ADDENDUM
Modified Statement of Basis

PERMITTEE:	Oldcastle SW Group, Inc. d/b/a Four Corners Materials
FACILITY NAME AND ADDRESS:	Four Corners Materials Bayfield Pit and Plant P.O. Box 1969 6699 CR 521 Bayfield, Colorado 81122
PERMIT NUMBER:	CO-0034665
RESPONSIBLE OFFICIAL:	Kyle M. High, General Manager
FACILITY CONTACT:	Matt R. Carnahan, Resource and Environmental Manager
PERMIT TYPE:	Indian Country, Individual, Renewal
TYPE OF TREATMENT:	Settling Ponds
FACILITY LOCATION:	T 34 N, R 7 W, S 14U, NW ¼, La Plata County, Colorado
DISCHARGE LOCATION:	37.191371° north latitude 107.586513° west longitude.

Permit Modification Background:

On June 24, 2019, the U.S. Environmental Protection Agency (EPA) issued a National Pollutant Discharge Elimination System (NPDES) permit to Four Corners Materials Bayfield Pit and Plant (Permit), a gravel mining operation located on the Southern Ute Reservation in Colorado, which is home to the Southern Ute Indian Tribe. The Permit effective date was July 1, 2019, and the expiration date is June 30, 2024.

In July of 2019, the permittee contacted the EPA to voice several concerns with the final Permit, which they followed up with a letter in October 2019. The permittee's major concerns were based on not being notified during the public notice period and thus not being able to make comments, and also that EPA's aquatic life criteria for aluminum changed in December 2018, and these changes were not incorporated into the final Permit.

The EPA determined that both of these concerns were valid and agreed to propose modifications to certain provisions in the Permit. The draft permit modification makes the following changes to the Permit:

- Section 1.3.1 – modified effluent limitations for aluminum to comply with new aluminum aquatic life criteria.
- Section 1.3.2 – modified monitoring sample type for total dissolved solids (TDS), total suspended solids (TSS), and aluminum.
- Section 1.3.3 (new section) – added monitoring requirements to the receiving water to comply with new aluminum aquatic life criteria.

The reasoning and basis for each of these changes is described in greater detail below.

Effect of Statement of Basis Addendum

This addendum is intended to provide the reasoning and basis for the draft modified permit. It serves as a supplement to the statement of basis originally issued with this permit on June 24, 2019 (effective date of July 1, 2019).

Draft Modifications to Permit Requirements

On Page 7 of 26 of the Permit, Section 1.3.1, *Table 2 – Effluent Limitations* will be **replaced** with the following:

Table 2 – Effluent Limitations

Effluent Characteristic	Effluent Limitation		
	30-Day Average a/	7-Day Average a/	Daily Maximum a/
Total Suspended Solids (TSS), mg/L	30	45	N/A
Escherichia coli, no./100 mL	N/A	N/A	200
Oil and Grease (O&G), mg/L	N/A	N/A	10
Aluminum, Total Recoverable, mg/L b/	0.74	N/A	1.4
The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.			
There shall be no discharge of water which contacts solid or liquid wastes which are not required for the mining and processing of sand and gravel.			
There shall be no discharge of sanitary wastewaters from toilets or related facilities.			
No chemicals shall be added to the discharge unless prior written permission for the use of a specific chemical is granted by the permit issuing authority. In granting such use, additional limitations and/or monitoring requirements may be imposed.			
There shall be no discharge of floating debris, scum, foam, oil and grease, or other surface materials in quantities sufficient to harm existing beneficial uses of the receiving water.			
Bulk storage structures for petroleum products and other chemicals shall have adequate protection so as to prevent any reasonable loss of the material from entering discharged waters or waters of the United States. Dependent on the amount of products stored, the permittee may need to prepare a Spill Prevention Control and Countermeasures Plan as required by 40 C.F.R. Part 112.			

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

b/ The total recoverable aluminum effluent limit is partially based on estimation of parameters required to determine an aluminum standard. This 'best estimate limit' will last for the life of this permit. Data collected by the permittee in the Los Pinos River will be used to determine the appropriate effluent limits for the next permit.

Summary of changes:

- The original 30-Day Average for "Aluminum, Total Recoverable" was changed from 0.087 mg/L to 0.74 mg/L. The original Daily Maximum for "Aluminum, Total Recoverable" was changed from 0.75 mg/L to 1.4 mg/L.

Basis for change:

In December of 2018, the EPA issued its final aquatic life criteria (ALC) for aluminum[1]. These criteria replaced older criteria developed in 1988. The updated aluminum criteria better reflect the latest science regarding co-effects of other pollutants. Studies have shown that three water chemistry parameters – pH, total hardness, and dissolved organic carbon (DOC) – can affect the toxicity of aluminum by affecting the bioavailability of aluminum in the water to aquatic species. Unlike the fixed acute and chronic values found in the 1988 criteria recommendation (0.750 mg/L and 0.087 mg/L, respectively), these final 2018 recommended criteria provide the flexibility to develop site-specific criteria based on local water chemistry.

Aluminum is found in most soils and rocks. It is the third most abundant element and the most common metal in the earth's crust. Aluminum can enter the water via natural processes, like weathering of rocks. Aluminum is also released to water by mining, industrial processes using aluminum, and in wastewater and drinking water treated with alum, an aluminum compound. Aluminum is considered a non-essential metal because fish and other aquatic life do not need it to function. Elevated levels of aluminum can affect some species' ability to regulate ions, like salts, and inhibit respiratory functions, like breathing. Aluminum can accumulate on the surface of fish gills, leading to respiratory dysfunction, and possibly death. Aquatic plants are generally less sensitive to aluminum than fish and other aquatic life.

The bioavailability of aluminum is dependent on the chemistry of the water. The more bioavailable the aluminum is, the more likely it is to cause a toxic effect. The water chemistry parameters that have the greatest impact on aluminum's bioavailability are pH, total hardness, and DOC.

- pH: a low pH generally makes it easier for aluminum to be dissolved, and therefore more bioavailable. At higher pH, aluminum speciation changes make it more bioavailable.
- Hardness: generally, higher hardness values mean there are more ions present. These ions compete with aluminum and make aluminum less bioavailable.
- DOC: higher dissolved organic carbon reduces bioavailability. Aluminum binds to DOC, making the aluminum less bioavailable to aquatic organisms.

To determine the values of pH, total hardness, and DOC to use in the *initial* calculation of the aquatic life criteria, two approaches were taken. Data from USGS 09354500 Los Pinos River at La Boca, CO (approximately 20 miles downstream of the permitted outfalls) was used for pH and total hardness data. A dataset with 37 paired values of pH and total hardness was available at this gage (Table A-1). There were only two measurements of DOC taken at this location (in July and August of 2002). Since two measurements is not a large enough dataset,

[1] EPA, 2018. Final Aquatic Life Ambient Water Quality Criteria for Aluminum – 2018, EPA-822-R-18-001, December 2018, retrieved from https://www.epa.gov/wqc/2018-final-aquatic-life-criteria-aluminum-freshwater

data from several national organic carbon databases were compiled, and the 10th percentile of the Ecoregion 20 (Colorado Plateau) data was used (1.2 mg/L). A low value (10th percentile) of DOC was used to be conservative since higher DOC values make aluminum less toxic. This value was plugged in with each of the 37 pH/hardness pairs and run through the online aluminum criteria calculator to determine acute and chronic criteria (https://www.epa.gov/wqc/aquatic-life-criteria-aluminum) (Table A-1).

Table A-1. Calculated Acute and Chronic ALC for Aluminum

Date	DOC (mg/L)	Hardness (mg/L)	pH	Acute Criteria (µg/L)	Chronic Criteria (µg/L)
7/8/1969	1.2	91	7.6	1,700	740
8/4/1969	1.2	66	7.9	1,900	1,000
9/11/1969	1.2	78	7.6	1,600	740
10/15/1969	1.2	58	7.8	1,800	920
11/18/1969	1.2	71	7.7	1,700	830
12/9/1969	1.2	73	7.8	1,800	930
1/13/1970	1.2	89	8.1	2,100	1,200
2/9/1970	1.2	97	8.2	2,100	1,300
3/9/1970	1.2	110	7.8	2,000	930
4/14/1970	1.2	100	7.8	1,900	930
5/11/1970	1.2	92	7.6	1,700	740
6/8/1970	1.2	85	7.7	1,800	830
7/13/1970	1.2	94	7.7	1,800	830
10/12/1970	1.2	61	7.8	1,800	930
1/20/1971	1.2	86	7.8	1,900	930
4/19/1971	1.2	110	8.1	2,200	1,200
7/21/1971	1.2	100	7.9	2,000	1,000
10/19/1971	1.2	110	7.9	2,100	1,000
2/15/1972	1.2	88	7.6	1,700	740
5/23/1972	1.2	110	8.6	1,800	1,100
8/29/1972	1.2	110	8.1	2,200	1,200
11/28/1972	1.2	130	7.9	2,100	1,000
5/2/1973	1.2	83	8	2,000	1,100
8/28/1973	1.2	90	8.9	1,400	870
5/3/1974	1.2	110	8.3	2,100	1,400
1/12/1988	1.2	91.8	8.6	1,800	1,100
7/11/1988	1.2	93.4	8.6	1,800	1,100
11/3/1988	1.2	102	8.2	2,100	1,300
12/6/1988	1.2	76	8.7	1,600	1,000
3/29/1989	1.2	70.6	8.1	2,000	1,200
6/20/1989	1.2	103	8.6	1,800	1,100

Date	DOC (mg/L)	Hardness (mg/L)	pH	Acute Criteria (µg/L)	Chronic Criteria (µg/L)
7/11/1989	1.2	102	8.8	1,500	960
4/9/1990	1.2	120	8.3	2,200	1,400
7/20/1990	1.2	82.2	8.6	1,800	1,100
8/13/1991	1.2	92.2	8.6	1,800	1,100
8/2/2002	1.2	137	8.4	2,100	1,400
9/19/2002	1.2	131	8.7	1,700	1,100
Minimum Values:				**1,400**	**740**

Factors suggesting that these estimates are likely to have some error associated with them include:

- The pH and hardness data were not collected near the discharge location,
- Most of the pH and hardness data are almost 50 years old, and
- The DOC was estimated at an eco-regional level.

Thus, a conservative approach was taken in the selection of a criteria. In addition to the 10^{th} percentile of DOC estimates being used in the calculation, the *minimum* calculated value from Table A-1 was used for the acute and chronic criteria in the permit modification. This is likely an overly conservative approach, but the national guidance for determining aluminum criteria has not been finalized and this is the first permit in Region 8 that addresses the new aluminum ALC, so a conservative approach at this point is appropriate. The permittee will be responsible for collecting pH, hardness, and DOC data in the receiving water to better characterize the aluminum ALC in future permits (see "Self-Monitoring Requirements" below).

On Page 8 of 26 of the Permit, Section 1.3.2, *Table 3 – Monitoring Requirements* will be **replaced** with the following:

Table 3 – Monitoring Requirements

Effluent Characteristic	Frequency	Sample Type a/
Flow, mgd b/	Weekly	Instantaneous
TSS, mg/L	Monthly	Grab
Total Dissolved Solids (TDS), mg/L	Monthly	Grab
E. coli, no./100 mL	Monthly	Grab
pH, units	Weekly	Grab
Aluminum, Total Recoverable, mg/L	Monthly	Grab
O&G, mg/L	Monthly	Grab

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

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

Summary of changes:

- The "Sample Type" for TSS, TDS, and Aluminum has been changed from Composite to Grab.

Basis for changes:

The sample type has been changed to reflect a concern that the permittee had with the permit but was unable to comment on because they were not informed of the public notice period. The permittee reached out to EPA with this concern soon after they received the final permit.

Composite samples are typically required of mining discharges for most parameters (including metals, TSS, and TDS). The one exception is discharges from large retention ponds. This large retention pond clause is discussed in 40 C.F.R. 122.21(g)(7) – instead of composite sampling, *"A minimum of one grab sample [per monitoring period] may be taken for effluents from holding ponds or other impoundments with a retention period greater than 24 hours."*

The permittee discharges from a 20-acre impoundment that has a residence time of anywhere from one week to several months (depending on the inflows and discharges). Since the holding pond that discharges to Outfalls 001 and 002 has a retention period greater than 24 hours, it is reasonable to modify the sampling requirements from composite to grab samples in the permit modification.

After Section 1.3.2, *Self-Monitoring Requirements- Outfall 001 and Outfall 002* on Page 8 of 26 of the Permit, the following section and table will be **added** regarding monitoring requirements in the Los Pinos River:

1.3.3. Self-Monitoring Requirements - Outfall 001R- Upstream receiving water

Effective immediately and lasting through the effective term of this Permit. Sampling and test procedures for pollutants listed in this part shall be in accordance with guidelines promulgated by the Administrator in 40 C.F.R. Part 136, as required in 40 C.F.R. § 122.41(j). At a minimum, the following constituents shall be monitored at the frequency and with the type of measurement indicated; samples or measurements shall be representative of the volume and nature of the monitored discharge.

Samples for receiving water parameters shall be collected from the Los Pinos River ***just upstream*** of the discharge of Outfall 001. The approximate coordinates of the sampling location are 37.1912° N, 107.5878° W. This location will be referred to as Outfall 001R. Note that this sampling is a requirement regardless of whether or not the facility is discharging at that time.

Table 4 – Monitoring Requirements for Outfall 001R (Los Pinos River)

Receiving Water Characteristic	Frequency	Sample Type a/
Sampling Date (mm/dd/yyyy)	Quarterly	Report
Sampling Time (military time – hh:mm)	Quarterly	Report
Aluminum, Total Recoverable (mg/L)	Quarterly	Grab
Dissolved Organic Carbon (field filtered), mg/L	Quarterly	Grab
Total Hardness, mg/L	Quarterly	Grab
pH, units	Quarterly	Grab

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

Summary of changes:

- A required sampling location has been added in the receiving water (Los Pinos River) and sampling will be required quarterly for aluminum, DOC, hardness, and pH.

Basis for change:

The new ALC for aluminum requires knowledge of the receiving water characteristics to properly determine an appropriate standard. The calculation that the aluminum ALC uses includes DOC, hardness, and pH. Currently, there is almost no DOC data for the Los Pinos River, and limited hardness and pH data. This required data collection will result in a set of approximately 20 data points with paired DOC, hardness, and pH, which will result in a much more robust calculation of the aluminum ALC for the next permitting cycle. Aluminum

sampling in the receiving stream will allow for a better analysis of the facility's impacts to the receiving water and provide more information on those impacts for the next permitting cycle.

MISCELLANEOUS

Permit modification and addendum to statement of basis drafted by Erik Makus, U.S. EPA, December 2019.

PUBLIC NOTICE AND RESPONSE TO COMMENTS

The Permit modification and addendum to the statement of basis were public noticed in the Durango Herald on January 17, 2020. The EPA received no comments during the public notice period.