NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
DRAFT PERMIT FACT SHEET
September 2025

Permittee Name: U.S. Department of Energy Office of Legacy Management

Mailing Address: 2579 Legacy Way
Grand Junction, CO 81503

Facility Location: 0.75 miles east of U.S. Highway 491 via Uranium Boulevard Shiprock, San Juan County, New Mexico

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NPDES Permit No.: NN0031100

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I. STATUS OF PERMIT

The U.S. Department of Energy Office of Legacy Management (the "permittee", DOE) has applied for a new National Pollutant Discharge Elimination System (NPDES) permit to authorize the discharge of treated effluent from the Shiprock Water Treatment Unit (WTU) to the Bob Lee Wash and to the San Juan River located in San Juan County in northwestern New Mexico. A complete application was submitted on September 25, 2024. EPA Region 9 has developed this permit and fact sheet pursuant to Section 402 of the Clean Water Act (CWA), which requires point source dischargers to control the amount of pollutants that are discharged to waters of the United States through obtaining a NPDES permit.

Navajo Nation is a federally recognized Indian Tribe. Currently, EPA Region 9 retains the primary regulatory responsibility for administering the NPDES permitting program within Navajo Nation. The NPDES permit incorporates CWA requirements including EPA-approved Tribal water quality requirements.

DOE manages a Groundwater Compliance Action Plan for a former uranium and vanadium ore milling facility in Shiprock, New Mexico. DOE currently pumps groundwater with mill-related contaminants to a lined evaporation pond. A 2021 pond liner assessment showed multiple degradations and liner penetrations. DOE is proposing to decommission and remove the evaporation pond and replace the treatment capability of the pond with a new WTU that discharges effluent to the San Juan River (LMS 2024).

This permittee has been classified as a minor discharger.

II. SIGNIFICANT CHANGES TO PREVIOUS PERMIT

This is a new permit so there is no previous permit for comparison.

III. GENERAL DESCRIPTION OF FACILITY

The permittee's Shiprock WTU will be located on Uranium Boulevard about 0.75 miles east of U.S. Highway 491 in Shiprock, San Juan County, New Mexico, within the northern portion of the Navajo Nation. The facility is located on a terrace overlooking the San Juan River.

<u>Former Mill Facility</u>

Kerr-McGee Oil Industries, Inc. designed and built a uranium- and vanadium-ore processing facility in Shiprock which they operated from 1954 to 1963. The mill, ore storage, raffinate ponds, and tailings piles comprising the mill site occupied approximately 145 acres leased from the Navajo Nation. In 1963, Vanadium Corporation of America purchased and operated the mill facility. Vanadium Corporation of America merged with Foote Mineral

Company and continued operations until 1968. When the lease expired in 1973, control of the mill site reverted to the Navajo Nation.

The mill processed a total of about 1.5 million short tons of ore along with smaller quantities of bulk precipitates from heap leach operations and purchased vanadium liquor. A two-stage sulfuric acid leaching circuit, countercurrent washing circuit, and uranium and vanadium solvent extraction circuits were used. Tailings from the washing circuit and yellow cake filtrates were pumped to the tailing disposal areas, while raffinate from the solvent extract circuits was allowed to evaporate and infiltrate the ground from separate holding ponds. In 1983, DOE and the Navajo Nation entered into an agreement for site cleanup. Remedial action at the Shiprock site was completed by September 1986. Approximately 2.5 million tons of contaminated materials were stabilized in place in a disposal cell covering approximately 77 acres. The disposal cell and adjacent former mill site are on a terrace. A 50- to 60-foot escarpment separates the terrace from the San Juan River floodplain. The disposal cell is located about 600 feet from the San Juan River.

Groundwater Contamination

Past milling operations left contaminants in the terrace groundwater system and in the floodplain alluvial aquifer north of the disposal cell and terrace. The Shiprock groundwater is salty and has mill-related contaminants of concern such as ammonium, manganese, nitrate, selenium, strontium, sulfate, and uranium. The 2002 DOE Final Ground Water Compliance Action Plan described the strategies at the site for remediation of the terrace and floodplain areas. In 2002 and 2003, a groundwater remediation system was constructed. For the terrace, four groundwater extraction wells were installed along with groundwater intercept drains in the Bob Lee and Many Devils Washes. For the floodplain, two groundwater extraction wells were installed close to the San Juan River. The remediation system began full operation in March 2003. The treatment system was expanded in 2006 to include Trench 1 and Trench 2 extraction wells on the floodplain. Additionally, a seep collector drain was installed on the floodplain at the base of the escarpment. In late 2022, the interceptor drain at Many Devils Wash was decommissioned. Groundwater removed by the extraction wells and collected by the interceptor drains is pumped to an 11-acre lined pond on the terrace south of the disposal cell where removal of dissolved contaminants through natural evaporation occurs. In April 2017, extraction temporarily stopped at most treatment system locations. Currently, the remediation system is pumping up to approximately 40 gallons per minute (gpm). From 2003 to 2021, the total volume of groundwater pumped to the pond was 231,700,000 gallons.

In 2021, the permittee completed a comprehensive pond liner assessment which determined that the liner is degrading and multiple liner penetrations were discovered. The permittee conducted pond repair work in early 2022. The permittee concluded the pond liner will continue to deteriorate and be in constant need of repair. The permittee is proposing to decommission and remove the evaporation pond and replace the treatment capability of the pond with a new WTU.

Water Treatment Unit

The treatment technology consists of a modified commercial off-the-shelf package plant contained in two 40-foot shipping containers and up to four 1-acre individual ponds. The entire facility footprint will fit on the terrace to the north of the disposal cell. The WTU consists of an Electrocoagulation (EC) system followed by a Closed-Circuit Reverse Osmosis (CCRO) System. Combining these two technologies maximizes treatment efficiency and is expected to produce effluent that will meet applicable water quality standards. The WTU is designed to treat a stream flow of 50 gpm which equals 0.072 million gallons per day (MGD).

The permittee has represented that the WTU will operate as follows: Water from the extraction wells and groundwater interceptors will be pumped to a 1,500-gallon Influent Surge Tank. Water will then be gravity-fed to an Oil Trap influent tank. The water will be pH adjusted and processed through one of two EC treatment units. Once processed, the water will be moved to a Separator Tank where the solids (sludge) will be skimmed from the top and treated will flow to three 500-gallon Reverse Osmosis (RO) Surge Tanks. The CCRO system will detect this water and begin processing under high pressure. The reject water will be pumped back to the modular evaporation tanks while the treated water will be discharged. The proposed WTU has a minimum expected treatment efficiency of 95 percent meet discharge standards.

Electrocoagulation System

The EC system is designed to remove suspended solids, metals, and oils. The EC system is comprised of two EC units designed to run in parallel, with one unit operating at a time. The system is designed to automatically switch flow from one EC unit to the other when the system software detects that the anode/cathode has reached the end of its useful life. The removed solids will be collected in filter bags and disposed at a landfill.

Closed-circuit Reverse Osmosis System

The CCRO system is designed to remove dissolved salts and other contaminants from the water including heavy metals. Because the pore size of the CCRO is so small, water molecules can pass through the CCRO membrane under certain pressures while inorganic salts and heavy metals cannot. The CCRO system can be adjusted to maximize recovery and minimize brine. Once started, the CCRO system works best with a minimum of 30 minutes of process time. Brine will be discharged to the evaporation pond at a maximum of 10 gpm.

There will be two outfalls to discharge treated water from the Shiprock WTU: 001 - San Juan River and 002 – Bob Lee Wash. The Permittee has indicated that Outfall No. 001 will be the primary outfall. See Attachment B of the permit for figures of the facility location, outfall locations, and process schematic.

IV. DESCRIPTION OF RECEIVING WATER

Discharge from Outfall No. 001 is to the San Juan River and discharge from Outfall No. 002 is to the Bob Lee Wash which is tributary to the San Juan River. There are no listed impairments or total maximum daily loads in the receiving waters.

V. DESCRIPTION OF DISCHARGE

To estimate the expected effluent quality, five active site wells were sampled. These wells will provide almost 100 percent of the water that will be treated by the Shiprock WTU. Each well was analyzed for the pollutants of interest that are typical of a uranium and vanadium ore processing facility. The permittee also performed a priority pollutant scan. To estimate the concentration and mass of each constituent, the analytical results were flow-weighted using the reported flow from each well. These results were then multiplied by the minimum expected treatment efficiency (95 percent) of the proposed WTU to calculate the expected discharge concentrations. Mass load estimates were calculated by using the flow-weighted concentrations and the average and maximum flows (Fecal coliform and all radiological constituents do not have associated mass estimates). Many of the analytical results were below the available method detection limits. Any analyte that had at least one detection was considered to be present in the wastewater stream (see Table 1).

Pollutants believed to be absent or never detected in the effluent are not included. The site is a uranium and vanadium disposal facility.

Table 1. Well Analytical Data in NPDES Application Form 2 (constituents believed to be present in the discharge)

	Units	Discharge Data		Number of Samples
		Maximum Daily Discharge	Average Daily Discharge	
Flow	MGD	0.057	0.030	24
COD	mg/L	1.21	1.21	1
BOD_5	mg/L	<0.56	<0.56	1
TSS	mg/L	<0.15	<0.15	1
Ammonia (as N)	mg/L	1.51	1.51	1
Fecal Coliform	MPN	<1.0	<1.0	1
Fluoride	mg/L	<0.000030	<0.000030	1
Nitrate-Nitrite	mg/L	3.84	3.84	1
Phosphorus, total	mg/L	<0.0013	<0.0013	1
Sulfate	mg/L	270.61	270.61	1
Surfactants	mg/L	0.0000043	0.0000043	1
Barium, total	mg/L	0.0011	0.0011	1
Boron, total	mg/L	0.017	0.017	1
Cobalt, total	mg/L	0.000061	0.000061	1
Iron, total	mg/L	0.0089	0.0089	1

Magnesium, total	mg/L	23.37	23,37	1
Molybdenum, total	mg/L	0.00038	0.00038	1
Manganese, total	mg/L	0.049	0.049	1
Tin, total	mg/L	<0.000058	<0.000058	1
Alpha radiation, total	pCi/L	5.76	5.76	1
Beta radiation, total	pCi/L	4.22	4.22	1
Radium total	pCi/L	0.049	0.049	1
Radium 226, total	pCi/L	0.020	0.020	1
Arsenic, total	mg/L	<0.00012	<0.00012	1
Copper, total	mg/L	<0.00056	<0.00056	1
Lead, total	mg/L	<0.000038	<0.000038	1
Nickel, total	mg/L	0.00039	0.00039	1
Selenium, total	mg/L	0.0030	0.0030	1
Thallium, total	mg/L	<0.000052	<0.000052	1
Zinc, total	mg/L	0.023	0.023	1
Uranium	mg/L	0.013	0.013	1
Vanadium	mg/L	<0.00033	<0.00033	1
Methyl Bromide	mg/L	<0.000017	<0.000017	1
Bis (2-ethylhexyl) phtalate	mg/L	<0.000016		

VI. DETERMINATION OF NUMERIC EFFLUENT LIMITATIONS

EPA has developed effluent limitations and monitoring requirements in the permit based on an evaluation of the technology used to treat the pollutant (i.e., "technology-based effluent limits") and the water quality requirements applicable to the receiving water. EPA has established the most stringent of applicable technology-based or water quality-based standards and water quality related standards in the draft permit, as described below.

The permit limitations in this permit are based on the following:

1. EPA's best professional judgment ("BPJ") based on effluent guidelines for Ore Mining and Dressing Point Source Category, Uranium, Radium and Vanadium Ores Subcategory (40 CFR Part 440, Subpart C).

2. EPA's evaluation of limitations needed to achieve water quality criteria pursuant to 40 CFR § 122.44(d)(1) and any more stringent limitations required by 40 CFR § 122.44(d)(5), in accordance with Section 301(b)(1)(C) of the CWA. As part of this evaluation, discharge limitations are based on applicable water quality standards. EPA approved the 1999 Navajo Nation Surface Water Quality Standards ("NNSWQS"), on March 23, 2006. The NNSWQS were revised in 2007 and 2015 and approved by EPA on October 5, 2020. The approved 2015 NNSWQS were used to develop permit limitations.

3. The Colorado River Basin Salinity Policy.

A. Applicable Technology-Based Effluent Limitations

Where Effluent Limitation Guidelines ("ELGs") or standards of performance have not been developed under Section 301(b) of the CWA, EPA relies on best professional judgment ("BPJ"), pursuant to Section 402(a)(1) of the CWA, to establish technology-based effluent limits on a case-by-case basis. 40 CFR § 125.3(c)(2). Such limits must be established based on best available technology economically achievable ("BAT") for toxics and non-conventional pollutants and best conventional pollutant control technology ("BCT") for conventional pollutants and take into consideration the factors presented in 40 CFR a 125.3(d)(2) for BCT and at 40 CFR a 125.3(d)(3) for BAT. EPA has not established technology-based ELGs or standards of performance applicable to discharges from water treatment units treating groundwater at a former uranium mill facility. Therefore, EPA used BPJ to establish technology-based effluent limits for the Shiprock WTU.

EPA considered the appropriate technology for the class of point sources for which the applicant is a member and unique factors relating to the applicant pursuant to 40 CFR § 125.3(c)(2). Based on toxics and non-conventional pollutants, EPA considered the factors listed in 125.3(d)(3) for BAT. The treatment technology is commonly used for groundwater remediation and is a cost-effective solution. The WTU has demonstrated that it can meet the pollutant reduction required in this permit. Based on the history of the site as a uranium and vanadium mining site, EPA considered New Source Performance Standards from the Uranium, Radium, and Vanadium Ores Subcategory (40 CFR § 440.34). See Table 2 for the New Source Performance Standards. The Shiprock WTU is not a mining site subject to the New Source Performance Standards at 40 CFR § 440.34, however based on its best professional judgment, EPA determined that these limits are appropriate technology-based effluent limits for the Shiprock WTU.

Table 2. New Source Performance Standards for Uranium, Radium, and Vanadium Ores

	Units	Discharge Data	
		Maximum Daily Discharge	Average Daily Discharge
COD	mg/L	200	100
Zinc	mg/L	1.0	0.5
Radium 226 (dissolved)	pCi/L	10.0	3.0
Radium 226 (total)	pCi/L	30.0	10.0
Uranium	mg/L	4.0	2.0
pH		6.0 to 9.0	6.0 to 9.0
TSS	mg/L	30.0	20.0

B. Water Quality-Based Effluent Limitations

Water quality-based effluent limitations are required in NPDES permits when the permitting authority determines that a discharge causes, has the reasonable potential to cause, or contributes to an excursion above any water quality standard (40 CFR § 122.44(d)(1)).

When determining whether an effluent discharge causes, has the reasonable potential to cause, or contributes to an excursion above narrative or numeric criteria, the permitting authority shall use procedures which account for existing controls on point and non-point sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity) and where appropriate, the dilution of the effluent in the receiving water (40 CFR § 122.44(d)(1)(ii)).

EPA evaluated the reasonable potential to discharge toxic pollutants according to guidance provided in the *Technical Support Document for Water Quality-Based Toxics Control* (TSD) (Office of Water, EPA, March 1991) and the *EPA NPDES Permit Writers' Manual* (Office of Water, EPA, September 2010). These factors include:

1. Applicable standards, designated uses and impairments of receiving water
2. Dilution in the receiving water
3. Type of industry
4. History of compliance problems and toxic impacts
5. Existing data on toxic pollutants - Reasonable Potential Analysis

1. Applicable Water Quality Standards

The NNSWQS establish water quality criteria for the following beneficial uses in the San Juan River:

- **Dom** - Domestic Water Supply
- **PrHC** - Primary Human Contact
- **ScHC** - Secondary Human Contact
- **AgWS** - Agricultural Water Supply
- **FC** - Fish Consumption
- **A&W** - Aquatic & Wildlife
- **LW** - Livestock Watering

Applicable water quality standards establish water quality criteria for the protection of aquatic wildlife from acute and chronic exposure to certain metals that are hardness dependent. EPA used a hardness value of 250 mg/L when establishing permit limits based on available hardness data.

The San Juan River in the Shiprock region is not listed as impaired according to the CWA § 303(d) List of Water Quality Limited Segments.

2. Dilution in the Receiving Water

Outfall 001 discharges directly to the San Juan River and discharges from Outfall 002 flow through the Bob Lee Wash to the San Juan River. The San Juan River is perennial. No

dilution of the effluent has been considered in the development of WQBELs applicable to the discharges.

3. Type of Industry

Typical pollutants of concern in treated wastewater from a former uranium and vanadium ore processing facility include uranium, vanadium, oil and grease, organics found in petroleum products, total dissolved solids, and total suspended solids. The SIC for the operation are 1094 Uranium- Radium-Vanadium Ores and 212290 Other Metal Ore Mining (Uranium-Radium-Vanadium).

4. History of Compliance Problems and Toxic Impacts

This is a new and initial NPDES permit for this facility.

5. Existing Data on Toxic Pollutants

For pollutants with effluent data available, EPA has conducted a reasonable potential analysis based on statistical procedures outlined in EPA's *Technical Support Document for Water Quality-based Toxics Control* herein after referred to as EPA's TSD (EPA 1991). These statistical procedures result in the calculation of the projected maximum effluent concentration based on monitoring data to account for effluent variability and a limited data set. The projected maximum effluent concentrations were estimated using a coefficient of variation and the 99 percent confidence interval of the 99th percentile based on an assumed lognormal distribution of daily effluent values (sections 3.3.2 and 5.5.2 of EPA's TSD). EPA calculated the projected maximum effluent concentration for each pollutant using the following equation:

Projected maximum concentration = C_e × *reasonable potential multiplier factor.*

Where, "C_e" is the reported maximum effluent value and the multiplier factor is obtained from Table 3-1 of the TSD.

Table 3 Summary of Reasonable Potential Statistical Analysis for Outfalls 001 and 002

Parameter[1]	Maximum Observed Concentration	*n*	RP Multiplier	Projected Maximum Effluent Concentration	Most Stringent Water Quality Criterion[2]	Statistical Reasonable Potential?
Ammonia (as N)	1.51 mg/L	1	13.2	19.9 mg/L	4.9[3]	Y
Nitrate	3.84 mg/L	1	13.2	50.7 mg/L	10 mg/L (DWS)	Y
Barium	1.1 µg/L	1	13.2	14.5 µg/L	2000 µg/L (DWS)	N
Boron	17 µg/L	1	13.2	224.4 µg/L	630 µg/L (DWS)	N
Cobalt	0.062 µg/L	1	13.2	0.8 µg/L	1000 (LW)	N
Manganese	49 µg/L	1	13.2	646.8 µg/L	980 µg/L (DWS)	N
Molybdenum	0.38 µg/L	1	13.2	5.02 µg/L	50 µg/L (AgWS)	N
Gross Alpha	5.76 pCi/L	1	13.2	67 pCi/L[4]	15 pCi/L (DWS, LW)	Y
Beta radiation	4.22 pCi/L	1	13.2	[5]	4 millirems/yr	[5]
Radium 226+228	30 pCi/L[6]	--	--	30 pCi/L	5 pCi/L (DWS, AWS, LW)	Y
Arsenic	0.12 µg/L	1	13.2	1.58 µg/L	10 µg/L (DWS)	N
Selenium	3.0 µg/L	1	13.2	39.6 µg/L	2 µg/L (A&Wc)	Y
Uranium	13 µg/L	1	13.2	171.6 µg/L	30 µg/L (DWS)	Y
Vanadium	0.33 µg/L	1	13.2	4.36 µg/L	100 µg/L (LW)	N

Parameter[1]	Maximum Observed Concentration	*n*	RP Multiplier	Projected Maximum Effluent Concentration	Most Stringent Water Quality Criterion[2]	Statistical Reasonable Potential?
Copper	0.56 µg/L	1	13.2	7.4 µg/L	19.59 µg/L[7] ($A\&W_C$)	N
Lead	0.038 µg/L	1	13.2	0.5 µg/L	6.72 µg/L[7] ($A\&W_C$)	N
Nickel	0.39 µg/L	1	13.2	5.2 µg/L	112.9 µg/L[7] ($A\&W_C$)	N
Zinc	23 µg/L	1	13.2	303 µg/L	254.7 µg/L[7] ($A\&W_A$)	Y
TSS	30 mg/L[6]	--	--	30 mg/L	25 mg/L	Y

[1] For purposes of Reasonable Potential Analysis, parameters measured as Non-Detect are considered to be zeroes. Only pollutants believed to be present in the wastewater stream are included in this analysis.
[2] Maximum effluent concentration is based on one sample and represents the influent to the treatment system with an expected treatment efficiency of 95 percent. of the proposed WTU to calculate the expected discharge concentrations.
[3] Based on pH 6.5 and Temperature 0-7 deg C. This is the highest value for ammonia and still shows reasonable potential.
[4] Subtracting out 8.71 pCi/L of activity from Uranium.
[5] Reasonable potential analysis was inconclusive. Monitoring data is provided in pCi/L and criterion is in millirems/yr. Monitoring is required in the permit.
[6] Maximum observed concentration used in the RPA is the TBEL.
[7] Based on hardness of 250 mg/L.

C. Rationale for Effluent Limitations and Monitoring

EPA evaluated the typical pollutants expected to be in ground water treatment at a uranium mill discharge effluent and selected the most stringent of applicable technology-based standards or water quality- based effluent limitations. Where effluent concentrations of toxic parameters are unknown or are not reasonably expected to be discharged in concentration that have the reasonable potential to cause or contribute to water quality standards, EPA has established- monitoring requirements in the permit. Monitoring data will be evaluated, and the permit can be re-opened to incorporate effluent limitations if necessary.

Flow

No limits have been established for flow, but flow rates must be monitored and reported. Continuous monitoring is required for flow when discharging at Outfall Nos. 001 and 002.

COD

EPA established a technology-based effluent limitation for COD based on its best professional judgment. No criteria are listed for COD in the NNSWQS.

Monitoring is required monthly to evaluate compliance with this limitation.

Ammonia and Ammonia Impact Ratio ("AIR"):

EPA determined that there is reasonable potential for ammonia to be present in the treated ground water at potentially toxic levels that could cause or contribute to exceedances above the applicable water quality criterion. EPA compared the most stringent, applicable water quality standard to the projected maximum expected value in the discharge in accordance with EPA's TSD. Ammonia criteria in NNSQWQS are pH and temperature dependent. pH and temperature data were not provided in the application, so EPA relied on conservative assumptions. The water quality standards for ammonia in freshwater for protection of **A&W** are listed in Table 207.21 (page 68) of the 2015 NNSWQS. The criterion used in the analysis was 4.9 mg-N/L based on pH 6.5 and temperature 0-7 deg C. This is the highest value for ammonia in Table 207.21. As shown in Table 3 above, even using conservative assumptions about pH and temperature, there is still reasonable potential for ammonia in the effluent to cause or contribute to exceedances above the applicable water quality criteria.

Because there is reasonable potential for ammonia in the effluent to cause or contribute to an exceedance above the applicable water quality criteria, EPA included a limit for ammonia in the permit. The limit is written in terms of AIR, which is determined by the concurrent measurement of ammonia concentration, pH and temperature. Therefore, pH, temperature, and ammonia sampling must be concurrent. AIR is calculated by dividing the ammonia concentration in the effluent by the applicable ammonia criteria. See Attachment D of the permit for a sample log to help calculate and record the AIR values. AIR provides more flexibility than a specific, fixed effluent concentration and is protective of water quality standards since the value is set relative to the ammonia criteria, which are also dependant on pH and temperature.

Ammonia monitoring is required monthly and concurrent with pH and temperature to evaluate compliance with the AIR limitation. The AIR effluent limitation value is 1.0.

Nitrate

EPA determined that there is reasonable potential for nitrate from the treated groundwater to cause or contribute to exceedances above the applicable water quality criterion. To conduct the reasonable potential analysis, EPA compared the most stringent, applicable water quality standard to the projected maximum expected value in the discharge in accordance with EPA's TSD. The water quality standards for nitrate for protection of **DWS** are listed in Table 207.1 of the 2015 NNSWQS. As shown in Table 3 above, there is reasonable potential for Nitrate in the effluent to cause or contribute to exceedances above the applicable water quality criteria and therefore a limit is included in the permit.

Monitoring is required monthly to evaluate compliance with the nitrate effluent limit.

Gross Alpha

EPA determined that there is reasonable potential for Gross Alpha from the treated groundwater to cause or contribute to exceedances above the applicable water quality criterion. To conduct the reasonable potential analysis, EPA compared the most stringent, applicable water quality standard to the projected maximum expected value in the discharge in accordance with EPA's TSD. The water quality standards for gross alpha for protection of **DWS** and LW are listed in Table 207.1 of the 2015 NNSWQS. As shown in Table 3 above, there is reasonable potential for gross alpha in the effluent to cause or contribute to exceedances above the applicable water quality criteria and therefore a limit is included in the permit.

Monitoring is required monthly to evaluate compliance with the Gross Alpha limit.

Beta radiation

The reasonable potential analysis for beta radiation was inconclusive because the data provided in the permit application does not match the units in Table 207.1 of the 2015 NNSWQS. No limits have been established for beta radiation, but monitoring is required.

Monitoring is required annually.

Radium

EPA identified technology-based effluent limitations for Radium 226 based on its best professional judgment. The effluent limitations are 10 pCi/L dissolved and 30 pCi/L total.

EPA also performed a numeric reasonable potential analysis by comparing the most stringent, applicable water quality standard to the projected maximum expected value in the discharge in accordance with EPA's TSD. The water quality standards for Radium 226+228 for protection of **DWS**, **AgWS**, and **LW** are listed in Table 207.1 of the 2015 NNSWQS.

If the permittee were to discharge at 10 pCi/L dissolved or 30 pCi/L total, then the discharge would not be protective of the Radium 226+228 criteria (5 pCi/L) for the **DWS**, **AgWS**, and **LW** designated uses of the receiving water. EPA must establish an effluent limitation that is protective of the most stringent applicable water quality criteria. EPA used the water quality criteria for Radium 226+228 (5 pCi/L) which is more stringent than both technology-based standards (10 pCi/L dissolved and 30 pCi/L total Radium 226) to establish the effluent limitation.

Monitoring is required monthly to evaluate compliance with the Radium limit.

Selenium

EPA determined that there is reasonable potential for selenium from the treated groundwater to cause or contribute to exceedances above the applicable water quality criterion. To conduct the reasonable potential analysis, EPA compared the most stringent,

applicable water quality standard to the projected maximum expected value in the discharge in accordance with EPA's TSD. The water quality standards for Selenium for protection of **A&W** are listed in Table 207.1 of the 2015 NNSWQS. As shown in Table 3 above, there is reasonable potential for Selenium in the effluent to cause or contribute to exceedances above the applicable water quality criteria and therefore a limit is included in the permit.

Monitoring is required monthly to evaluate compliance with the selenium limit.

Uranium

EPA identified a technology-based effluent limit for uranium based on its best professional judgment. The technology-based limit is 4.0 mg/L. EPA also performed a reasonable potential analysis by comparing the most stringent, applicable water quality standard to the projected maximum expected value in the discharge in accordance with EPA's TSD. The water quality standards for Uranium for protection of **DWS** are listed in Table 207.1 of the 2015 NNSWQS. As shown in Table 3 above, there is reasonable potential for uranium in the effluent to cause or contribute to exceedances above the applicable water quality criteria of 30 µg/L.

The technology-based effluent limit is insufficient to protect water quality and the effluent limit in the permit is based on the more stringent value, which is 30 µg/L.

Monitoring is required monthly to evaluate compliance with the Uranium limit.

Vanadium

No limits have been established for Vanadium, but it must be monitored and reported. The Shiprock mill was a former vanadium ore processing facility.

Monitoring is required monthly.

Zinc

EPA identified a technology-based effluent limit for Zinc based on its best professional judgment. The technology-based limit is 1.0 mg/L. EPA also performed a reasonable potential analysis by comparing the most stringent, applicable water quality standard to the projected maximum expected value in the discharge in accordance with EPA's TSD. The water quality standards for Zinc for protection of **A&W** are listed in Table 207.17 of the 2015 NNSWQS. As shown in Table 3 above, there is reasonable potential for Zinc in the effluent to cause or contribute to exceedances above the applicable water quality criteria.

The technology-based effluent limit is insufficient to protect water quality and the effluent limit in the permit is based on the more stringent standard for protection of **A&W**. The effluent limit is calculated based on a hardness of 250 mg/L and a translator of 1.000 total recoverable to 0.986 dissolved for chronic zinc aquatic criteria. See Table 1 of EPA Guidance document on metal translators (EPA 823-B-96-007).

Monitoring is required monthly to evaluate compliance with the Zinc limit.

Hardness (as $CaCO_3$)

The 2015 NNSWQS includes hardness-dependent criteria for the protection of freshwater aquatic life for metals. In order to have sufficient effluent hardness data to evaluate whether the effluent may cause or contribute to an exceedance of hardness-dependent metals criteria, this permit includes a requirement for annual monitoring for hardness.

pH

EPA identified a technology-based limit for pH based on its best professional judgment. The technology-based limit is the range 6.0 to 9.0. The water quality standard from the NNSWQS for pH is the range 6.5 to 9.0.

The water quality standards range of 6.5 to 9.0 for pH for protection of **PrHC**, **ScHC**, **A&W**, and **LW** is established in Section 206.C. of 2015 NNSWQS.

The technology-based effluent limit is insufficient to protect water quality and the effluent limit in the permit is based on the more stringent value, which is 6.5 to 9.0 Standard Units.

Monitoring is required monthly, concurrent with ammonia and temperature monitoring, to evaluate compliance with the pH limit.

Temperature

To support the Navajo Nation's established Ammonia standards and their dependence on temperature, monthly temperature monitoring of the discharge is to be performed concurrently with ammonia and pH measurements.

Total Dissolved Solids

Total dissolved solids ("TDS") is an indicator parameter for salinity. While NNSWQS do not include criteria for TDS, the regulations at 40 CFR § 122.44(i) allow requirements for monitoring as determined to be necessary. No limits are set at this time. The monitoring frequency is annually.

Total Suspended Solids

EPA identified a technology-based effluent limit for total suspended solids (TSS) based on its best professional judgment. The technology-based limit is 30.0 mg/L.

EPA also performed a reasonable potential analysis by comparing the most stringent, applicable water quality standard to the projected maximum expected value in the discharge in accordance with EPA's TSD. The water quality standards for protection of **A&W** are established in Section 206.E. of 2015 NNSWQS.

If the permittee were to discharge at 30 mg/L, then the discharge would not be protective of 25 mg/L **A&W** designated use of the receiving water. EPA must establish an effluent limitation that is protective of the most stringent applicable water quality criteria. EPA used the water quality criteria for TSS (25 mg/L) which is more stringent than the technology-based standards (30 mg/L) to establish the effluent limitation.

Monitoring is required monthly to evaluate compliance with the TSS limit.

Priority Pollutant Scan

During the first quarter of Year 1 of the permit cycle, the permittee shall monitor for the full list of priority pollutants in the Code of Federal Register (CFR) at 40 CFR Part 423, Appendix A. No effluent limits are set at this time.

D. Anti-Backsliding

Sections 402(o) and 303(d)(4) of the CWA and 40 CFR § 122.44(l) prohibit the renewal or reissuance of an NPDES permit that contains effluent limits less stringent than those established in the previous permit, except as provided in the statute and regulation.

The draft permit is a new permit so there is no backsliding.

E. Antidegradation Policy

EPA followed the antidegradation policy and implementation procedures listed in the NNSWQS (§ 201-202). The receiving water is a Tier 1 waterbody. For Tier 1 waters, the level of water quality necessary to protect existing uses shall be maintained and protected. This permit contains effluent limits imposed to prevent the discharge from causing an exceedance of an applicable water quality criterion established to protect existing uses in the receiving water. Additionally, the permit establishes monitoring requirements to evaluate whether applicable water quality standards are met.

VII. OTHER LIMITATIONS

Section 203 of the NNSWQS contains narrative water quality standards applicable to the receiving water. Therefore, the permit incorporates other limits for the discharge in Permit Part I.A.

VIII. MONITORING AND REPORTING REQUIREMENTS

The permit requires the permittee to conduct monitoring for all pollutants or parameters where effluent limits have been established, at the minimum frequency specified. Additionally, where effluent concentrations of toxic parameters are unknown or where data are

insufficient to determine reasonable potential, monitoring may be required for pollutants or parameters where effluent limits have not been established.

The permittee shall perform all monitoring, sampling and analyses in accordance with the methods described in the most recent edition of 40 CFR Part 136, unless otherwise specified in the permit. All monitoring data shall be reported on monthly DMR forms and submitted quarterly as specified in the permit.

In accordance with the NPDES Electronic Reporting Rule, these program reports must be submitted electronically by the permittee to the Director or initial recipient, as defined in 40 CFR § 127.2(b), in compliance with this section and 40 CFR § 3 (including, in all cases, subpart D to part 3), 40 CFR § 122.22, and 40 CFR § 127.

IX. SPECIAL CONDITIONS

A. Development and Implementation of Best Management Practices and Pollution Prevention

40 CFR § 122.44(k)(4) and the NNSWQS require permittees to develop (or update) and implement Best Management Practices ("BMPs") for pollution prevention. A Pollution Prevention Plan must be developed (updated) and implemented with appropriate pollution prevention measures or BMPs designed to prevent pollutants such as TSS and oil and grease from entering the San Juan River.

B. Asset Management

40 CFR § 122.41(e) requires permittees to properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. Asset management planning provides a framework for setting and operating quality assurance procedures and ensuring the permittee has sufficient financial and technical resources to continually maintain a targeted level of service. The permittee shall develop an Asset Management Program that considers short-and long-term vulnerabilities of facilities, treatment systems, and outfalls. Intent is to ensure facility operations are not disrupted and compliance with permit conditions is achieved. Asset management requirements have been established in the permit to ensure compliance with the provisions of 40 CFR § 122.41(e).

X. OTHER CONSIDERATIONS UNDER FEDERAL LAW

A. Impact to Threatened and Endangered Species

Section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1536) requires federal agencies to ensure that any action authorized, funded, or carried out by the federal agency does not jeopardize the continued existence of a listed or candidate species, or result in the destruction or adverse modification of its habitat. A federal agency must consult with the relevant Service, either U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service, if it determines that an endangered or threatened species is present in the area affected by the federal action and that the implementation of such action will likely affect the species. ESA §7(a)(3); 16 U.S.C. § 1536(a)(3). When a particular action involves more than one Federal agency, the ESA's consultation and conference responsibilities may be fulfilled through a lead agency. 50 CFR part 402.07.

1. History of Section 7 consultation

The permittee is the Department of Energy, a federal agency and the lead agency for purposes of ESA Section 7. The permittee consulted with USFWS on impacts to threatened and endangered species regarding routine Long-term Surveillance and Maintenance Activities at Legacy Management sites in the San Juan River Basin. The permittee reinitiated consultation with USFWS on August 8, 2023 with a Biological Assessment that analyzed the effects of the of the following proposed actions at the Shiprock site: 1) decommissioning of the site evaporation pond and 2) installation of a WTU. USFWS provided a concurrence letter to the permittee on September 18, 2023.

EPA generated an additional Information for Planning and Conservation (IPaC) report on May 16, 2025 to update the species lists. The IPaC report provides an up-to-date listing of all proposed (P), candidate (C), threatened (T) and endangered (E) species and their critical habitats that occur in the action area .

The action area includes the DOE Shiprock site including the evaporation pond and the construction area for the Shiprock WTU. The action area also includes the San Juan River downstream from Outfall No. 001 and the Bob Lee Wash downstream from Outfall No. 002. The treated discharge (average 0.030 MGD) from the Shiprock WTU is limited and would be diluted within the San Juan River (typical flow of 1050 MGD).

2. Species considered under Permittee consultation in 2023

Table 4 lists the ESA determination of the species and critical habitats considered in the permittee's consultation with USFWS. USFWS provided a concurrence letter to the permittee on September 18, 2023. EPA is relying on the permittee's ESA coordination and consultation with USFWS for these species and critical habitats.

Table 4. Listed species, designated under the Endangered Species Act

Type	Common Name	Scientific Name	Status(1)	Critical Habitat	Determination(1)
Fish	Colorado Pikeminnow	*Ptychocheilus lucius*	E	Yes	NLAA
	Razorback Sucker	*Xyrauchen texanus*	E	Yes	NLAA
	Zuni Bluehead Sucker	*Catostomus discobolus yarrowi*	E	No(2)	No effect
Birds	Mexican Spotted Owl	*Strix occidentalis lucida*	T	No(2)	No effect
	Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E	No(2)	No effect
	Yellow-billed Cuckoo	*Coccyzus americanus*	T	No(2)	No effect
Mammal	Canada lynx	*Lynx canadensis*	T	No(2)	No effect
	Gray Wolf (Mexican gray wolf subspecies)	*Canis lupus* (Mexican gray wolf = *Canis lupus baileyi*)	Proposed, Experimental, non-essential population	No	No effect
	New Mexico Meadow Jumping Mouse	*Zapus hudsonius luteus*	E	No(2)	No effect
Plant	Knowlton's Cactus	*Pediocactus knowltonii*	E	No	No effect
	Mancos Milk-vetch	*Astragalus humillimus*	E	No	No effect
	Mesa Verde Cactus	*Sclerocactus mesae-verdae*	T	No	NLAA
	Zuni Fleabane	*Erigeron rhizomatus*	T	No	No effect

(1) E = Endangered, T = Threatened, NLAA = Not Likely to Adversely Affect
(2) These species have designated critical habitat outside of the Action Area.

3. Additional species considered

EPA generated an IPaC report on May 16, 2025 to see if any species were added to the threatened and endangered species list since September 2023 when Section 7 consultation on the proposed Shiprock WTU project was completed. Table 5 lists new species considered for issuance of this permit.

Table 5. Listed species, designated under the U.S. Endangered Species Act

Type	Common Name	Scientific Name	Status(1)	Critical Habitat
Reptile	Northern Mexican Gartersnake	*Thamnophis eques megalops*	T	No(2)
Insects	Monarch Butterfly	*Danaus plexippus*	Proposed, T	No(2)
	Suckley's Cuckoo	*Bombus suckleyi*	Proposed, E	No

	Bumble Bee			

(1) E = Endangered, T = Threatened
(2) These species have designated or proposed critical habitat outside of the Action Area.

Reptile

Northern Mexican Gartersnake (*Thamnophis eques megalops*) is considered a riparian obligate (restricted to riparian areas when not engaged in dispersal behavior) and occurs chiefly in the following general habitat types: (1) Source-area wetlands [e.g., cienegas (mid-elevation wetlands with highly organic, reducing (basic, or alkaline) soils), stock tanks (small earthen impoundment), etc.]; (2) large river riparian woodlands and forests; and (3) streamside gallery forests (as defined by well-developed broadleaf deciduous riparian forests with limited, if any, herbaceous ground cover or dense grass). (https://ecos.fws.gov/ecp/species/7655) The Northern Mexican Gartersnake occurs only in or adjacent to the lower reaches of the Little Colorado River. The action area is not adjacent to the little Colorado River and contains no suitable wetland or riparian habitat for the Northern Mexican Gartersnake. Therefore, EPA has determined that the action will not affect the Northern Mexican Garter Snake.

Insects

Monarch Butterfly *(Danaus plexippus)* (https://ecos.fws.gov/ecp/species/9743) is a candidate species and not yet listed or proposed for listing, (Endangered and Threatened Wildlife and Plants; 12-Month Finding for the Monarch Butterfly, December 17, 2020). The monarch butterfly is a species dependent on milkweed. They also require nighttime roosting sites, generally in deciduous and evergreen trees. Small amounts of horsetail milkweed were identified on the floodplain that could contain larval butterflies. The discharger intends to site structures on the floodplain to avoid milkweed, or other avoidance or mitigation measures would be implemented to avoid adverse impacts to monarch butterflies. EPA has determined that its action will not jeopardize the continued existence of the monarch butterfly.

Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*) is a proposed endangered species (https://ecos.fws.gov/ecp/species/10885). The species has a broad distribution within western North America. Populations have been collected in various habitat types from 2 to 3200 meters elevation. They require a diversity of native floral resources like pollen and nectar. The species require thermal suitability and stability. Suckley's cuckoo bumble bee is an obligate social parasite (it depends on social hosts for survival and raising young). The species are therefore entirely dependent on host bumble bee colonies, making host colony availability a critical habitat need for the species survival and overall viability. The proposed discharge will not impact the floral resources or upland temperature. Therefore, EPA has determined that its action will not jeopardize the continued existence of the Suckley's Cuckoo Bumble Bee.

3. Summary and Conclusions

Table 6 provides a summary of the effects analysis on threatened and endangered species as well as critical habitats within the action area.

Table 6. Summary of effects analysis on T&E species and critical habitats

Threatened and Endangered Species			
Type	Common Name	Status(1)	Determination(1)
Fish	Colorado Pikeminnow	E	NLAA
	Razorback Sucker	E	NLAA
	Zuni Bluehead Sucker	E	No effect
Birds	Mexican Spotted Owl	T	No effect
	Southwestern Willow Flycatcher	E	No effect
	Yellow-billed Cuckoo	T	No effect
Mammal	Canada lynx	T	No effect
	Gray Wolf (Mexican gray wolf subspecies)	Proposed, Experimental, non-essential population	No effect
	New Mexico Meadow Jumping Mouse	E	No effect
Plant	Knowlton's Cactus	E	No effect
	Mancos Milk-vetch	E	No effect
	Mesa Verde Cactus	T	NLAA
	Zuni Fleabane	T	No effect
Reptile	Northern Mexican Gartersnake	T	No effect
Insects	Monarch Butterfly	Proposed, T	No effect
	Suckley's Cuckoo Bumble Bee	Proposed, E	No effect
Critical Habitats			
Type	Common Name	Status	Effects
Fish	Colorado Pikeminnow	E	NLAA
	Razorback Sucker	E	NLAA
Birds	Yellow-billed Cuckoo	T	No effect

(1) E = Endangered, T = Threatened, NLAA = Not Likely to Adversely Affect

If, in the future, EPA obtains information or is provided information that indicates that there could be adverse impacts to federally listed species, EPA will contact the appropriate agency or agencies and initiate consultation, to ensure that such impacts are minimized or mitigated. In addition, a re-opener clause is included in this permit should new information become available to indicate that the requirements of the permit need to be changed.

B. National Environmental Policy Act Compliance

The facility is not a "new source" as defined at 40 C.F.R. § 122.2. A "new source" is a facility from which there is or may be a discharge of pollutants and where construction commenced after promulgation (or in some instances proposal) of applicable standards of

performance under CWA Section 306. EPA has not proposed or promulgated standards of performance for package plant water treatment units for groundwater remediation. Therefore, the facility is not a new source.

New sources are subject to the environmental review provisions of the National Environmental Policy Act pursuant to 40 C.F.R. § 122.29(c)(i). Because the facility is not a new source it is not subject to the requirements of 40 C.F.R. § 122.29(c)(i).

C. Impact to Coastal Zones

The Coastal Zone Management Act ("CZMA") requires that federal activities and licenses, including federally permitted activities, must be consistent with an approved state Coastal Management Plan (CZMA Sections 307(c)(1) through (3)). Section 307(c) of the CZMA and implementing regulations at 40 CFR Part 930 prohibit EPA from issuing a permit for an activity affecting land or water use in the coastal zone until the applicant certifies that the proposed activity complies with the State (Tribe or Territory) Coastal Zone Management program, and the State (Tribe or Territory) or its designated agency concurs with the certification.

The permit does not affect land or water use in the coastal zone; therefore, CZMA does not apply to this permit.

D. Impact to Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act ("MSA") set forth new mandates for the National Marine Fisheries Service, regional fishery management councils and other federal agencies to identify and protect important marine and anadromous fish species and habitat. The MSA requires federal agencies to make a determination on Federal actions that may adversely impact Essential Fish Habitat ("EFH").

The permit does not directly discharge to areas of essential fish habitat (i.e., not in marine waters). Therefore, EPA has determined that essential fish habit does not apply to this permit.

E. Impact to National Historic Properties

Section 106 of the National Historic Preservation Act ("NHPA") requires federal agencies to consider the effect of their undertakings on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. The permittee consulted with the Tribal Historic Preservation Officer at the Navajo Nation Heritage & Historic Preservation Department. The permittee determined that in accordance with 36 CFR 800.4(d)(1), no historic properties would be affected by the proposed construction and operation of the WTU at the Shiprock project site.

The permit does not allow the disturbance of any historic properties.

F. Water Quality Certification Requirements (40 CFR § 124.53 and § 124.54)

For this permit, the Permittee is required to seek water quality certification that this Permit will meet applicable water quality standards (including paying applicable fees) from the Navajo Nation EPA. Certification under section 401 of the CWA must be in writing and include the conditions necessary to assure compliance with referenced applicable provisions of sections 208(e), 301, 302, 303, 306, and 307 of the CWA and appropriate requirements of Tribal law. EPA cannot issue the Permit until the certifying Tribes have granted certification under 40 CFR § 124.55 or waived its right to certify.

The Navajo Nation EPA publicly posted their 401 certification for 30 days from October 30, 2024 to November 28, 2024 and received no comments. The Navajo Nation EPA issued a certification under CWA section 401 on December 5, 2024.

XI. STANDARD CONDITIONS

A. Reopener Provisions

In accordance with 40 CFR Parts 122 and 124, the draft permit may be modified by EPA to include effluent limits, monitoring, or other conditions to implement new regulations, including EPA-approved Tribal water quality standards; to address new information indicating the presence of effluent toxicity or the reasonable potential for the discharge to cause or contribute to exceedances of water quality standards; or new permit conditions for species pursuant to ESA requirements.

B. Standard Provisions

The permit requires the permittee to comply with EPA Region 9's *Standard Federal NPDES Permit Conditions* found at Part III of the permit.

XII. ADMINISTRATIVE INFORMATION

A. Public Notice (40 CFR § 124.10)

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a NPDES permit or other significant action with respect to an NPDES permit or application.

B. Public Comment Period (40 CFR § 124.10)

Notice of the draft permit will be on EPA Region 9's website for a 30-day comment period for interested parties to respond in writing to EPA. Comments may be submitted until the close of the public comment period to Gullapalli.Prasad@epa.gov.

C. Public Hearing (40 CFR § 124.12(c))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if EPA determines there is a significant amount of interest expressed during the 30-day public comment period or when it is necessary to clarify the issues involved in the permit decision.

XIII. CONTACT INFORMATION

Comments, submittals, and additional information relating to this proposal may be directed to:

Prasad Gullapalli, NPDES Permits Office, EPA Region 9
Gullapalli.Prasad@epa.gov
(415) 972-3406

XIV. REFERENCES

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