STATEMENT OF BASIS

PERMITTEE:	Crow Indian Tribe, Crow Reservation
FACILITY:	Crow Municipal Rural & Industrial (MR&I) Pilot Water Treatment Plant
RESPONSIBLE OFFICIAL:	Titus Takes Gun, Director Crow Tribe Water Resources Department (CTWRD) 189 Heritage Road, Crow Agency, MT 59022
FACILITY CONTACT:	Titus Takes Gun, Director CTWRD 189 Heritage Road, Crow Agency, MT 59022 406-638-4228
PERMIT NO.:	MT0031827
RECEIVING WATERS:	Bighorn River
LOCATION OF FACILITY:	NE ¼ Section 23, Township 4S, Range 32E 45.472222º N, 107.739447º W
LOCATION OF DISCHARGE:	NW ¼, NW ¼ Section 23, Township 4S, Range 32E 45.473172º N, 107.741347º W
PERMIT TYPE	Indian County, Minor, First Issued Permit

A. Background Information

This Statement of Basis is for the National Pollutant Discharge Elimination System (NPDES) permit (the Permit) for the discharge from Crow Indian Tribe's Municipal Rural & Industrial (MR&I) Pilot Water Treatment Plant (Plant). The Plant is a new pilot potable water treatment plant. Construction of the Plant is expected to commence in early 2015 and the location of the Plant will be, at or near 45.472222º N, 107.739447º W, within the town of St. Xavier, Montana.

The Plant is the preliminary testing facility for the ultimate drinking water supply and distribution system (called the MR&I Water System) for residents and communities of the Crow Indian Reservation. The MR&I Water System will include the construction on a new distribution system and new full scale water treatment plant. The Plant will test various water treatment processes/treatment systems to determine the appropriate design criteria for a full scale MR&I water treatment plant. It is anticipated that the Plant will operate for approximately 130 non-consecutive days spanning a 6 month period while information and data can be collected for the full scale MR&I water treatment plant.

Construction of the new distribution system will be phased over a period of 10 to 15 years with the full scale water treatment plant being operable within 4 to 5 years. The full scale water treatment plant is not currently covered under this NPDES permit. A separate NPDES permit or

modification to this Permit will be required to include the full scale water treatment plant in the future.

EPA is issuing this permit pursuant to the Agency's authority to implement the Clean Water Act NPDES program in Indian Country. This is the first issued NPDES permit for this facility.

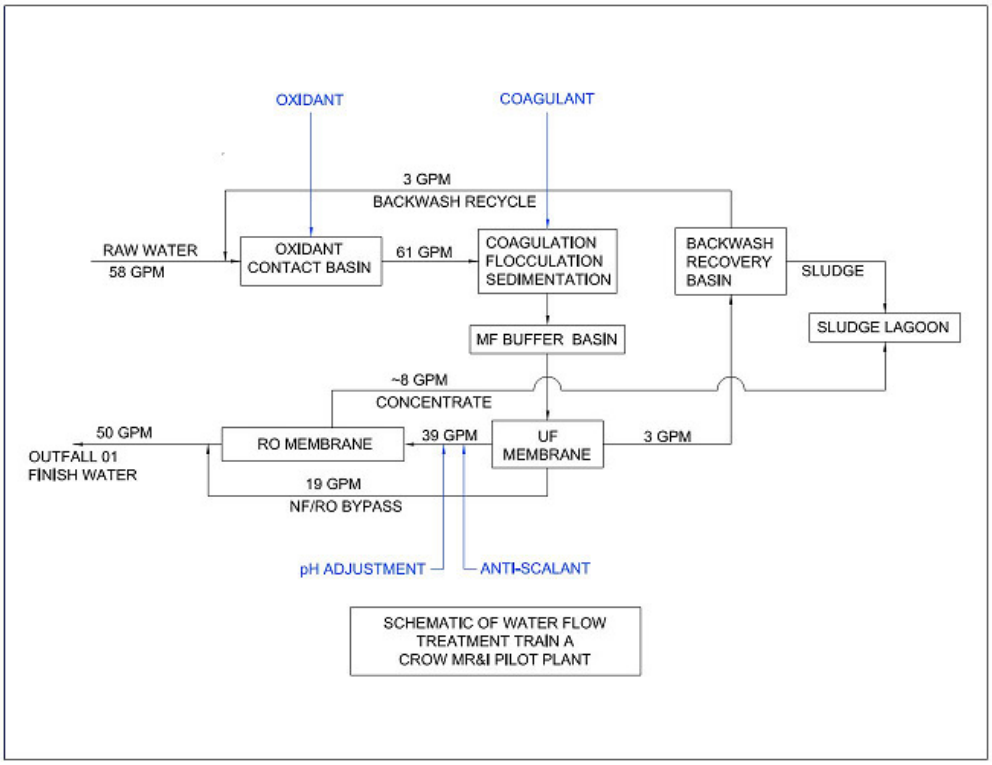
B. Facility/Process Description

The Plant will be constructed, at or near, 45.472222º N, 107.739447º W in St. Xavier, Montana on the Crow Indian Reservation. The Plant is planned to be manned five days per week during the approximately 6 months of testing.

Surface water from the Bighorn River will be the source water for the Plant until a test intake well can be drilled to intercept groundwater (under the influence of surface water) and be tested as a supply of possible source water. Two treatment trains (A and B) will be tested in parallel on an intermittent basis depending on the performance and operational factors.

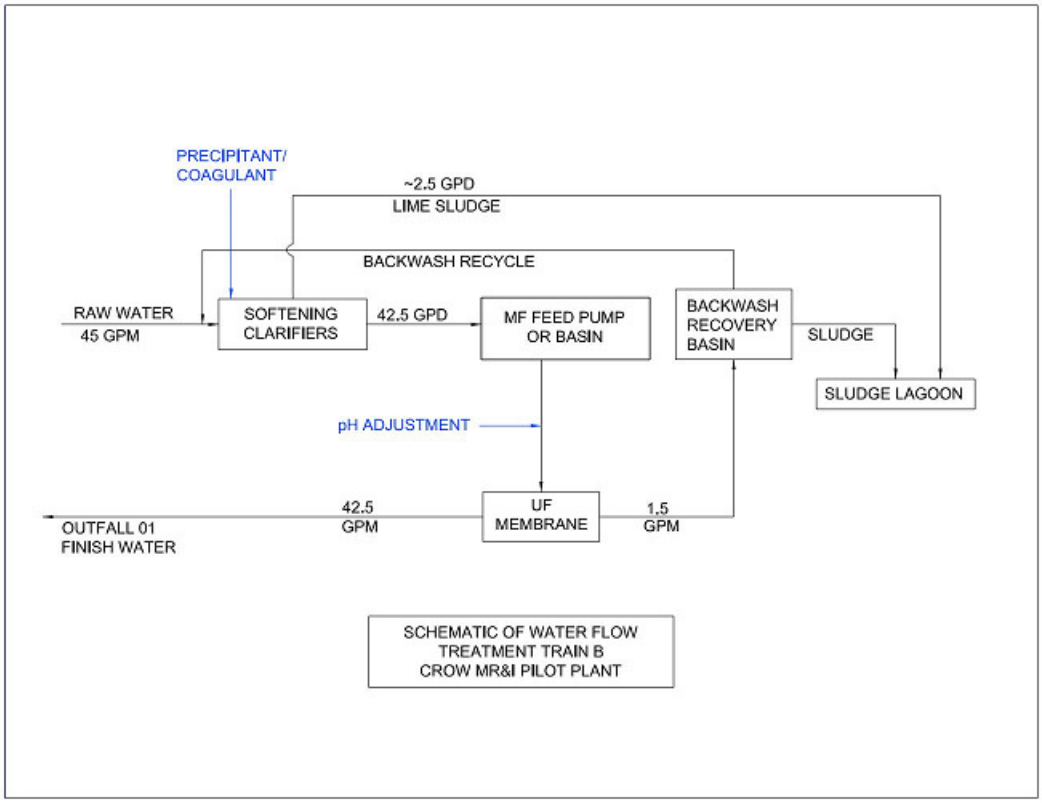
Treatment train A is proposed to include the addition of an oxidant to the raw water in a contact basin, coagulation, flocculation, and sedimentation (potentially with plate settlers or in a basin), microfiltration/ultrafiltration (MF/UF) membrane filtration followed by reverse osmosis (RO) or Nanofiltration (NF) membranes (see Figure 1). The sludge, RO concentrate/brine, and all filtration backwash will be placed in the facility's sludge lagoon.

Figure 1



Treatment train B is proposed to consist of high rate softening potentially with the addition of an oxidant or coagulant, followed by pH adjustment to decrease the pH before entering the MF/UF membranes (see Figure 2). The sludge and filtration backwash will be placed in the facility's sludge lagoon.

Figure 2



The chemicals and that could be used in treatment trains A and B include the following:

Chemical Oxidation	**Injection Location**
Ozone	Oxidant Contact Basin
Chlorine	Oxidant Contact Basin
Chlorine Dioxide	Oxidant Contact Basin
Potassium Permanganate	Oxidant Contact Basin
Sodium Hypochlorite	Oxidant Contact Basin

Precipitant/Coagulant/Flocculate	**Injection Location**
Alum	Prior to Sedimentation Basin
Ferric chloride	Prior to Sedimentation Basin

Precipitation/Softening	**Injection Location**
Soda Ash	Prior to Softening Clarifier
Lime	Prior to Softening Clarifier
Caustic Soda	Prior to Softening Clarifier

pH Adjustment/Carbonation	**Injection Location**
Carbon Dioxide	Prior to MF/UF or RO
Caustic Soda	Prior to MF/UF or RO
Anti-Scalant	Prior to RO Membrane

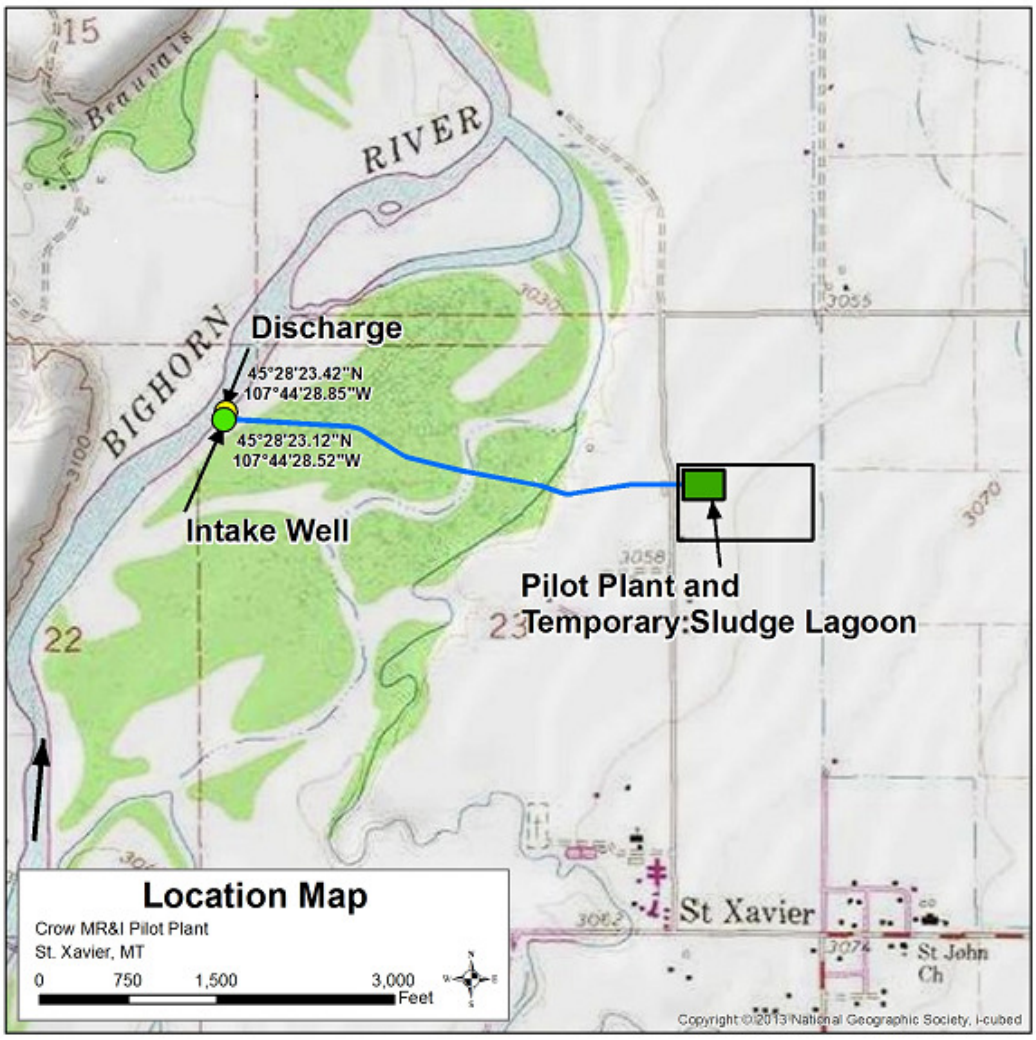
All disinfectant testing will be done on side streams or via jar testing. This water will be routed to the facility's sludge lagoon for disposal.

Wastestreams from the water treatment processes include jar testing wastewater, side stream testing wastewater, sediment/sludge, filter backwash wastewater, reverse osmosis concentrate/brine, and disinfectant testing wastewater. These wastestreams are to be routed to the facility's sludge lagoon and are not authorized to be discharged under this Permit. There will be no outlet/outfall from the sludge evaporation pond (e.g. total containment pond). Section 1.1.3. of the Permit requires weekly monitoring of the sludge lagoon to ensure that it is properly operated and maintained.

It is anticipated that the discharge of the finished water to the Bighorn River through Outfall 001 will be intermittent for approximately 6 months of testing. The average daily flow rate is estimated to be approximately 84,000 gallons per day, with a maximum flow rate of 86,400 gallons per day. Finished water from the Plant will be pumped or gravity fed to Outfall 001 (see Figure 3). The Permit only authorizes the finished water from the treatment process to be discharged through Outfall 001. Outfall 001 is anticipated to be located, at or near, 45.473172º N, 107.741347º W on the Bighorn River.

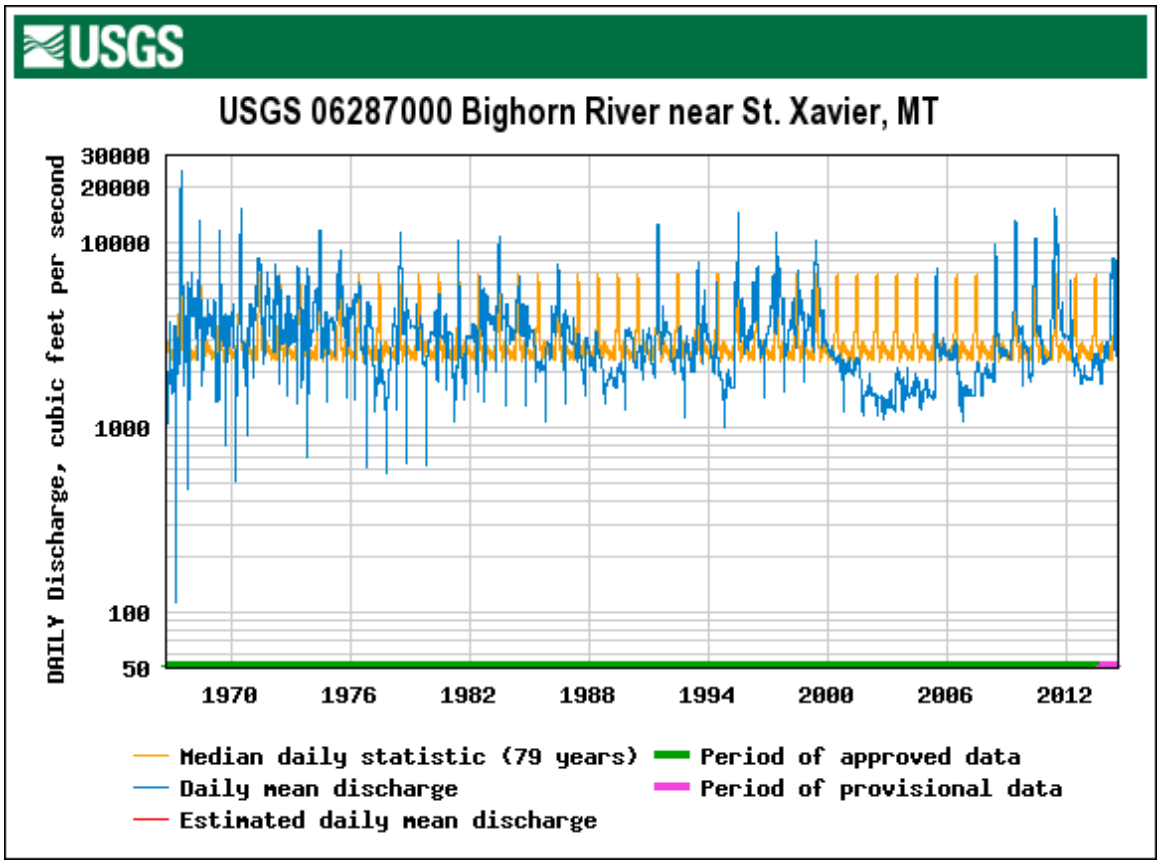
Domestic waste from the Plant will be handled either by a port-a-potty or the existing Crow/St. Xavier Community Center of which the Plant is planned to be located adjacent to.

Figure 3



C. Receiving Waters

The Plant will discharge to the Bighorn River, at or near, 45.473172º N, 107.741347º W. The USGS Gaging station (06287000) located on the river just below the diversion to the Bighorn Canal shows a year round high flow rate in the river. The proposed discharge from the Plant would be very negligible to the river due a high dilution ratio.



D. Water Quality Considerations

The Crow Tribe does not have Tribal-adopted nor EPA-approved water quality standards at the time of Permit issuance. However, the Crow Tribe is currently developing standards and have submitted various drafts to EPA, the drafts are unapproved and do not contain standards specific to any water body at this time.

Aquatic life could be adversely affected by the aluminum, iron and total residual chlorine (TRC) in the discharge based upon the proposed chemical to be used and the proposed treatment processes. EPA's recommended aquatic life criteria for aluminum (as total recoverable aluminum) are 750 µg/l (0.750 mg/l) for acute toxicity and 87 µg/l (0.087 mg/l) for chronic toxicity. EPA's recommended aquatic life criteria for iron are 1,000 µg/l (1.0 mg/l) for chronic toxicity. The recommended national water quality criterion is 19 µg/l (0.019 mg/l) TRC for acute toxicity and 11 µg/l (0.011 mg/l) TRC for chronic toxicity.

Per EPA's Technical Support Document for Water Quality-based Toxics Control, March 1991, where there is a dilution ratio ≥ 1,000:1, the testing recommendations should be for acute testing only as chronic toxicity will likely not to be present at that high dilution ratio. The dilution ratio for this facility is approximately 23,000:1 (i.e., 3,000 cfs: 0.13 cfs). Therefore, no chronic toxicity effluent limit will be applied for TRC. Additionally, there will be no mixing zone/dilution allowance for acute TRC toxicity. Therefore, the acute TRC effluent limitation will apply end-of-pipe.

Monitoring will be required for aluminum and iron due to the proposed use of ferric chloride and alum in the water treatment process. If toxicity is found to be present for either chemical at or near EPA's recommended aquatic life criteria listed above, the permit may be opened and effluent limitations for these pollutants may be added.

E. Effluent Limitations

The Plant is only authorized to discharge finished water that is close to or within potable water treatment standards. No process wastewater from the Plant is authorized to be discharged under this Permit.

There are no effluent limitation guidelines that apply to the discharge covered by this Permit. Accordingly, the technology based effluent limitations are based on best professional judgment (BPJ) as provided for in Section 402(a)(1) of the Clean Water Act. There will be no mixing zone/dilution allowance allowed since all the effluent limitations in this Permit are either technology-based (BPJ) or are for acute TRC toxicity which does not allow for a mixing zone/dilution allowance. For purposes of BPJ, the EPA Region 8 policy on effluent limitations for potable water treatment plants is a TSS effluent limitation of 30/45 mg/L and a pH limit of 6.0-9.0 s.u.

The effluent limitations and the basis for the limitations are given in the table below for Outfall 001.

Effluent Characteristic	30-Day Average a/	Daily Maximum a/	Basis
Total Suspended Solids, mg/L	30	45	40 CFR § 133.102(b)
Total Residual Chlorine, mg/L, b/	N/A	0.019	BPJ
The pH of the discharge shall not be less than 6.0 or greater than 9.0 at any time.			40 CFR § 133.102(c)
There shall be no discharge of floating solids or visible foam in other than trace amounts. There shall be no discharge which causes a visible oil sheen in the receiving water.			BPJ, 40 CFR § 110.3
There shall be no discharge of any wastewater from the water treatment process. This includes, but is not limited to, jar testing wastewater, side stream testing wastewater, sediment/sludge, filter backwash wastewater, reverse osmosis concentrate/brine, disinfectant testing wastewater, and sanitary wastewater.			BPJ

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

b/ For the purposes of the permit, the minimum limit of analytical reliability in the analysis for total residual chlorine is considered to be 0.05 mg/L. For purposes of calculating averages and reporting on the Discharge Monitoring Report form, analytical values less than 0.05 mg/L shall be considered zero.

Because of analytical limitations on monitoring for TRC, any monitoring value less than 0.05 mg/L will be considered as zero for purposes of permit compliance and reporting purposes. The 0.05 mg/L value is based on using the DPD Spectrophotometric method of analysis and 0.05 mg/L is considered the minimum detection limit for this analytical method. The permit requires that the permittee use an analytical procedure with a minimum detection level no greater than 0.05 mg/L.

F. Self-Monitoring Requirements

The following samples shall be taken from the outlet pipe from the Plant to the Bighorn River.

Effluent Characteristic	Frequency	Sample Type a/
Total flow, gpm b/	Monthly	Instantaneous
Total Suspended Solids, mg/L	Weekly	Grab
Total Residual Chlorine, mg/L	Weekly	Grab
Aluminum, Total Recoverable, mg/L	Weekly	Grab
Iron, Dissolved, mg/L	Weekly	Grab
pH, s.u.	Weekly	Grab or Instantaneous

a/ See Definitions, Part I.A. of the permit for definition of terms.

b/ Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained. The average flow rate during the reporting period and the maximum flow shall be reported**.**

G. Inspection Requirements

Part 1.3.3 of the permit requires the permittee to do weekly inspections of the sludge ponds. The inspection requirements include checking to see if a discharge is occurring, checking for leaks in the dikes, dike erosion, indications of animals burrowing in the dikes, and rooted plants growing in the ponds. Inspections may be delayed if weather conditions (e.g. lightening, icy footing, etc.) make it dangerous to conduct the inspection.

In addition to weekly inspections, the permittee is required to implement Best Management Practices (BMPs) to prevent excess sediment levels in the sludge ponds. The purpose of the BMPs are to keep the ponds from becoming too full of sediment and thus reduce their evaporation efficiency so that an overflow may occur. The BMPs consist of sediment depth measurements, which are to be taken three times a year (in March-April, June-August, and October-November). After the measurements are taken, the permittee is to make a determination if sediment should be removed from the ponds) before the next measurements are due to be taken. The sludge ponds should not be allowed to fill more than two-thirds ($^2/_3$) with sediment before sediment removal is done. Measurements in a sludge pond do not have to be taken if the sediment has been removed from that pond within the previous 45 days.

H. Total Maximum Daily Loads

On June 21, 2000 and September 21, 2000, U.S. District Judge Donald W. Molloy issued orders stating that until all necessary total maximum daily loads (TMDLs) under Section 303(d) of the Clean Water Act are established for a particular water quality limited segment, the EPA is prohibited from issuing new permits or from increasing already permitted discharges under the NPDES program. (The orders were issued pursuant to the lawsuit Friends of the Wild Swan, et al., v. U.S. EPA, CV 97-35-M-DWM, District of Montana, Missoula Division.)

EPA finds that the issuance of this permit would not conflict with the order because the receiving water is in Indian County. Furthermore, when EPA approved the State of Montana's 1996 and 1998 lists of impaired streams and lakes which included water bodies within tribal reservation boundaries, EPA specifically stated that the approval did not extend to waters within Indian County. The Crow Tribe has not adopted water quality standards and have not listed water bodies as impaired and developed a 303(d) list to require development of TMDLs. If a future load allocation is set for any parameter which could apply to the Plant, the permit contains a provision that would allow the permit to be reopened and modified to include any Waste Load Allocation developed and approved by the Crow Tribe and/or EPA.

I. Endangered Species Act Requirements

Section 7(a) [16 U.S.C. §1536(a)(2)] of the Endangered Species Act requires federal agencies to ensure that any actions authorized, funded, or carried out by an Agency are not likely to jeopardize the continued existence of any federally-listed endangered or threatened species or adversely modify or destroy critical habitat of such species. According to the U.S. Fish and Wildlife Service, Montana Field Office, internet site at http://www.fws.gov/mountain-prairie/mt.html lists the federally listed threatened, endangered and candidate species and proposed and designated critical habitat found on the Crow Reservation in Montana.

Table 3: Threatened, Endangered, and Candidate Species on the Crow Reservation

Common Name	Scientific Name	Status[1]	Habitat
Black-footed Ferret	*Mustela nigripes*	Endangered	Prairie dog complexes; Eastern Montana
Greater sage-grouse	*Centrocercus urophasianus*	Candidate	Eastern, central and southwestern Montana in sagebrush, sagebrush-grasslands, and associated agricultural lands
Sprague's Pipit	*Anthus spragueii*	Candidate	Grassland habitats with little or no shrub cover east of the Continental Divide

[1]ENDANGERED (E) - Any species that is in danger of extinction throughout all or a significant portion of its range. CANDIDATE (C) – Those taxa for which the U.S. Fish and Wildlife Service has sufficient information on biological status and threats to propose to list them as threatened or endangered. We encourage their consideration in environmental planning and partnerships, however, none of the substantive or procedural provisions of the Act apply to candidate species.

The EPA finds that this permit is not likely to Adversely Affect any of the species listed by the U. S. Fish and Wildlife Service under the Endangered Species Act due to the water quality of the discharge and the minimal volume being discharged.

J. National Historic Preservation Act (NHPA) Requirements

Section 106 of the National Historic Preservation Act (NHPA) [16 U.S.C. § 470(f)] requires that federal agencies consider the effects of federal undertakings on historic properties. EPA has evaluated its issuance of the NPDES permit for the Plant to assess this action's potential effects on any listed/eligible historic properties or cultural resources. EPA does not anticipate any impacts on listed/eligible historic properties or cultural resources because the Plant will not be associated with any ground disturbance on a listed historic property nor will its point of discharge. The only historic property in St. Xavier, Montana is the St. Xavier Mission Church and Rectory located at 45.463611º N, 107.727778º W which is approximately 2 mile away from the Plant and approximately 3 miles away from Outfall 001. The Tribal Historic Preservation Officer will also have an opportunity to comment on proposed location of the WTP and Outfall 001.

K. Miscellaneous

The permit was public noticed in the Big Horn County News on January 8, 2015. No comments were received during the public notice period.

The effective date for this permit will be March 1, 2015, and the expiration date of the permit will be February 29, 2020.

As a reminder to the Permittee at the time for renewal of this permit in 5 years, analyte testing for metals for all outfalls should occur and submitted as part of the application documentation. This specific testing should be for all analytes believed to be present in the discharge.