, 24-hour precipitation for the Facility location as 2.4 inches. See Table 6.

Table 6. TBELs - Precipitation Events Less Than or Equal to the 10-yr, 24-hr Event – Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018

Parameter	Units	Daily Maximum Limitation	30-day Average Limitation
Settleable solids	ml/L	0.5	---
pH	Standard units	Between 6.0 and 9.0 at all times	

Storm Events Greater than the 10-yr, 24-hr Precipitation Event.

Precipitation driven discharges or increases in the volume of discharges caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) of 2.4 inches (NOAA Atlas 2, Vol. 1, 1973), are subject to the following effluent limitations, pursuant to 40 CFR 434.63(d)(2). See Table 7.

Table 7. TBELs - Precipitation Events Greater Than the 10-yr, 24-hr Event – Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018

Parameter	Units	Daily Maximum Limitation	30-day Average Limitation
pH	Standard units	Between 6.0 and 9.0 at all times	

2.1.4 Western Alkaline Standards

The Facility meets the definition of a western coal mining operation by operational, location, and climatic criteria:

- a. The facility is a surface coal mine.
- b. The facility is located within the interior western United States (southeastern Montana), west of the 100th meridian (106° W).

- c. The region containing the Facility is classified as a cold semi-arid climate (BSk, Köppen climate classification), with an average annual precipitation of 26.0 inches or less (14.6" in NOAA long term normal 1981-2010).

The provisions described in 40 CFR 434, Subpart H are applicable to reclamation areas, brushing and grubbing areas, topsoil stockpiling areas, and regraded areas meeting definition criteria outlined at §434.80. The Western Alkaline Coal Mining ELGs can be applied to outfalls associated with drainage from the areas described above when all the applicability criteria outlined in §434.81 are met. These provisions are not applicable to active mining areas, as defined by 40 CFR 434.11, or to coal preparation and coal preparation plant areas.

ELGs for the Western Alkaline Coal Mining subcategory require the following, which establish narrative effluent limitations in applicable areas:

- a. The operator must submit a site-specific Sediment Control Plan (SCP) to the permitting authority that is designed to prevent an increase in the average annual sediment yield from pre-mined, undisturbed conditions. The Sediment Control Plan must be approved by the permitting authority and be incorporated into the permit as an effluent limitation. The Sediment Control Plan must identify best management practices (BMPs) and must also describe design specifications, construction specifications, maintenance schedules, criteria for inspection, and expected performance and longevity of the BMPs.
- b. Using watershed models, the operator must demonstrate that implementation of the Sediment Control Plan will result in average annual sediment yields that will not be greater than the sediment yields from pre-mined, undisturbed conditions. The operator must use the same watershed model that was, or will be, used to acquire the SMCRA permit.
- c. The operator must design, implement, and maintain BMPs in the manner specified in the Sediment Control Plan.

Following recovery of coal, distribution of spoil, and initial contouring consistent with post-mine contouring requirements of SMP C1984003B, active mine areas transition to reclamation areas upon associated bond release requirements described at ARM 17.24.1116(6). Drainage areas wholly within phase 2 or greater bond release status, except water management facilities as described in MCA 82-4-235(3), are subject to the effluent limitations for Western Alkaline Coal Mining (40 CFR 434, subpart H). Upon transition to effluent limitations for Western Alkaline Coal Mining and after Permit modification to incorporate the change, the effluent limitations for active mining are no longer applicable and Western Alkaline Coal Mining ELGs will represent the degree of effluent reduction attainable through application of best practicable control technology (BPT), the best available technology economically achievable (BAT), and new source performance standards (NSPS).

Once the Permittee receives written approval/notification from DEQ for the Sediment Control Plan (SCP) and phase 2 bond release for the contributing basin, Western Alkaline Standards become the applicable effluent limitations for the specific outfalls. Changes to the permit as a result of outfall transition to Western Alkaline Standards are processed as a minor modification to the MPDES permit. Outfalls meeting the applicable criteria for Western Alkaline Standards will be subject to the effluent limitations enforceable under 40 CFR 434 Subpart H.

Permit modification for outfall transition to Western Alkaline Standards shall include specific Best Management Practice inspection, maintenance, and reporting conditions drawn from the Department approved SCP, or as determined by the Department.

2.2 Water Quality-based Effluent Limitations (WQBELs)

Permits are required to include WQBELs when TBELs are not adequate to prevent excursions of state water quality standards (WQS). Montana WQS include beneficial use classifications, numeric and/or narrative water quality standards, a nondegradation policy, and implementing regulations. The specific standards are given in ARM 17.30.621 through 629 and incorporated by reference. Circular DEQ-7 contains numeric water quality standards for protection of aquatic life and human health. The WQS applicable to receiving waters for the discharges regulated by this permit establish a basis for effluent limits in the permit.

2.2.1 Scope and Authority

The Montana Water Quality Act at 75-5-401(2), MCA states that a permit may only be issued if DEQ finds that the issuance or continuance of the permit will not result in pollution of any state waters. Montana WQS require that no wastes may be discharged such that the waste either alone or in combination with other wastes will violate or can reasonably be expected to violate any standard.

2.2.2 Water Use Classification and Standards

The beneficial uses summarized in Table 8 apply to the receiving waters identified in Table 1, which are located in the Rosebud (10100003) hydrological unit of the Middle Yellowstone watershed. The receiving waters fall under the Water-Use Classifications for the Yellowstone River drainage from the Billings water supply intake to the North Dakota state line [ARM 17.30.611(1)(c)]. Lee Coulee, Fossil Fork of Lee Coulee, tributaries to Fossil Fork, and unnamed tributaries to Richard Coulee are tributaries to Rosebud Creek which is tributary to the Yellowstone River. The designated water-use classification for Lee Coulee, Richard Coulee, and their tributaries is C-3. Discharges to C-3 waters must comply with the specific WQS in ARM 17.30.629, as well as numeric water quality criteria in Circular DEQ-7.

According to the analysis conducted as part of the Rosebud Mine Area B AM5 CHIA and EIS, at the point of discharge for all permitted outfalls, the hydrologic condition of the receiving water is ephemeral, as defined at ARM 17.30.602(10). (See DEQ 2022a at section 3.5, DEQ 2022b at sections 2.1, 7.1.5, and 9.6.5)

Table 8. Beneficial Uses

Classification	Beneficial Uses
C-3	<ul style="list-style-type: none"> • Bathing, swimming, and recreation • Growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl, and furbearers • Natural water quality is marginally suitable for drinking, culinary and food processing purposes, agriculture, and industrial water supply.

2.2.3 Impaired Waters

Lee Coulee, Fossil Fork of Lee Coulee, unnamed tributaries to Fossil Fork, and unnamed tributaries to Richard Coulee are not listed in the State of Montana Integrated 303(d) List and 305(b) Water Quality Report as the waters have not been assessed. The Lee Coulee and Richard Coulee drainages discharge to Rosebud Creek, assessment unit MT42A001_012. This segment of Rosebud Creek, from the Northern Cheyenne Reservation boundary to boundary at S28/29 T6N R42E, is listed a category 4C indicating that at least one designated use is not being supported or is threatened, but a TMDL is not needed because the impairment or threat is not caused by a pollutant. Rosebud Creek is identified as not fully supporting aquatic life. The probable cause of impairment is unknown and the probable source is dam construction other than upstream flood control projects.

The distance from each outfall and change in elevation to the point of confluence with Rosebud Creek was provided by the permittee and is summarized in Table 9.

Table 9. Distance from Outfall to Rosebud Creek

Outfall	Approximate Distance Between Outfall Location and Rosebud Creek	Approximate Elevation Difference Between Outfall Location and Rosebud Creek
001	7 miles	320 feet
002	7 miles	310 feet
003	6 miles	310 feet
004	6 miles	310 feet
005	6 miles	310 feet
006	6 miles	300 feet
007	6 miles	300 feet
008	7 miles	520 feet
009	7 miles	540 feet
010	7 miles	520 feet
011	6 miles	470 feet
012	6 miles	420 feet
013	7 miles	430 feet
014	7 miles	480 feet
015	7 miles	530 feet
016	8 miles	570 feet
017	8 miles	570 feet
018	8 miles	570 feet

2.2.4 *Applicable Water Quality Standards*

The Montana WQS include both numeric and narrative standards that protect the beneficial uses set forth in the water use classifications. General treatment standards in ARM 17.30.635 and general prohibitions in ARM 17.30.637 apply to all discharges from the facility.

ARM 17.30.637(1) requires that state waters must be free from substances . . . that will: “(a) settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines; (b) create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter) or globules of grease or other floating materials; (c) produce odors, colors or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible; (d) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; and (e) create conditions which produce undesirable aquatic life.” See ARM 17.30.637(1).

Effluent limitations based on the narrative prohibition of substances that will cause toxicity in state surface water are developed with whole effluent toxicity (WET) tests. WET test results are expressed as pass or fail. There is no numeric standard for WET. WET methods may also be used to develop no observed effects levels for pollutants regulated by narrative standards.

Discharges to tributaries of the Rosebud Creek sub-basin must comply with the numeric standards for electrical conductivity (EC) and sodium adsorption ratio (SAR) in ARM 17.30.670(4). ARM 17.30.670(4) sets forth numeric standards for electrical conductivity (EC) and sodium adsorption ratio (SAR). Tributaries in the Rosebud Creek watershed must meet the following standards:

1. The monthly average numeric water quality standard for EC is 500 $\mu\text{S}/\text{cm}$ and no sample may exceed an EC value of 500 $\mu\text{S}/\text{cm}$; and
2. From March 2 through October 31, the monthly average numeric water quality standard for SAR is 3.0 and no sample may exceed an SAR value of 4.5. From November 1 through March 1, the monthly average numeric water quality standard for SAR is 5.0 and no sample may exceed an SAR value of 7.5.

Effluent limitations set forth by the permit for all outfalls discharging to Rosebud Creek must address the standards of ARM 17.30.670(4). This includes discharges to the Lee Coulee and Richard Coulee drainages. As outlined in DEQs white paper titled A Review of the Rationale for EC and SAR Standards, WQS for EC and SAR may be developed and based on the natural condition of the receiving water. The natural condition is determined through monitoring, interpretation of historic data, and modeling. The standards in ARM 17.30.670(4) are applicable as the permittee has not provided a demonstration of the natural conditions of the receiving water.

ARM 17.30.637(4) is specific to ephemeral streams of all beneficial use classes and prescribes the standards applicable to protect the uses of hydrologically ephemeral streams. Pursuant to ARM 17.30.637(4), the applicable WQS for hydrologically ephemeral streams include the minimum treatment requirements in ARM 17.30.1203; the operation standards, sampling and analytical methods; and the general prohibitions in ARM 17.30.635 through 17.30.637, 17.30.640, 17.30.641, 17.30.645, and 17.30.646. The specific WQS for C-3 waters provided at ARM 17.30.629(2) do not apply to ephemeral streams pursuant to ARM 17.30.637(4).

For new sources, effluent limitations for numeric and narrative standards are modified by the criteria in ARM 17.30.715 which are based on the protection of existing water quality. Section 2.2.5 discusses any applicable nondegradation criteria for the receiving waters.

2.2.5 Nondegradation

The Montana Water Quality Act includes a nondegradation policy in 75-5-303, MCA, which is implemented through Administrative Rules of Montana Title 17, Chapter 30, Subchapter 7. The nondegradation policy applies to any new or increased activity which results in a change in existing water quality. The three aspects of the State nondegradation policy parallel the three “tiers” of the federal antidegradation policy at 40 CFR 131.12.

All proposed outfalls for the Facility are new sources, as defined at ARM 17.30.702(17), and subject to review under the nondegradation rules. The receiving waters for discharges from Outfalls 001 through 018 – Lee Coulee, Fossil Fork of Lee Coulee, tributaries to Fossil Fork, and tributaries to Richard Coulee – are hydrologically ephemeral. These waters do not meet the definition of high-quality water, as defined at 75-5-103(12), as they have zero flow or surface expression for more than 270 days in most years. Therefore, these are afforded Tier 1 protection meaning existing and anticipated uses and water quality necessary to protect those uses must be maintained, see 75-5-303(1), MCA and ARM 17.30.705(2)(a).

2.2.6 Mixing Zones

The Permittee did not request a mixing zone for aquatic life or human health water quality standards. The receiving waters for the permittee’s discharges are hydrologically ephemeral and, therefore, the critical low flows for the receiving waters are zero and would provide no water for a mixing zone. As such, final effluent limitations must be achieved at the point of discharge.

2.2.7 Pollutants of Concern

WQBELs are assessed for pollutants of concern (POC) based on effluent characteristics and water quality objectives for the affected receiving waters. DEQ has identified the POCs listed below for purposes of assessing WQBELs. Included in this list is any pollutant that has an assigned wasteload allocation as part of a TMDL, exceeds a water quality standard or nondegradation criterion in the effluent, or is subject to a federal ELG.

Table 10. Pollutants of concern for Outfalls 001-018.

Parameter	Basis for Identifying as a Pollutant of Concern
Iron, total Total suspended solids (TSS) Settleable solids pH	ELGs for coal mines found at 40 CFR Part 434, Subpart D
Flow Nitrate plus nitrite Oil and grease Electrical conductivity Sodium adsorption ratio	Administrative Rules of Montana Title 17, Chapter 30, Subchapter 6 and subchapter 7.

2.2.8 Reasonable Potential Analysis (RPA)

No wastes may be discharged, alone or in combination with other wastes or activities, that will violate or can reasonably be expected to violate any of the WQS. Limitations must be established in permits to control all pollutants or pollutant parameters that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any WQS. A “reasonable potential analysis” (RPA) is used to determine whether a discharge, alone or in combination with other sources of pollutants already present in the water body, could lead to an excursion above a numeric or narrative WQS.

When determining the need for WQBELs for individual pollutants regulated by standards expressed in terms of concentration, DEQ primarily uses a mass-balance equation. The mass-balance equation, provided below, is a steady state equation used to determine the concentration of a pollutant after accounting for other sources of pollution in the receiving water and any dilution provided by a mixing zone.

$$Q_r C_r = Q_s C_s + Q_d C_d$$

Where:

Q_s = critical receiving water flow at point of discharge

C_s = critical receiving water pollutant concentration

Q_d = critical effluent flow

C_d = critical effluent pollutant concentration

Q_r = resultant in-stream flow after discharge

C_r = resultant in-stream pollutant concentration

When the receiving water is an ephemeral stream, as defined at ARM 17.30.602(10), the critical receiving water flow is equal to zero and the critical effluent pollutant concentration is equal to the resultant in-stream pollutant concentration after discharge.

There is reasonable potential and WQBELs must be included in the permit where the projected receiving water concentration (C_r) exceeds a numeric standard or any applicable nondegradation criterion for the parameter of concern, as determined from the available effluent data.

In addition to numeric water quality standards, effluent limitations must be included in permits if there is a reasonable potential to exceed narrative standards.

The aggregate toxicity of the whole effluent must also be considered and effluent limitations included where there is a reasonable potential to cause or contribute to toxicity.

In general, there are two scenarios when a discharge may occur from the proposed Facility: 1) a planned discharge and 2) a precipitation-driven discharge. DEQ evaluated the reasonable potential for the discharge to cause or contribute to an excursion of applicable water quality standards found in ARM 17.30 Subchapter 6 with consideration of the ephemeral nature of the receiving waters.

Appendix F provides additional detail and specific procedures included in the RPA.

RPA Discussion

The water quality standards for EC and SAR at ARM 17.30.670(4) apply to all discharges from the facility. RPA was performed using the estimated effluent water quality data, as described in Section 1.2.5 of this fact sheet. The natural conditions of EC and SAR in the receiving waters have not been determined.

The project maximum effluent concentration was compared directly to the water quality standard. Reasonable potential was found to exist for EC and SAR for discharges to Lee Coulee, Fossil Fork of Lee Coulee, unnamed tributaries to Fossil Fork, and unnamed tributaries to Richard Coulee. Therefore, WQBELs for EC and SAR will be included in the Permit. See Appendix G for the corresponding effluent limitation calculations.

2.3 Final Effluent Limitations

This permit consists of effluent limits for individual pollutants. The TBELs consist of restrictions on total suspended solids, settleable solids, total iron, and pH, as discussed in Section 2.1 of this Fact Sheet. TBELs are the applicable Federal minimum technology-based pollutant restriction requirements. Effluent limits for oil and grease are based on ARM 17.30.637(1)(b). Effluent limits for EC and SAR are based on ARM 17.30.670(4).

This is a new permit, as such the anti-backsliding provisions in Section 402(o) of the CWA and 40 CFR 122.44(l) are not applicable.

2.3.1 Narrative Effluent Limitations

- There shall be no discharge from any outfall listed in Table 1 that reacts or settles to form an objectionable sludge deposit or emulsion beneath the surface of the receiving water or upon adjoining shorelines.
- There shall be no discharge from any outfall listed in Table 1 of floating debris, scum, a visible oil film or globules of grease or other floating materials.
- There shall be no discharge from any outfall listed in Table 1 that produce odors, colors, or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible.
- There shall be no discharge from any outfall listed in Table 1 that creates conditions that produce undesirable aquatic life; and
- There shall be no discharge from any outfall listed in Table 1 that creates concentrations or combinations of materials with are toxic or harmful to human, animal, plant, or aquatic life.
- Each outfall listed in Table 1 will be associated with a sediment pond designed and used to capture and contain the stormwater runoff from a 10-year, 24-hour storm event (2.4 inches). The permittee shall employ best management practices that meet, at a minimum, the water quality performance standards in ARM 17.24.633 and 17.24.638; the requirements for sediment control measures in ARM 17.24.638; the requirements for discharge structures in ARM 17.24.640; the requirements to mitigate and prevent discharges that may affect human health or

the environment in ARM 17.30.1342(4); and requirements to properly operate and maintain all facilities and systems of treatment and control in accordance with ARM 17.30.1342(5).

- The permittee shall avoid discharge from any outfall listed in Table 1 unless necessary due to planned maintenance events that are required for compliance with SMP C1984003B or unless related to precipitation events (of snowmelt of equivalent volume) in excess of a 10-year, 24-hour event. The permittee has the burden of proof to demonstrate and document that any discharge was necessary due to planned maintenance events required for compliance with SMP C1984003B or discharges related to precipitation events (or snowmelt of equivalent volume) in excess of a 10-year, 24-hour event.

2.3.2 Numeric Effluent Limitations

Numeric effluent limitations for all outfalls are summarized in Table 11. These limitations are enforceable and apply to planned discharges, not to discharges driven by precipitation and snow melt events.

Table 11. Summary of Final Numeric Effluent Limitations – Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Total suspended solids	mg/L	35	70
pH	S.U.	Between 6.0 and 9.0 at all times	
Oil and grease	mg/L	--	10
Iron, total	mg/L	3.0	6.0
EC	µS/cm	500	500
SAR ⁽¹⁾⁽³⁾	Ratio	3.0	4.5
SAR ⁽²⁾⁽³⁾	Ratio	5.0	7.5
Footnotes:			
(1) Applicable to discharges occurring March 2 through October 31.			
(2) Applicable to discharges occurring November 1 through March 1.			
(3) SAR is calculated using effluent concentrations of dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na^+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$			

2.3.3 Alternate Numeric Effluent Limitations

The limitations in Table 12 apply to precipitation-driven discharges for all outfalls. For precipitation-driven discharges, these limitations are enforced instead of limitations applicable to planned discharge conditions. The permittee bears the burden of proof that the discharge or increase in discharge was caused by an applicable precipitation event. The permittee must provide written notification for a precipitation-driven discharge event to DEQ within 30 days of the discharge event or increase in discharge. Precipitation monitoring results demonstrating precipitation volume (or snowmelt equivalent) are required with notification of a precipitation-driven event.

Table 12. Summary of Alternate Numeric Effluent Limitations for Precipitation Events – Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018

Parameter	Units	Effluent Limitations
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		Average Monthly	Maximum Daily
Settleable solids ⁽¹⁾	mg/L	--	0.5
pH ⁽¹⁾⁽²⁾	S.U.	Between 6.0 and 9.0 at all times	
Oil and grease ⁽¹⁾⁽²⁾	mg/L	--	10
EC ⁽¹⁾⁽²⁾	μS/cm	--	500
SAR ⁽¹⁾⁽²⁾⁽³⁾⁽⁵⁾	Ratio	--	4.5
SAR ⁽¹⁾⁽²⁾⁽⁴⁾⁽⁵⁾	Ratio	--	7.5
Footnotes: (1) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period <u>less than or equal to</u> the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) of 2.4 inches. (2) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period <u>greater than</u> the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) of 2.4 inches. (3) Applicable to discharges occurring March 2 through October 31. (4) Applicable to discharges occurring November 1 through March 1. (5) SAR is calculated using effluent concentrations of dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na^+]/\sqrt{0.5 * ([Ca^{2+}] + [Mg^{2+}])}$			

3 RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 2.5 of the permit establishes monitoring and reporting requirements to implement Federal and State requirements. The following provides the rationale for the monitoring and reporting requirements for this facility.

3.1 Sample Methods

All analytical procedures must comply with the specifications of 40 CFR 136 and the analyses must achieve the required reporting value (RRV) specified in the latest version of Department Circular DEQ-7 unless otherwise specified. The RRVs specified in the following monitoring tables are included for convenience and are the RRVs at the time of permit development. RRVs are subject to change during water quality standards triennial review. Samples shall be collected, preserved, and analyzed in accordance with approved procedures listed in 40 CFR 136.

3.2 Monitoring Requirements

The monitoring and reporting requirements of parameters for planned discharges are summarized in Table 13.

All permit effluent limitations, standards, or prohibitions for a metal must be expressed as total recoverable metal unless the applicable effluent standard or limitation has been expressed in another form, or the approved method for the metal only measures the dissolved form (e.g. hexavalent chromium).

Table 13. Summary of Monitoring Requirements – Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018

Parameter	Units	Sample Type	Minimum Monitoring Frequency	Reporting Requirement	RRV ⁽¹⁾
Effluent Flow	mgd	(2)	Continuous	Daily Max. & Mo. Avg.	NA
Duration of Discharge	Hours		Continuous	Daily Max. & Mo. Avg.	NA
pH	s.u.	Instantaneous or Grab	Daily	Daily Max. & Daily Min.	NA
Total Suspended Solids	mg/L	Grab	Daily	Daily Max. & Mo. Avg.	NA
Iron, Total Recoverable	µg/L	Grab	Daily	Daily Max. & Mo. Avg.	20
Electrical conductivity	µS/cm	Grab	Daily	Daily Max. & Mo. Avg.	NA
Sodium adsorption ratio	Ratio	Calculated ⁽³⁾	Daily	Daily Max. & Mo. Avg.	NA
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Aluminum, Dissolved	µg/L	Grab	Monthly	Daily Max. & Mo. Avg.	9

Parameter	Units	Sample Type	Minimum Monitoring Frequency	Reporting Requirement	RRV ⁽¹⁾
Nitrate + nitrite, as N	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	0.020
Selenium, Total Recoverable	µg/L	Grab	Monthly	Daily Max. & Mo. Avg.	1
Arsenic, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	1
Cadmium, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.03
Chromium, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	10
Copper, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	2
Lead, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.3
Mercury, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.005
Nickel, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	2
Silver, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.2
Zinc, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	8
Footnotes:					
(1) Required reporting values (RRV) for parameters listed in Circular DEQ-7 Montana Numeric Water Quality Standards are current as of June 2019.					
(2) Requires a recording device or totalizer.					
(3) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium, and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na^+] / \sqrt{0.5 * ([Ca^{2+}] + [Mg^{2+}])}$					

3.3 Alternate Monitoring Requirements

Alternate monitoring requirements for discharges caused by precipitation-driven events are summarized in Table 14 and Table 15. The Permittee shall have the burden of proof that any discharge was a result of a precipitation event and that these alternate monitoring requirements are applicable.

The Permittee shall collect a grab sample within the first thirty minutes of discharge from any permitted outfall for any discharge which results from a precipitation related event. As an alternative to a single grab sample, the Permittee may take a flow-weighted composite of either the entire discharge or for the first three hours of the discharge. For a flow-weighted composite, only one analysis of the composited aliquots is required. Flow weighted composite samples are not allowed for pH and oil and grease.

Table 14. Summary of Monitoring Requirements for Precipitation-Driven Small Events⁽¹⁾ – Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018

Parameter	Units	Sample Type	Minimum Monitoring Frequency	Reporting Requirement	RRV ⁽²⁾
Effluent Flow	mgd	(2)	Continuous	Daily Max. & Mo. Avg.	NA
Duration of Discharge	Hours		Continuous	Daily Max. & Mo. Avg.	NA
pH	s.u.	Instantaneous or Grab	Daily	Daily Max. & Daily Min.	NA
Settleable Solids	ml/L	Grab	Daily	Daily Max. & Mo. Avg.	NA
Total Suspended Solids	mg/L	Grab	Daily	Daily Max. & Mo. Avg.	NA
Iron, Total Recoverable	µg/L	Grab	Daily	Daily Max. & Mo. Avg.	20
Electrical conductivity	µS/cm	Grab	Daily	Daily Max. & Mo. Avg.	NA
Sodium adsorption ratio	Ratio	Calculated ⁽³⁾	Daily	Daily Max. & Mo. Avg.	NA
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Aluminum, Dissolved	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9
Nitrate + nitrite, as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.020
Selenium, Total Recoverable	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1
Arsenic, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	1
Cadmium, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.03
Chromium, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	10
Copper, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	2
Lead, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.3
Mercury, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.005
Nickel, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	2
Silver, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.2
Zinc, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	8

Parameter	Units	Sample Type	Minimum Monitoring Frequency	Reporting Requirement	RRV ⁽²⁾
Footnotes:					
(1) These monitoring requirements apply to any discharges or increases in volume of discharges caused by precipitation within any 24-hour period <u>less than or equal to</u> the 10-year, 24-hour precipitation event (or snowmelt of equal volume) of 2.4 inches.					
(2) Required reporting values (RRV) for parameters listed in Circular DEQ-7 Montana Numeric Water Quality Standards are current as of June 2019.					
(3) Requires a recording device or totalizer.					
(4) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium, and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na^+] / \sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}]))}$					

Table 15. Summary of Monitoring Requirements for Precipitation-Driven Large Events⁽¹⁾ – Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018

Parameter	Units	Sample Type	Minimum Monitoring Frequency	Reporting Requirement	RRV ⁽²⁾
Effluent Flow Rate	mgd	⁽³⁾	Continuous	Daily Max. & Mo. Avg.	NA
Duration of Discharge	Hours		Continuous	Daily Max. & Mo. Avg.	NA
pH	s.u.	Instantaneous or Grab	Daily	Daily Max. & Daily Min.	NA
Iron, Total Recoverable	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	20
Total Suspended Solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Sodium adsorption ratio	Ratio	Calculated ⁽⁴⁾	Weekly	Daily Max. & Mo. Avg.	NA
Aluminum, Dissolved	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9
Nitrate + nitrite, as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.020
Selenium, Total Recoverable	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1
Arsenic, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	1
Cadmium, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.03
Chromium, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	10
Copper, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	2
Lead, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.3

Parameter	Units	Sample Type	Minimum Monitoring Frequency	Reporting Requirement	RRV ⁽²⁾
Mercury, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.005
Nickel, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	2
Silver, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	0.2
Zinc, Total Recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	8
Footnotes: (1) These monitoring requirements apply to any discharges or increases in volume of discharges caused by precipitation within any 24-hour period <u>greater than</u> the 10-year, 24-hour precipitation event (or snowmelt of equal volume) of 2.4 inches. (2) Required reporting values (RRV) for parameters listed in Circular DEQ-7 Montana Numeric Water Quality Standards are current as of June 2019. (3) Requires a recording device or totalizer. (4) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium, and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na^+] / \sqrt{0.5 * ([Ca^{2+}] + [Mg^{2+}])}$					

3.4 Other Monitoring Requirements

3.4.1 Precipitation Monitoring

The Permittee is required to monitor and report precipitation in the Lee Coulee drainage basin using a precipitation gauge that meets the standards provided in National Weather Services (NWS) Instructional Bulletin 10-1302 (November 14, 2014), *Requirements and Standards for NWS Climate Observations*, which are provided in Table 16. Precipitation monitoring is required to provide evidence that a precipitation event resulted in a discharge and that alternate limitations and monitoring requirements apply.

Table 16. Precipitation Gauge Performance Standards

Manual Daily Precipitation – Gauge Standard					
Parameter	Requires	Seasonal	Range	Resolution	Measurement Activity
Precipitation, Rain	8-inch diameter collection vessel with tube and measuring stick	Funnel (All year except for snow or frozen precip. events)	0 to 20 inches	0.01 inches	±0.02 inches
	4-inch diameter collection vessel with tube	Funnel (All year except for snow or frozen precip. events)	0 to 10 inches	0.01 inches	±0.02 inches
Precipitation, Frozen (Liquid Equivalent)	8-inch diameter collection vessel	Open aperture (snow or frozen precip. Events)	0 to 24 inches of snow	0.01 inches melted	±0.04 inches melted
	4-inch diameter collection vessel	Open aperture (snow or frozen precip. Events)	0 to 12 inches of snow	0.01 inches melted	±0.04 inches melted
Snowfall / Snow Depth – Equipment Standard					
Snowfall/Snow Depth: 0.1 to 20 inches	Snow stick (marked) and Snow board	Not applicable	0 to 20 inches	0.1 inch	±0.1 inch
Snowfall/Snow Depth: 20 to 40 inches	Snow stick (marked) and Snow board		0 to 40 inches	0.1 inch	±0.1 inch
Snowfall/Snow Depth: 40 to 60 inches	Snow stake (marked)		0 to 60 inches	1 inch	±1 inch

3.4.2 Flow Monitoring and Sampling Units

The permit requires the permittee to install and use flow monitoring and sampling equipment at each outfall. This requirement is necessary because precipitation events are often localized, high intensity, short duration thunderstorms and the watersheds often cover vast and isolated areas. Ponds may retain water from previous events. Likewise, weather conditions may prevent access to outfalls for monitoring and discharge sampling. A crest gauge or equivalent equipment can measure flow at the crest, with the establishment of a ratings curve that shows the relationship between peak flow and gauge height. A remote sampling unit can sample a representative sample of the discharge effluent when discharge occurs. The discharge point and monitoring location shall be permanently marked and identified at the overflow structure.

3.4.3 Supplemental Monitoring and Studies

The permit requires supplemental monitoring and studies to demonstrate compliance with the narrative effluent limits in Section 1.2.1 of the permit.

Assessment of Naturally Occurring Conditions for Lee Coulee “Wet Reach” and Wetlands G047 and G054

The Permit requires an assessment of the naturally occurring conditions for Lee Coulee “Wet Reach” and Richard Coulee wetlands G047 and G054. The assessment must provide the naturally occurring conditions and consider seasonal variability. The assessment must describe:

- The aerial extent of the waterbody;
- Depth of the waterbody;
- Description of the water conditions (i.e., clear, murky, muddy, etc.);
- If the waterbody is dry, flowing, or standing;
- Description of the hydrologic condition of respective upstream receiving water, as described in Section 1.2.3; and
- Any relevant observations of vegetation and wildlife.

The assessment for each waterbody must be completed and submitted to the Department prior to construction of the associated outfalls.

Studies conducted as part of the permit application package for the AM5 amendment to SMP C1984003B may be submitted to fulfill this requirement if the study includes the assessment requirements listed above.

Inspections of the Lee Coulee “Wet Reach” and Richard Coulee Wetlands G047 and G054

The Permit requires visual inspections of the Lee Coulee “Wet Reach” and Richard Coulee wetlands G047 and G054 once per quarter and within 24 hours of any discharge event that reaches the waterbody. The inspection must describe the condition of the waterbody, including:

- Any changes to the aerial extent of the waterbody from the original assessment or previous inspection, whichever is most recent;
- Depth of the waterbody;
- Description of the water conditions (i.e., clear, murky, muddy, etc.);
- If the waterbody is dry, frozen, flowing, or standing;
- Description of the hydrologic condition of the respective upstream receiving water, as described in Section 1.2.3, during the time of inspection (i.e., flowing, standing water, dry, frozen, etc.);
- Any relevant observations of vegetation and wildlife;
- Weather conditions during the inspection; and
- Identification of all precipitation or discharge events for that quarter.

The inspections must be submitted to the Water Quality Division quarterly with a report that includes a discussion of observations made. Inspections completed in response to discharge events must be submitted to the Water Quality Division within 30 days of each discharge event. The permit requires an annual report be submitted to the Department that discusses the observations of the waterbodies

made throughout the year and any changes in hydrologic condition of the waterbody or receiving waters flowing into the waterbody.

Studies conducted as part of the Fish and Wildlife Plan, as required by SMP C1984003B, may be submitted to fulfill this requirement if the study includes the inspection requirements listed above.

Discharge Monitoring for Outfalls 001, 002, and 011 through 018

The Permit requires the permittee to monitor discharges from Outfalls 001, 002, and 011 through 018 and maintain a log of discharge events. The log must describe:

- The condition(s) causing the event;
- The date and start and end time of the discharge event;
- Volume of water discharged;
- Weather conditions;
- The farthest distance discharge traveled from the outfall location;
- Conditions of the receiving water at the time of discharge (for example: dry, frozen, flowing, or standing water);
- If the discharge reached the respective downstream waterbody; and
- If the discharge reached the respective downstream waterbody, inspection of the waterbody is required within 24 hours of the discharge event. (See previous supplemental monitoring requirement)

This log must be submitted to the Water Quality Division within 30 days of each discharge event. The permittee must notify the Department within 24 hours of becoming aware of any discharges that enter the Lee Coulee "Wet Reach," wetland G047, or wetland G054 and if the discharge exceeded any final effluent limit of the permit.

Surface Water Monitoring

The Permit requires the permittee to submit copies of all surface water (including streams, ponds, wetlands, and springs) monitoring data collected in compliance with the requirements of SMP C1984003B. The data must be submitted annually.

3.4.4 Other

In addition to the monitoring above, the Permittee must complete and submit Parts V and VI of U.S EPA Form 2C within two years of beginning discharge.

4 RATIONALE FOR SPECIAL CONDITIONS

Special conditions are included in MPDES permits when necessary to provide for and assure compliance with additional requirements of the Montana Water Quality Act or Federal Clean Water Act and applicable regulations. ARM 17.30.1344. Special conditions include but are not limited to: collection of additional data, studies or supplemental monitoring, preventative measures, best management practices (BMPs), compliance schedules, ground water protection, programmatic conditions such as pretreatment, sewage sludge or sewer overflow, or toxicity studies. This section provides the rationale for the special conditions included in the permit.

4.1 Toxicity Identification Evaluation/Toxicity Reduction Evaluation – Not applicable

4.2 Western Alkaline Standards

The permittee shall submit a Sediment Control Plan, watershed model, and a schedule of BMP/BTCA implementation and maintenance meeting the requirements of 40 CFR 434 Subpart H to the department for approval prior to conversion of any permitted outfall to Western Alkaline Standard status. Outfalls are only eligible for conversion to Western Alkaline Standards effluent limitations described in Section 2.1.4 of this fact sheet when the entire contributing drainage of the outfall has been released from phase 2 bonding under SMP C1984003B. Notice of intent to convert an outfall to Western Alkaline Standards status shall be provided by the applicant at the time of bond release application under SMP C1984003B. Notification of phase 2 bond release by the Department shall be provided to the MPDES file by the applicant within 30 days of successful phase 2 bond release. The phase 2 bond release must apply to the permitted outfalls in the entire contributing watershed, except as described in 82-4-235(3), MCA. Following a minor modification to MT0032042, pursuant to ARM 17.30.1362, effluent limitations for an applicable outfall convert to Western Alkaline Standards as described in Section 2.1.4 of this fact sheet.

4.3 Reopener Provisions

These provisions are based on 40 CFR Part 122. DEQ may reopen the permit to modify permit conditions and requirements. Causes for modifications include the promulgation of new Federal regulations, modification in toxicity requirements, adoption of a TMDL, or adoption of new regulations by DEQ.

5 RATIONALE FOR STANDARD CONDITIONS

Standard conditions must be included in all MPDES permits and the Permittee must comply with all standard conditions at all times in accordance with ARM 17.30.1342. These requirements are expressly incorporated into the permit. In addition to these requirements, ARM 17.30.1343 and 40 CFR 122.42 establish additional conditions applicable to specific categories of MPDES permits including notification requirements for municipal and non-municipal dischargers.

6 PUBLIC PARTICIPATION

In accordance with ARM 17.30.1372, DEQ will issue Public Notice No. MT-22-10 on May 31, 2022. The public notice states that a tentative decision has been made to issue an MPDES permit for Westmoreland Rosebud Mining LLC Area B AM5 and that a draft permit, fact sheet, and environmental impact statement (EIS) have been prepared. The FEIS for the Rosebud Mine Area B AM5 Project serves as the required MEPA analysis for this draft MPDES permit. The FEIS also addresses impacts subject to regulation by Air Quality and Coal Mining. Public comments on the draft MPDES permit are invited any time prior to the close of business July 1, 2022. Comments may be directed to:

DEQ Water Quality Division
Water Protection Bureau
PO Box 200901
Helena, MT 59620

Or DEQWPBPublicNotices@mt.gov

All comments received or postmarked prior to the close of the public comment period will be considered in the formulation of the final permit. DEQ will respond to all substantive comments and issue a final decision as soon as possible after the close of the public comment period.

All persons, including Permittees, who believe any condition of a draft permit is inappropriate or that DEQ's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, shall raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period (including any public hearing) under ARM 17.30.1372.

6.1 Notification of Interested Parties

Copies of the public notice were mailed to the Permittee, state and federal agencies and interested persons who have expressed an interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this permit. In addition to mailing the public notice, a copy of the notice and applicable draft permit and fact sheet are posted on the DEQ website.

Any person interested in being placed on the mailing list for information regarding this MPDES Permit should contact DEQ, reference this Facility, and provide a name, address, and phone number.

6.2 Permit Appeal

After the close of the public comment period DEQ will issue a final permit decision. A final permit decision means a final decision to issue, deny, modify, revoke and reissue, or terminate a permit. A permit decision is effective 30 days after the date of issuance unless a later date is specified in the decision, a stay is granted pursuant to ARM 17.30.1379, or the Permittee files an appeal pursuant to 75-5-403, MCA.

The Permittee may file an appeal within 30 days of DEQ's action to the following address:

Secretary, Board of Environmental Review
Department of Environmental Quality
1520 East Sixth Avenue
PO Box 200901
Helena, Montana 59620-0901

7 NONSIGNIFICNCE DETERMINATION

The Montana Water Quality Act states that it is unlawful to cause degradation of state waters without an authorization issued pursuant to 75-5-303, MCA [75-5-605(1)(d), MCA]. ARM 17.30.706(2) states that DEQ will determine whether a proposed activity may cause degradation for all activities which are permitted, approved, licensed, or otherwise authorized by DEQ, such as issuance of a discharge permit. A nondegradation analysis was conducted in Section 2.2.5 of this fact sheet for the proposed discharges and activities regulated by this permit. Based on this analysis DEQ has made the following determination:

DEQ has determined that Outfalls 001 through 018 constitutes a new or increased source. Accordingly, the discharge is subject to the nondegradation policy at 75-5-303, MCA and ARM 17.30.705. Effluent limitations and conditions set by the permit are intended to ensure that applicable water quality standards are met at the point of discharge, that mine effluent will not impair receiving waters, and that existing and anticipated uses will be maintained and protected.

8 REFERENCES

BSM 2018. Hydrologic Demonstration Report, Area B Bond Release, Big Sky Mine. Water & Environmental Technologies. February 2018.

BSM 2019. Supplemental Water Quality Assessment, Area B Bond Release, Big Sky Mine. Water & Environmental Technologies. July 2019.

BSM 2019. Big Sky Mine Area B, Summary of Water Sources Affected by Mining and Water Sources Supporting Post-Mine Land Uses. July 2019.

Cedar Creek 2016. Rosebud Mine Area BESA – 2013-2016 Wetland and Waters Evaluation. Cedar Creek Associates, Inc. September 2016.

DEQ 2022a. Final Environmental Impact Statement, Rosebud Mine Area B AM5, Colstrip, Montana. Department of Environmental Quality. May 2022.

DEQ 2022b. Westmoreland Rosebud Mining, LLC, Rosebud Mine Area B AM5 Cumulative Hydrologic Impact Assessment. Department of Environmental Quality. May 2022.

ERM 2016a. 2016 Area B-Extension South Benthic Macroinvertebrate Survey. Environmental Resources Management. January 2016.

ERM 2016b. 2016 Area B-Extension South Benthic Macroinvertebrate Survey. Environmental Resources Management. October 2016.

USAEC 2017. Approved Jurisdictional Determination – Rosebud Mine Area BESA. Department of the Army Corps of Engineers. September 2017.

APPENDIX A. Facility Maps

Figure A-1. Rosebud Area B AM5 Outfall Map

Figure A-2. Outfalls 001 & 002 in relation to the Lee Coulee “Wet Reach”

Figure A-3. Outfalls 011-018 in relation to Richard Coulee wetlands G047 and G054.

Figure A- 1. Rosebud Area B AM5 Outfall Map

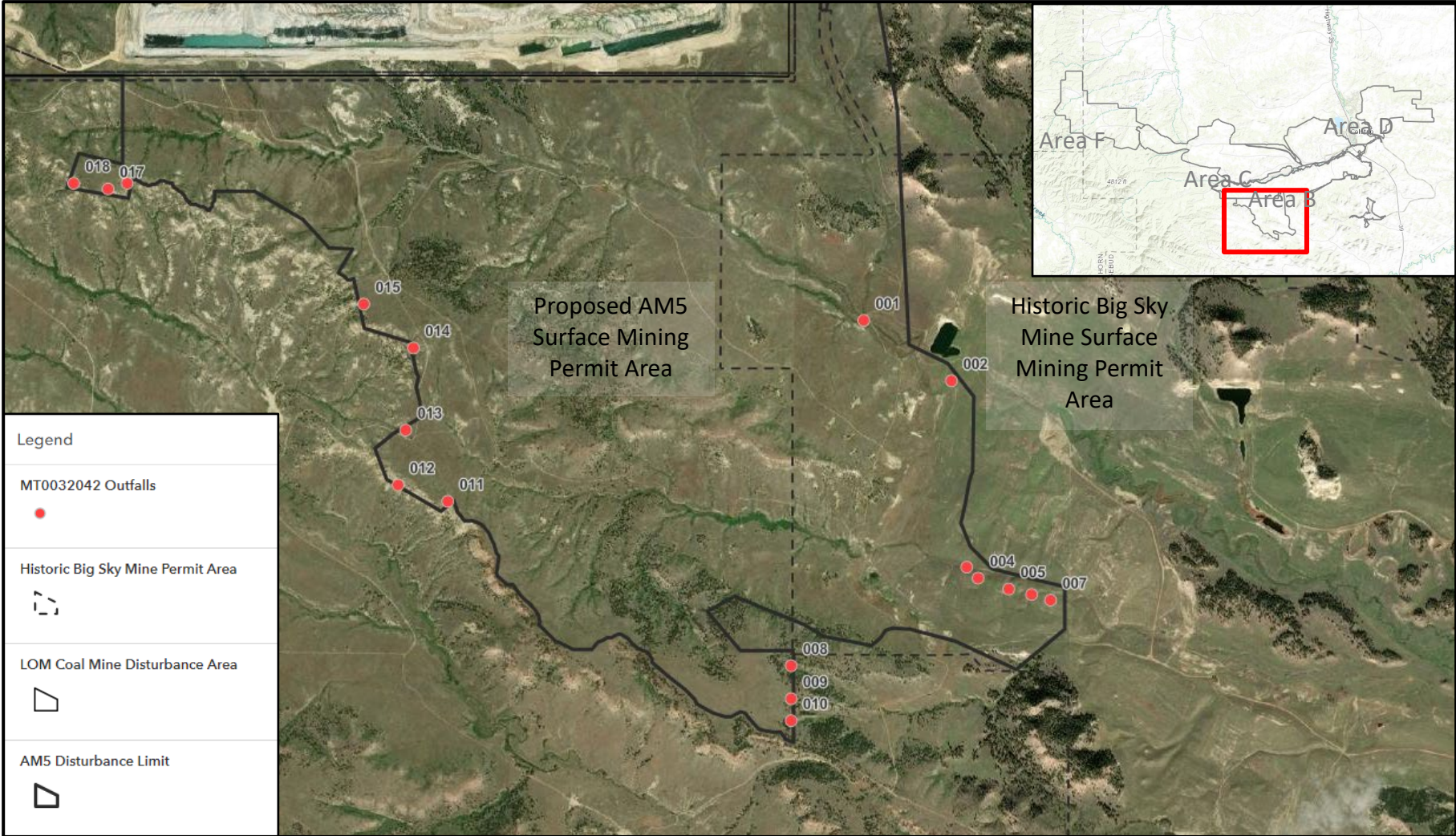


Figure A- 2. Outfalls 001 & 002 in relation to the Lee Coulee “Wet Reach”. Image modified from “Hydrologic Demonstration Report, Area B Bond Release Big Sky Mine” prepared by Water & Environmental Technologies, Bozeman, MT, for Big Sky Coal Company and submitted to DEQ Coal Program. (BSM 2018)

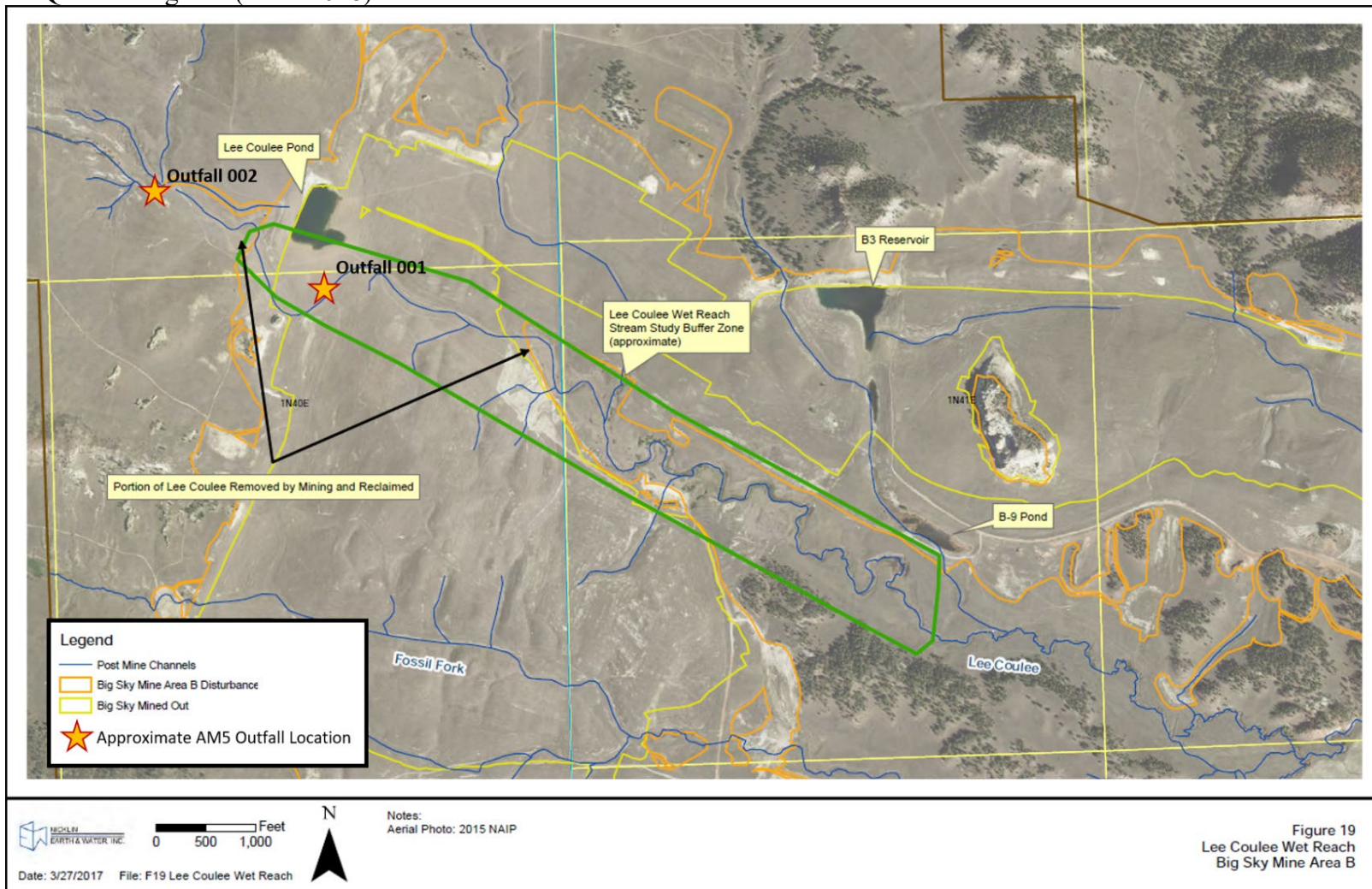
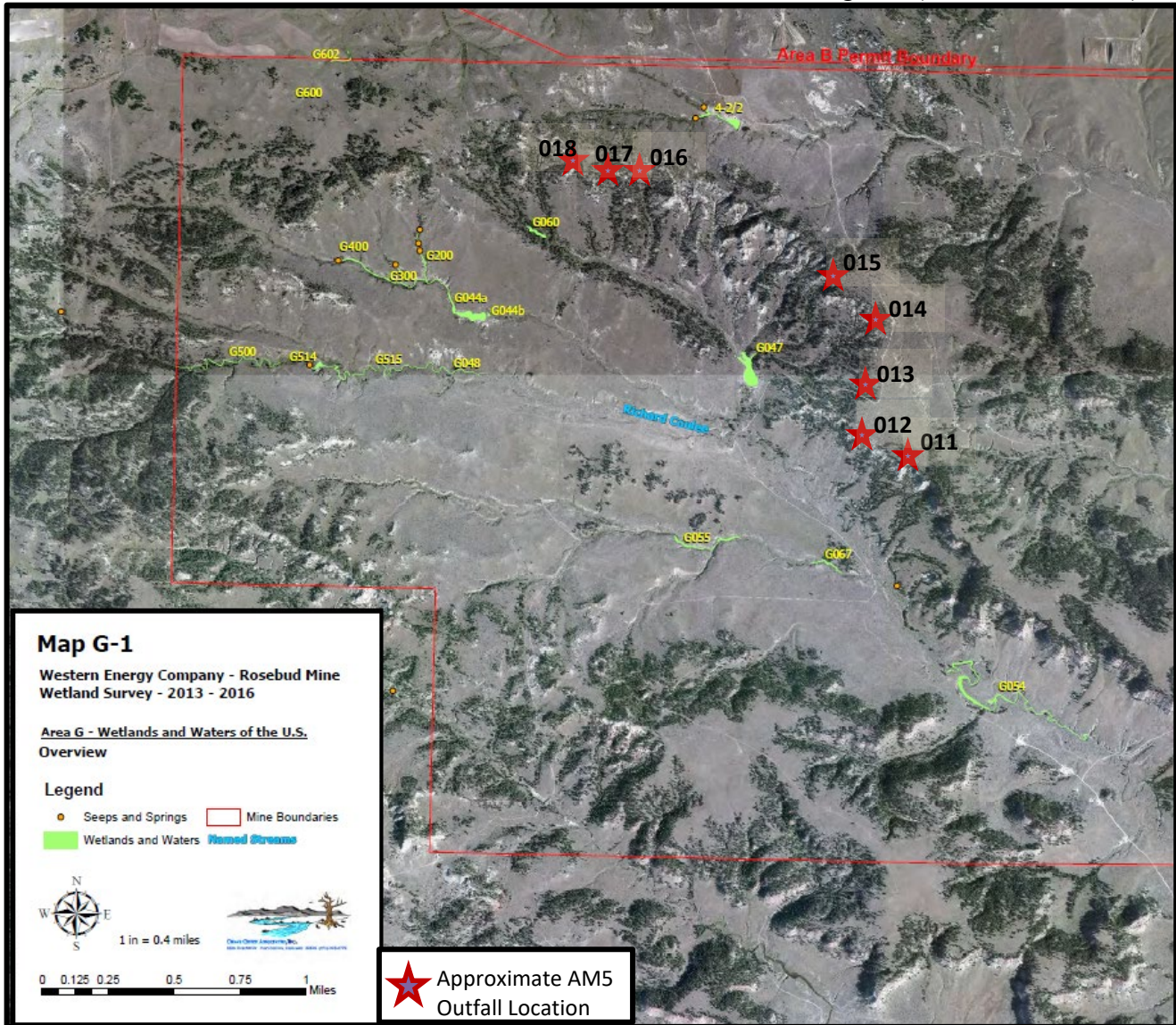
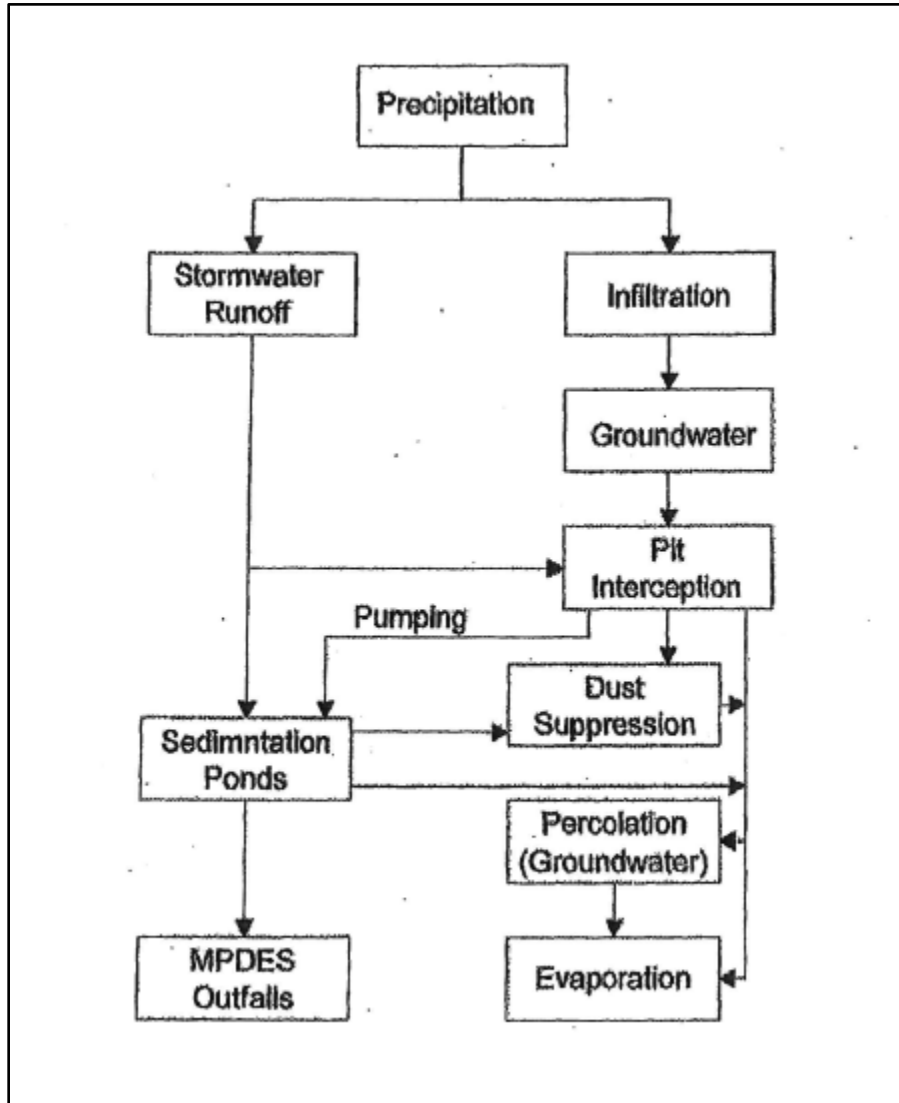


Figure A- 3. Outfalls 011-018 in relation to Richard Coulee wetlands G047 and G054. Image modified from “Rosebud Mine Area BESA – 2013-2016 Wetland and Waters Evaluation” prepared by Cedar Creek Associates, Inc., Fort Collins, CO, and submitted to DEQ Coal Program. (Cedar Creek 2016)



APPENDIX B. Facility Line Drawing



APPENDIX C. Approved Jurisdictional Determination



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
HELENA REGULATORY OFFICE
10 WEST 15TH STREET, SUITE 2200
HELENA, MONTANA 59626

September 26, 2017

Regulatory Branch
Montana State Program
Corps No. **NWO-2012-01315-MTB**

Subject: Approved Jurisdictional Determination – Rosebud Mine Area BESA

Western Energy Company – Rosebud Mine
Attn: Dicki Peterson
PO Box 99
Colstrip, Montana 59323

Dear Ms. Peterson:

We are responding to your request for an approved jurisdictional determination regarding the above-referenced project. The approximate 8,879-acre project site is located within the southern half of Township 1N Range 40E, Latitude 45.802986°, Longitude -106.739391°, Rosebud County, Montana.

An approved jurisdictional determination has been completed for Area BESA and is enclosed for your information. There are 21 wetlands and waters, totaling 18.99 acres, within the in the 8,879-acre study area that are not subject to the jurisdiction of the Clean Water Act. Department of the Army authorization, pursuant to Section 404 of the Clean Water Act (33 United States Code § 1344), is not required for dredge and/or fill activities in these areas. The boundaries of the study area are shown in Map G-1 of the report titled "Rosebud Mine Area BESA Wetland and Waters Evaluation" dated September 2016 by Cedar Creek Associates. The U.S. Environmental Protection Agency concurred with this isolated, non-jurisdictional determination on September 15, 2017.

This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. A Notification of Appeal Process (NAP) and Request for Appeal (RFA) form is enclosed. If you request to appeal this determination you must submit a completed RFA form to the Northwestern Division Office at the following address:

Regulatory Appeals Review Officer
US Army Corps of Engineers
Northwestern Division
Post Office Box 2870
Portland, Oregon 97208-2870

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In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by November 21, 2016. It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

This determination has been conducted to identify the limits of Corps of Engineers' Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

This determination is valid for five (5) years from the date of this letter, unless new information warrants revision of the determination before the expiration date.

Please refer to identification number NWO-2012-01315-MTB in any correspondence concerning this project. If you have any questions, please contact John Derbish at John.Derbish@usace.army.mil or (402) 996-3778.

Sincerely,



Todd N. Tillinger
Montana Program Manager

Enclosures:

Approved JD Form for Corps Identification Number NWO-2012-01315-MTB
Notification of Administrative Appeal Options and Process, and Request for Appeal

APPENDIX D. Summary of Effluent Quality Data for EC and SAR

The permittee must provide quantitative data on certain pollutants in the effluent (ARM 17.30.1322). As discussed in Section 1.2.5 of this fact sheet, multiple data sources were used to estimate effluent quality for the facility. Water quality data for EC is provided in Table 17; SAR (March 2 through October 31) in Table 18, and SAR (November 1 through March 1) in Table 19.

Table 17. Water quality data for EC.

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
Outfall 015	Outfall	Conductivity	4/30/15	2940	µS/cm
Outfall 015	Outfall	Conductivity	4/30/15	2940	µS/cm
Outfall 019	Outfall	Conductivity	4/30/15	3030	µS/cm
Outfall 019	Outfall	Conductivity	4/30/15	3030	µS/cm
Outfall 022	Outfall	Conductivity	3/31/21	1626.67	µS/cm
Outfall 026	Outfall	Conductivity	1/31/20	2763.7	µS/cm
Outfall 129	Outfall	Conductivity	1/31/20	2944	µS/cm
Outfall 129	Outfall	Conductivity	2/29/20	2994.55	µS/cm
BAL2011	Well	Conductivity	9/20/19	813	µS/cm
BAL2321	Well	Conductivity	9/20/19	2880	µS/cm
BGDSG	Spring	Conductivity	9/3/19	1200	µS/cm
BGDSG	Spring	Conductivity	9/3/19	1200	µS/cm
BGDSG	Spring	Conductivity	9/5/19	2	µS/cm
BMC114	Well	Conductivity	9/20/19	2910	µS/cm
BMC214	Well	Conductivity	9/13/19	2340	µS/cm
BOV112	Well	Conductivity	9/20/19	1380	µS/cm
BOV212	Well	Conductivity	9/13/19	1620	µS/cm
BRC113	Well	Conductivity	9/20/19	2600	µS/cm
BRC213	Well	Conductivity	9/13/19	2060	µS/cm
BRC9163	Well	Conductivity	9/12/19	1580	µS/cm
BSM115	Well	Conductivity	9/20/19	2810	µS/cm
BSM215	Well	Conductivity	9/13/19	1840	µS/cm
BSP9976	Well	Conductivity	9/23/19	3110	µS/cm
PO-011	Sediment Pond	Conductivity	5/31/17	1410	µS/cm
PO-013	Sediment Pond	Conductivity	5/31/17	5720	µS/cm
PO-013	Sediment Pond	Conductivity	5/31/17	5690	µS/cm
PO-013	Sediment Pond	Conductivity	5/31/17	3	µS/cm
PO-019	Sediment Pond	Conductivity	5/31/17	2210	µS/cm
PO-019A	Sediment Pond	Conductivity	5/31/17	1460	µS/cm
PO-026	Sediment Pond	Conductivity	5/31/17	2080	µS/cm
PO-046	Sediment Pond	Conductivity	5/31/17	2960	µS/cm
PO-137	Sediment Pond	Conductivity	5/31/17	2070	µS/cm

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
PO-21C	Sediment Pond	Conductivity	5/31/17	1080	µS/cm
PO-300	Stock Pond	Conductivity	10/11/16	3390	µS/cm
PO-300	Stock Pond	Conductivity	10/11/16	3370	µS/cm
PO-300	Stock Pond	Conductivity	10/11/16	1	µS/cm
PO-300	Stock Pond	Conductivity	5/31/17	2900	µS/cm
PO-300	Stock Pond	Conductivity	7/19/17	3640	µS/cm
PO-300	Stock Pond	Conductivity	7/19/17	3640	µS/cm
PO-300	Stock Pond	Conductivity	7/19/17	0	µS/cm
PO-300	Stock Pond	Conductivity	10/11/17	3570	µS/cm
PO-300	Stock Pond	Conductivity	10/11/17	3570	µS/cm
PO-300	Stock Pond	Conductivity	10/13/17	3	µS/cm
PO-300	Stock Pond	Conductivity	4/27/18	2310	µS/cm
PO-300	Stock Pond	Conductivity	6/14/18	1440	µS/cm
PO-300	Stock Pond	Conductivity	9/14/18	2350	µS/cm
PO-300	Stock Pond	Conductivity	10/23/18	2230	µS/cm
PO-300	Stock Pond	Conductivity	2/7/19	2510	µS/cm
PO-300	Stock Pond	Conductivity	2/7/19	2430	µS/cm
PO-300	Stock Pond	Conductivity	2/7/19	3	µS/cm
PO-300	Stock Pond	Conductivity	5/23/19	1380	µS/cm
PO-300	Stock Pond	Conductivity	8/29/19	1250	µS/cm
PO-300	Stock Pond	Conductivity	8/29/19	1240	µS/cm
PO-300	Stock Pond	Conductivity	8/29/19	3	µS/cm
PO-304	Stock Pond	Conductivity	6/14/18	198	µS/cm
PO-305	Stock Pond	Conductivity	10/12/16	2240	µS/cm
PO-305	Stock Pond	Conductivity	2/24/17	241	µS/cm
PO-305	Stock Pond	Conductivity	2/24/17	238	µS/cm
PO-305	Stock Pond	Conductivity	2/24/17	0	µS/cm
PO-305	Stock Pond	Conductivity	5/25/17	2100	µS/cm
PO-305	Stock Pond	Conductivity	7/19/17	2120	µS/cm
PO-305	Stock Pond	Conductivity	10/11/17	2240	µS/cm
PO-305	Stock Pond	Conductivity	4/27/18	2010	µS/cm
PO-305	Stock Pond	Conductivity	6/14/18	1960	µS/cm
PO-305	Stock Pond	Conductivity	6/14/18	1960	µS/cm
PO-305	Stock Pond	Conductivity	6/14/18	0	µS/cm
PO-305	Stock Pond	Conductivity	9/15/18	2080	µS/cm
PO-305	Stock Pond	Conductivity	10/23/18	1930	µS/cm
PO-305	Stock Pond	Conductivity	2/7/19	2140	µS/cm
PO-305	Stock Pond	Conductivity	5/23/19	1910	µS/cm
PO-305	Stock Pond	Conductivity	5/23/19	1880	µS/cm

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
PO-305	Stock Pond	Conductivity	5/23/19	3	µS/cm
PO-305	Stock Pond	Conductivity	8/29/19	1810	µS/cm
PO-308	Stock Pond	Conductivity	5/23/19	459	µS/cm
SP-306	Spring	Conductivity	10/13/16	1510	µS/cm
SP-306	Spring	Conductivity	2/24/17	963	µS/cm
SP-306	Spring	Conductivity	5/25/17	1550	µS/cm
SP-306	Spring	Conductivity	7/19/17	4070	µS/cm
SP-306	Spring	Conductivity	4/27/18	1080	µS/cm
SP-306	Spring	Conductivity	4/27/18	1080	µS/cm
SP-306	Spring	Conductivity	6/14/18	955	µS/cm
SP-306	Spring	Conductivity	9/14/18	2390	µS/cm
SP-306	Spring	Conductivity	10/24/18	1420	µS/cm
SP-306	Spring	Conductivity	2/7/19	1710	µS/cm
SP-306	Spring	Conductivity	5/23/19	925	µS/cm
SP-306	Spring	Conductivity	8/29/19	1640	µS/cm
WA-215	Well	Conductivity	9/14/17	2350	µS/cm
WD-195	Well	Conductivity	9/14/18	2520	µS/cm
WD-211	Well	Conductivity	5/7/18	2910	µS/cm
WD-211	Well	Conductivity	9/20/19	2970	µS/cm
WD-212	Well	Conductivity	12/17/18	1900	µS/cm
WD-216	Well	Conductivity	2/23/17	3050	µS/cm
WD-216	Well	Conductivity	5/17/17	2840	µS/cm
WD-216	Well	Conductivity	12/18/17	2840	µS/cm
WD-216	Well	Conductivity	5/5/18	2930	µS/cm
WD-216	Well	Conductivity	6/15/18	3310	µS/cm
WD-216	Well	Conductivity	9/14/18	2950	µS/cm
WD-216	Well	Conductivity	12/18/18	2820	µS/cm
WD-216	Well	Conductivity	2/13/19	2810	µS/cm
WD-216	Well	Conductivity	9/13/19	3080	µS/cm
WD-217	Well	Conductivity	5/16/17	2350	µS/cm
WD-217	Well	Conductivity	9/14/17	2440	µS/cm
WD-217	Well	Conductivity	12/18/17	2410	µS/cm
WD-217	Well	Conductivity	5/7/18	2560	µS/cm
WD-217	Well	Conductivity	6/15/18	2520	µS/cm
WD-217	Well	Conductivity	9/13/18	2460	µS/cm
WD-217	Well	Conductivity	12/17/18	2430	µS/cm
WD-217	Well	Conductivity	2/14/19	2330	µS/cm
WD-217	Well	Conductivity	9/13/19	2700	µS/cm
WM-213	Well	Conductivity	2/23/17	3310	µS/cm

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
WM-213	Well	Conductivity	5/17/17	3110	µS/cm
WM-213	Well	Conductivity	12/18/17	3010	µS/cm
WM-213	Well	Conductivity	5/5/18	3040	µS/cm
WM-213	Well	Conductivity	6/15/18	3010	µS/cm
WM-213	Well	Conductivity	9/14/18	3090	µS/cm
WM-213	Well	Conductivity	12/17/18	2900	µS/cm
WM-213	Well	Conductivity	2/13/19	2920	µS/cm
WM-213	Well	Conductivity	9/13/19	3220	µS/cm
WM-214	Well	Conductivity	2/24/17	2560	µS/cm
WM-214	Well	Conductivity	5/16/17	2560	µS/cm
WM-214	Well	Conductivity	12/18/17	2620	µS/cm
WM-214	Well	Conductivity	5/7/18	2740	µS/cm
WM-214	Well	Conductivity	6/15/18	2690	µS/cm
WM-214	Well	Conductivity	9/13/18	3910	µS/cm
WM-214	Well	Conductivity	12/18/18	2500	µS/cm
WM-214	Well	Conductivity	2/14/19	2500	µS/cm
WM-214	Well	Conductivity	9/20/19	2800	µS/cm
WO-173	Well	Conductivity	9/23/19	5280	µS/cm
WO-196	Well	Conductivity	2/23/17	4090	µS/cm
WO-196	Well	Conductivity	5/17/17	4100	µS/cm
WO-196	Well	Conductivity	9/14/17	4100	µS/cm
WO-196	Well	Conductivity	12/18/17	3950	µS/cm
WO-196	Well	Conductivity	5/5/18	4210	µS/cm
WO-196	Well	Conductivity	6/15/18	4150	µS/cm
WO-196	Well	Conductivity	9/14/18	3920	µS/cm
WO-196	Well	Conductivity	12/17/18	3830	µS/cm
WO-196	Well	Conductivity	2/13/19	3690	µS/cm
WO-196	Well	Conductivity	6/3/19	3520	µS/cm
WO-196	Well	Conductivity	9/13/19	4400	µS/cm
WO-197	Well	Conductivity	2/24/17	1850	µS/cm
WO-197	Well	Conductivity	5/16/17	1830	µS/cm
WO-197	Well	Conductivity	9/14/17	1810	µS/cm
WO-197	Well	Conductivity	12/18/17	1770	µS/cm
WO-197	Well	Conductivity	5/7/18	1840	µS/cm
WO-197	Well	Conductivity	6/15/18	1770	µS/cm
WO-197	Well	Conductivity	9/13/18	1590	µS/cm
WO-197	Well	Conductivity	12/17/18	1670	µS/cm
WO-197	Well	Conductivity	2/14/19	1670	µS/cm
WO-197	Well	Conductivity	6/3/19	1520	µS/cm

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
WO-197	Well	Conductivity	9/20/19	1870	µS/cm
WR-125	Well	Conductivity	9/14/18	2600	µS/cm
WR-136	Well	Conductivity	9/14/17	3500	µS/cm
WR-173	Well	Conductivity	9/23/19	1810	µS/cm
WR-247	Well	Conductivity	2/23/17	2860	µS/cm
WR-247	Well	Conductivity	5/17/17	2740	µS/cm
WR-247	Well	Conductivity	9/14/17	2780	µS/cm
WR-247	Well	Conductivity	12/18/17	2720	µS/cm
WR-247	Well	Conductivity	5/5/18	2820	µS/cm
WR-247	Well	Conductivity	6/15/18	2780	µS/cm
WR-247	Well	Conductivity	9/14/18	2750	µS/cm
WR-247	Well	Conductivity	12/18/18	2660	µS/cm
WR-247	Well	Conductivity	2/13/19	2610	µS/cm
WR-247	Well	Conductivity	2/13/19	2610	µS/cm
WR-247	Well	Conductivity	6/3/19	2600	µS/cm
WR-247	Well	Conductivity	9/13/19	2970	µS/cm
WR-248	Well	Conductivity	2/24/17	2410	µS/cm
WR-248	Well	Conductivity	5/16/17	2350	µS/cm
WR-248	Well	Conductivity	9/14/17	2190	µS/cm
WR-248	Well	Conductivity	12/18/17	2260	µS/cm
WR-248	Well	Conductivity	5/7/18	2380	µS/cm
WR-248	Well	Conductivity	6/15/18	2370	µS/cm
WR-248	Well	Conductivity	9/13/18	2110	µS/cm
WR-248	Well	Conductivity	12/18/18	2160	µS/cm
WR-248	Well	Conductivity	2/14/19	2190	µS/cm
WR-248	Well	Conductivity	6/3/19	1850	µS/cm
WR-248	Well	Conductivity	9/20/19	1870	µS/cm

Table 18. Water quality data for SAR from March 2 through October 31.

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
15	Outfall	SAR	4/30/15	0.85	Ratio
15	Outfall	SAR	4/30/15	0.85	Ratio
19	Outfall	SAR	4/30/15	0.92	Ratio
19	Outfall	SAR	4/30/15	0.92	Ratio
22	Outfall	SAR	3/31/21	1.01	Ratio
22	Outfall	SAR	3/31/21	1.01	Ratio
BAL2011	Well	SAR	10/1/19	0.2	Ratio
BAL2321	Well	SAR	10/1/19	1.2	Ratio
BGDSG	Spring	SAR	9/9/19	1.1	Ratio
BGDSG	Spring	SAR	9/9/19	0.9	Ratio
BGDSG	Spring	SAR	9/9/19	0.01	Ratio
BMC114	Well	SAR	10/1/19	1.3	Ratio
BMC214	Well	SAR	9/22/19	5.0	Ratio
BOV112	Well	SAR	10/1/19	0.5	Ratio
BOV212	Well	SAR	9/22/19	2.5	Ratio
BRC113	Well	SAR	10/1/19	1.2	Ratio
BRC213	Well	SAR	9/22/19	6.4	Ratio
BRC9163	Well	SAR	9/24/19	24.6	Ratio
BSM115	Well	SAR	10/1/19	3.4	Ratio
BSM215	Well	SAR	9/22/19	4.2	Ratio
BSP9976	Well	SAR	10/8/19	3.5	Ratio
PO-011	Sediment Pond	SAR	6/12/17	0.75	Ratio
PO-013	Sediment Pond	SAR	6/12/17	3.17	Ratio
PO-013	Sediment Pond	SAR	6/12/17	3.09	Ratio
PO-013	Sediment Pond	SAR	6/12/17	0.01	Ratio
PO-019	Sediment Pond	SAR	6/12/17	0.98	Ratio
PO-019A	Sediment Pond	SAR	6/12/17	0.46	Ratio
PO-026	Sediment Pond	SAR	6/12/17	0.96	Ratio
PO-046	Sediment Pond	SAR	6/12/17	1.07	Ratio
PO-137	Sediment Pond	SAR	6/12/17	1.65	Ratio
PO-21C	Sediment Pond	SAR	6/12/17	0.61	Ratio
PO-300	Stock Pond	SAR	10/25/16	26.7	Ratio
PO-300	Stock Pond	SAR	10/25/16	25.1	Ratio
PO-300	Stock Pond	SAR	10/25/16	0.10	Ratio
PO-300	Stock Pond	SAR	6/12/17	25.4	Ratio
PO-300	Stock Pond	SAR	8/2/17	31.8	Ratio
PO-300	Stock Pond	SAR	8/2/17	29.8	Ratio
PO-300	Stock Pond	SAR	8/2/17	0.01	Ratio

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
PO-300	Stock Pond	SAR	10/23/17	37.7	Ratio
PO-300	Stock Pond	SAR	10/23/17	37.1	Ratio
PO-300	Stock Pond	SAR	10/23/17	0.01	Ratio
PO-300	Stock Pond	SAR	5/10/18	22.7	Ratio
PO-300	Stock Pond	SAR	6/28/18	12.2	Ratio
PO-300	Stock Pond	SAR	10/1/18	20.2	Ratio
PO-300	Stock Pond	SAR	5/30/19	10.2	Ratio
PO-300	Stock Pond	SAR	9/3/19	12.1	Ratio
PO-300	Stock Pond	SAR	9/3/19	11.4	Ratio
PO-300	Stock Pond	SAR	9/3/19	0.01	Ratio
PO-304	Stock Pond	SAR	6/28/18	0.09	Ratio
PO-305	Stock Pond	SAR	10/25/16	1.32	Ratio
PO-305	Stock Pond	SAR	3/2/17	0.45	Ratio
PO-305	Stock Pond	SAR	3/2/17	0.44	Ratio
PO-305	Stock Pond	SAR	3/2/17	0.10	Ratio
PO-305	Stock Pond	SAR	6/7/17	1.41	Ratio
PO-305	Stock Pond	SAR	8/2/17	1.58	Ratio
PO-305	Stock Pond	SAR	10/23/17	1.59	Ratio
PO-305	Stock Pond	SAR	5/10/18	1.32	Ratio
PO-305	Stock Pond	SAR	6/28/18	1.39	Ratio
PO-305	Stock Pond	SAR	6/28/18	1.39	Ratio
PO-305	Stock Pond	SAR	6/28/18	0.01	Ratio
PO-305	Stock Pond	SAR	10/1/18	1.58	Ratio
PO-305	Stock Pond	SAR	5/30/19	1.38	Ratio
PO-305	Stock Pond	SAR	5/30/19	1.37	Ratio
PO-305	Stock Pond	SAR	5/30/19	0.01	Ratio
PO-305	Stock Pond	SAR	9/3/19	1.65	Ratio
PO-308	Stock Pond	SAR	5/30/19	0.05	Ratio
SP-306	Spring	SAR	10/18/16	1.39	Ratio
SP-306	Spring	SAR	3/6/17	1.06	Ratio
SP-306	Spring	SAR	6/12/17	1.86	Ratio
SP-306	Spring	SAR	8/4/17	4.11	Ratio
SP-306	Spring	SAR	5/7/18	0.89	Ratio
SP-306	Spring	SAR	5/7/18	0.89	Ratio
SP-306	Spring	SAR	6/28/18	1.18	Ratio
SP-306	Spring	SAR	10/1/18	2.18	Ratio
SP-306	Spring	SAR	10/31/18	2.1	Ratio
SP-306	Spring	SAR	5/31/19	1.4	Ratio
SP-306	Spring	SAR	9/3/19	2.5	Ratio

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
WA-215	Well	SAR	9/25/17	1.64	Ratio
WD-195	Well	SAR	9/26/18	2.51	Ratio
WD-211	Well	SAR	5/18/18	13.6	Ratio
WD-211	Well	SAR	10/1/19	13.6	Ratio
WD-216	Well	SAR	3/6/17	25.2	Ratio
WD-216	Well	SAR	5/30/17	33.2	Ratio
WD-216	Well	SAR	5/15/18	27.4	Ratio
WD-216	Well	SAR	6/29/18	13.8	Ratio
WD-216	Well	SAR	9/26/18	35.9	Ratio
WD-216	Well	SAR	9/22/19	37.1	Ratio
WD-217	Well	SAR	5/24/17	5.84	Ratio
WD-217	Well	SAR	9/25/17	6.89	Ratio
WD-217	Well	SAR	5/18/18	11.9	Ratio
WD-217	Well	SAR	6/29/18	11.4	Ratio
WD-217	Well	SAR	9/26/18	3.83	Ratio
WD-217	Well	SAR	9/22/19	12.6	Ratio
WM-213	Well	SAR	3/2/17	10.7	Ratio
WM-213	Well	SAR	5/30/17	21.6	Ratio
WM-213	Well	SAR	5/15/18	33.1	Ratio
WM-213	Well	SAR	6/29/18	32.7	Ratio
WM-213	Well	SAR	9/26/18	34.5	Ratio
WM-213	Well	SAR	9/22/19	34.5	Ratio
WM-214	Well	SAR	5/24/17	3.76	Ratio
WM-214	Well	SAR	5/18/18	4.00	Ratio
WM-214	Well	SAR	6/29/18	3.91	Ratio
WM-214	Well	SAR	9/26/18	6.88	Ratio
WM-214	Well	SAR	10/1/19	4.0	Ratio
WO-173	Well	SAR	10/8/19	3.8	Ratio
WO-196	Well	SAR	5/30/17	2.28	Ratio
WO-196	Well	SAR	9/26/17	2.17	Ratio
WO-196	Well	SAR	5/17/18	2.35	Ratio
WO-196	Well	SAR	6/29/18	2.27	Ratio
WO-196	Well	SAR	9/26/18	2.25	Ratio
WO-196	Well	SAR	6/21/19	2.5	Ratio
WO-196	Well	SAR	9/22/19	2.2	Ratio
WO-197	Well	SAR	6/5/17	0.76	Ratio
WO-197	Well	SAR	9/26/17	0.76	Ratio
WO-197	Well	SAR	5/18/18	1.78	Ratio
WO-197	Well	SAR	6/29/18	0.90	Ratio

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
WO-197	Well	SAR	10/1/18	0.86	Ratio
WO-197	Well	SAR	6/21/19	0.9	Ratio
WO-197	Well	SAR	10/1/19	1.1	Ratio
WR-125	Well	SAR	9/26/18	2.01	Ratio
WR-136	Well	SAR	9/25/17	2.24	Ratio
WR-173	Well	SAR	10/8/19	1.9	Ratio
WR-247	Well	SAR	3/2/17	7.79	Ratio
WR-247	Well	SAR	5/30/17	8.38	Ratio
WR-247	Well	SAR	9/25/17	7.47	Ratio
WR-247	Well	SAR	5/17/18	7.18	Ratio
WR-247	Well	SAR	6/29/18	7.06	Ratio
WR-247	Well	SAR	9/26/18	7.11	Ratio
WR-247	Well	SAR	6/21/19	5.9	Ratio
WR-247	Well	SAR	9/22/19	6.9	Ratio
WR-248	Well	SAR	5/24/17	2.36	Ratio
WR-248	Well	SAR	9/26/17	1.62	Ratio
WR-248	Well	SAR	5/18/18	1.66	Ratio
WR-248	Well	SAR	6/29/18	1.61	Ratio
WR-248	Well	SAR	10/1/18	1.63	Ratio
WR-248	Well	SAR	6/21/19	2.0	Ratio
WR-248	Well	SAR	10/1/19	1.6	Ratio

Table 19. Water quality data for SAR from November 1 through March 1.

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
26	Outfall	SAR	1/31/20	1.3	Ratio
129	Outfall	SAR	1/31/20	1.88	Ratio
129	Outfall	SAR	2/29/20	1.79	Ratio
PO-300	Stock Pond	SAR	11/5/18	19.2	Ratio
PO-300	Stock Pond	SAR	2/22/19	18.8	Ratio
PO-300	Stock Pond	SAR	2/22/19	18.8	Ratio
PO-300	Stock Pond	SAR	2/22/19	0.01	Ratio
PO-305	Stock Pond	SAR	11/5/18	1.43	Ratio
PO-305	Stock Pond	SAR	2/22/19	1.41	Ratio
SP-306	Spring	SAR	2/22/19	1.7	Ratio
WD-212	Well	SAR	12/31/18	30.4	Ratio
WD-216	Well	SAR	12/29/17	35.4	Ratio
WD-216	Well	SAR	1/2/19	35.6	Ratio
WD-216	Well	SAR	2/22/19	39.1	Ratio
WD-217	Well	SAR	12/29/17	8.45	Ratio
WD-217	Well	SAR	12/31/18	12.0	Ratio
WD-217	Well	SAR	3/1/19	11.8	Ratio
WM-213	Well	SAR	12/29/17	31.1	Ratio
WM-213	Well	SAR	12/31/18	32.6	Ratio
WM-213	Well	SAR	2/22/19	34.6	Ratio
WM-214	Well	SAR	3/1/17	2.94	Ratio
WM-214	Well	SAR	12/29/17	3.76	Ratio
WM-214	Well	SAR	1/2/19	3.7	Ratio
WM-214	Well	SAR	3/1/19	3.7	Ratio
WO-196	Well	SAR	3/1/17	2.20	Ratio
WO-196	Well	SAR	12/29/17	2.16	Ratio
WO-196	Well	SAR	12/31/18	2.2	Ratio
WO-196	Well	SAR	2/22/19	2.2	Ratio
WO-197	Well	SAR	3/1/17	0.75	Ratio
WO-197	Well	SAR	12/29/17	0.80	Ratio
WO-197	Well	SAR	12/31/18	0.9	Ratio
WO-197	Well	SAR	3/1/19	0.9	Ratio
WR-247	Well	SAR	12/29/17	7.29	Ratio
WR-247	Well	SAR	1/2/19	6.6	Ratio
WR-247	Well	SAR	2/22/19	6.9	Ratio
WR-247	Well	SAR	2/22/19	6.9	Ratio
WR-248	Well	SAR	3/1/17	1.99	Ratio
WR-248	Well	SAR	12/29/17	1.93	Ratio

Outfall/ Monitoring Site	Site Type	Parameter	Monitoring Period End Date or Analysis Date	Values	Units
WR-248	Well	SAR	1/2/19	1.5	Ratio
WR-248	Well	SAR	2/28/19	1.6	Ratio

APPENDIX E. Estimated Effluent Characteristics

The permittee must provide quantitative data on certain pollutants in the effluent (ARM 17.30.1322). This information is used to determine if water quality-based effluent limitations, in addition to the TBELs described in Section 2.1, are necessary. Effluent characterization is based on the daily discharge data for the effluent which is summarized as monthly average and daily maximum values (ARM 17.30.1304). For new facilities, pollutant concentrations may be estimated.

Critical Effluent Pollutant Concentration (C_d)

When quantitatively determining reasonable potential and assessing the need for a WQBEL, DEQ typically estimates C_d based on the 95th percentile of the expected effluent concentration following the procedure described in Chapter 3 of U.S. EPA’s *Technical Support Document for Water Quality Based Toxic Control*, EPA/505/2-60-001, March 1991 (TSD). Given the large sample size of the data provided by the applicant, C_d was determined from the actual concentration corresponding to the 95th percentile of the dataset. Table 20 provides C_{d(95)} for EC and SAR which are the parameters requiring RPA.

Table 20. Critical effluent pollutant concentration (C_d) for the parameters requiring RPA.

Parameter	Units	Count of Samples	Maximum Effluent Concentration (C _{d(max)})	95 th Percentile Effluent Concentration (C _{d(95)})
Electrical Conductivity (EC)	µS/cm	176	5720	4092
Sodium Adsorption Ratio (SAR) ⁽¹⁾	Ratio	137	37.7	33.3
Sodium Adsorption Ratio (SAR) ⁽²⁾	Ratio	40	39.1	35.6
Footnotes:				
(1) The water quality standard applies to March 2 through October 31 and water quality data for that period was used in the analysis.				
(2) The water quality standard applies to November 1 through March 1 and water quality data for that period was used in the analysis.				

Critical Effluent Flow (Q_d)

Effluent flow is a measure of the average daily flow expected to occur over the next 5-year permit cycle or effective life of the regulated facility or activity. For facilities other than publicly owned treatment works, the critical flow is based on the reported average daily flow of the maximum 30-day (monthly) average flow reported on the permit application. Effluent flow is expressed as gallons per day (GPD) or million gallons per day (MGD). For this new discharge, the projected maximum flow is the critical effluent flow. Future permit renewals may use the reported maximum 30-day average or daily maximums from actual discharge data.

APPENDIX F. Reasonable Potential Analysis

When determining the need for WQBELs, DEQ uses estimates of critical effluent concentration and flow and the design conditions of the receiving water after accounting for any mixing zone. The resulting instream pollutant concentration is compared to the applicable numeric and narrative water quality standard or nondegradation criterion. For purposes of assessing the need for and calculating WQBELs, DEQ primarily uses the mass-balance equation provide in Section 2.2.8. The mass balance equation assumes steady-state conditions of discharge and receiving water, rapid and complete mixing, and is based on the design condition of the receiving water. The mass-balance equation is used to determine the concentration of a pollutant after accounting for the dilution provided by a mixing zone. The mass-balance equation can be arranged to solve for the resulting instream pollutant concentration (C_r) in the receiving water after accounting for dilution and other sources of pollution.

$$C_r = (Q_s C_s + Q_d C_d) / (Q_r)$$

Where:

- C_r = resultant in-stream pollutant concentration
- Q_s = critical stream design flow at point of discharge
- C_s = critical receiving water pollutant concentration
- Q_d = critical effluent flow
- C_d = critical effluent pollutant concentration
- Q_r = resultant in-stream flow after discharge ($Q_r = Q_s + Q_d$)

When the receiving water is an ephemeral stream, as defined at ARM 17.30.602(10), then $Q_s = 0$ and $C_d = C_r$.

Where C_r exceeds the lowest applicable water quality standard for the parameter of concern, there is reasonable potential and WQBELs must be calculated.

DEQ may also perform a narrative reasonable potential analysis based on the stringency of the nonsignificance criteria and/or where effluent concentrations provided by the permittee are estimates rather than actual effluent monitoring data.

RPA results are given in Table 21, below, and are discussed in Section 2.2.8.

Table 21. RPA results for EC and SAR using $C_{d(95)}$

Parameter	Units	Water Quality Standard	Critical Effluent Concentration ($C_{d(95)}$)	Critical Background Receiving Water Concentration (C_s)	Critical Stream Flow	Projected Receiving Water Concentration (C_r)	WQBEL Needed?
Electrical Conductivity (EC)	$\mu\text{S}/\text{cm}$	500	4092	NA	0	4092	Yes
Sodium Adsorption Ratio (SAR) ⁽¹⁾	Ratio	3.0	33.3	NA	0	33.3	Yes
Sodium Adsorption Ratio (SAR) ⁽²⁾	Ratio	5.0	35.6	NA	0	35.6	Yes
Footnotes:							
(1) The water quality standard applies to March 2 through October 31 and water quality data for that period was used in the analysis.							
(2) The water quality standard applies to November 1 through March 1 and water quality data for that period was used in the analysis.							

APPENDIX G. Waste Load Allocations (WLA) And Effluent Limitations

The pollutants identified in Appendix F as having RP are harmful parameters pursuant to ARM 17.30.670(5). As such, the final WQBELs for EC and SAR were set equal to the water quality standards provided at ARM 17.30.670(4) for tributaries to Rosebud Creek.