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October 26, 2017

Mr. Mike Cirian, P.E.
United States Environmental Protection Agency
108 East 9th Street
Libby, Montana 59923

Re: Crushed Concrete Sampling Results
Stockpiles 01A and 01B

Dear Mr. Cirian:

Roux Associates, Inc. (Roux Associates) has prepared this letter for the United States Environmental Protection Agency (USEPA) to summarize concrete sampling results from crushed concrete stockpiles designated as Stockpile 01A and 01B at the CFAC Site.

Sampling Scope of Work

Roux Associates' subcontractor Hydrometrics collected a concrete sample from stockpiles 01A and 01B in accordance with the Concrete Sampling and Analysis Plan (dated August 31, 2016) and in accordance with the email memorandum provided to the United States Environmental Protection Agency (USEPA) dated June 19, 2017. As requested by the USEPA, one, 30-point composite sample was collected from the stockpiles. The stockpiles were estimated to be less than 5,000 cubic yards in total volume.

The concrete sample was sent to TestAmerica laboratories (Edison, NJ), which is the laboratory being utilized for the Remedial Investigation/Feasibility Study (RI/FS) at the CFAC Site. The sample was analyzed for the analytes outlined in the Concrete Sampling and Analysis Plan, including:

- RCRA 8 metals;
- Total Fluoride;
- Total Cyanide;
- Polychlorinated biphenyls (PCBs);
- TCL Semi Volatile Organic Compounds (SVOCs);
- Synthetic Precipitation Leaching Procedure (SPLP) TCL Volatile Organic Compounds (VOCs);
- SPLP TCL SVOCs;
- SPLP Target Analyte List (TAL) Metals;
- SPLP PCBs;

- SPLP Free Cyanide; and
- SPLP Fluoride.

Based on the sampling results, CFAC and Roux Associates requested that TestAmerica re-analyze the sample for selected analyses to confirm the laboratory results. CFAC also requested that Roux Associates/Hydrometrics collect an additional 30-point composite sample from the stockpiles. The additional sample was analyzed for the same analytes as the original sample.

Sampling Results

Tables 1 through 9 attached to this letter summarize the sample results from stockpiles 01A/01B. As noted in the Concrete Sampling and Analysis Plan, concrete total analyses results were compared to USEPA Residential and Industrial Risk Screening Levels (RSLs) to evaluate potential exposure risk. The SPLP leachate analysis results from the concrete samples were compared to USEPA Maximum Contaminant Levels (MCLs) where available, and in the absence of MCLs, USEPA Tapwater RSLs.

The concrete sampling results indicate the following:

- Concentrations of total SVOCs exceed USEPA Industrial RSLs in both the original analysis and the reanalysis of the initial sample, and total SVOCs exceed USEPA Residential RSLs in the analysis of the additional sample.
- Concentrations of leachable fluoride via the SPLP exceed the USEPA MCL in both the original analysis and the reanalysis of the initial sample. Leachable fluoride did not exceed the MCL in the additional sample.

Should there be any questions or comments on this submission, please do not hesitate to contact Roux Associates at (631) 232-2600.

Sincerely,

ROUX ASSOCIATES, INC.

Michael Ritorto
Principal Hydrogeologist

Andrew Baris
Principal Hydrogeologist/
Vice President

Enclosures:

Tables 1-9 – Crushed Concrete Sample Results from Stockpiles 01A and 01B
Figure 1 – Crushed Concrete Sample Locations

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Notes Utilized Throughout Tables	
EPA	United States Environmental Protection Agency
Industrial RSL	United States Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL	United States Environmental Protection Agency Residential Soil Regional Screening Level
EPA Drinking MCL	United States Environmental Protection Agency Risk Based Screening Level Drinking Water MCL
EPA Tapwater RSL	United States Environmental Protection Agency Risk Based Screening Level Tapwater RSL
µg/L	Micrograms per Liter
mg/kg	Milligrams per kilogram
B	The analyte was found in an associated method blank as well as in the sample
J-	Estimated Low Bias
J	Estimated value
J+	Estimated High Bias
T	LCS or LCSD is outside acceptance limits
D	A secondary analysis after dilution due to exceedance
U	Indicates that analyte was not detected at the limit reported

Table 1. Semivolatile Organic Compounds in Concrete
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01	CFSP-01A
			Sample Date	08/10/2017	08/10/2017	09/01/2017
			Sample Type	N	N	N
			Sample Type	Stockpile1 Validated	Stockpile 1 Reanalysis	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601390132	4601402781
Analyte	EPA Residential Soil RSL	EPA Industrial Soil RSL	Unit			
1,1'-Biphenyl	4.7	20	mg/kg	0.14 U	0.058 U	0.029 U
1,2,4,5-Tetrachlorobenzene	2.3	35	mg/kg	0.13 U	0.051 U	0.025 U
1,4-Dioxane	5.3	24	mg/kg	0.45 U	0.18 U	0.09 U
2,2'-oxybis[1-chloropropane]	310	4700	mg/kg	0.07 U	0.028 U	0.014 U
2,3,4,6-Tetrachlorophenol	190	2500	mg/kg	0.16 U	0.064 U	0.032 R
2,4,5-Trichlorophenol	630	8200	mg/kg	0.17 U	0.068 U	0.034 R
2,4,6-Trichlorophenol	6.3	82	mg/kg	0.048 U	0.019 U	0.0096 R
2,4-Dichlorophenol	19	250	mg/kg	0.04 U	0.016 U	0.008 R
2,4-Dimethylphenol	130	1600	mg/kg	0.37 U	0.15 U	0.074 R
2,4-Dinitrophenol	13	160	mg/kg	1.3 U	0.51 U	0.25 R
2,4-Dinitrotoluene	1.7	7.4	mg/kg	0.067 U	0.027 U	0.013 UJ
2,6-Dinitrotoluene	0.36	1.5	mg/kg	0.09 U	0.036 U	0.018 UJ
2-Chloronaphthalene	480	6000	mg/kg	0.039 U	0.015 U	0.0076 U
2-Chlorophenol	39	580	mg/kg	0.043 U	0.017 U	0.0086 R
2-Methylnaphthalene	24	300	mg/kg	0.064 J	0.031 J	0.0074 UJ
2-Methylphenol	320	4100	mg/kg	0.074 U	0.03 U	0.015 R
2-Nitroaniline	63	800	mg/kg	0.056 U	0.022 U	0.011 U
2-Nitrophenol	--	--	mg/kg	0.057 U	0.023 U	0.011 R
3 & 4 Methylphenol	--	--	mg/kg	0.045 U	0.018 U	0.009 R
3,3'-Dichlorobenzidine	1.2	5.1	mg/kg	0.19 U	0.076 U	0.038 U
3-Nitroaniline	--	--	mg/kg	0.05 U	0.02 U	0.01 U
4,6-Dinitro-2-methylphenol	0.51	6.6	mg/kg	0.45 U	0.18 U	0.09 R
4-Bromophenyl phenyl ether	--	--	mg/kg	0.053 U	0.021 U	0.011 U
4-Chloro-3-methylphenol	630	8200	mg/kg	0.073 U	0.029 U	0.014 R
4-Chloroaniline	2.7	11	mg/kg	0.044 U	0.017 U	0.0087 U
4-Chlorophenyl phenyl ether	--	--	mg/kg	0.051 U	0.02 U	0.01 UJ
4-Nitroaniline	25	110	mg/kg	0.064 U	0.026 U	0.013 UJ
4-Nitrophenol	--	--	mg/kg	0.82 U	0.33 U	0.16 R
Acenaphthene	360	4500	mg/kg	0.32 J	0.24 J	0.0082 UJ
Acenaphthylene	--	--	mg/kg	0.044 U	0.017 U	0.0087 UJ
Acetophenone	780	12000	mg/kg	0.037 U	0.015 U	0.0073 UJ
Anthracene	1800	23000	mg/kg	1.5 J	1.7	0.032 UJ
Atrazine	2.4	10	mg/kg	0.076 U	0.03 U	0.015 U
Benzaldehyde	170	820	mg/kg	0.13 U	0.052 U	0.026 UJ
Benzo[a]anthracene	**0.16**	**2.9**	mg/kg	**4.8**	**4.8**	0.048 J-
Benzo[a]pyrene	**0.016**	**0.29**	mg/kg	**4.3**	**4.4**	**0.035 J-**
Benzo[b]fluoranthene	**0.16**	**2.9**	mg/kg	**8.1**	**7.4**	0.07 J-
Benzo[g,h,i]perylene	--	--	mg/kg	1.7	3.6	0.035 J
Benzo[k]fluoranthene	**1.6**	29	mg/kg	**3.1**	**2.8**	0.022 J-
Bis(2-chloroethoxy)methane	19	250	mg/kg	0.053 U	0.021 U	0.011 UJ

Table 1. Semivolatile Organic Compounds in Concrete
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01	CFSP-01A
			Sample Date	08/10/2017	08/10/2017	09/01/2017
			Sample Type	N	N	N
			Sample Type	Stockpile1 Validated	Stockpile 1 Reanalysis	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601390132	4601402781
Analyte	EPA Residential Soil RSL	EPA Industrial Soil RSL	Unit			
1,1'-Biphenyl	4.7	20	mg/kg	0.14 U	0.058 U	0.029 U
Bis(2-chloroethyl)ether	0.23	1	mg/kg	0.04 U	0.016 U	0.008 UJ
Bis(2-ethylhexyl) phthalate	39	160	mg/kg	0.066 U	0.077 J	0.013 UJ
Butyl benzyl phthalate	290	1200	mg/kg	0.052 U	0.021 U	0.01 UJ
Caprolactam	3100	40000	mg/kg	0.12 U	0.049 U	0.024 U
Carbazole	--	--	mg/kg	1.4 J	1.5	0.023 J-
Chrysene	16	290	mg/kg	9.8	8.1	0.098 J-
Dibenz(a,h)anthracene	**0.016**	**0.29**	mg/kg	**0.59**	**0.78**	0.018 U
Dibenzofuran	7.3	100	mg/kg	0.14 J	0.097 J	0.01 UJ
Diethyl phthalate	5100	66000	mg/kg	0.048 U	0.019 U	0.0096 UJ
Dimethyl phthalate	--	--	mg/kg	0.049 U	0.02 U	0.0098 UJ
Di-n-butyl phthalate	630	8200	mg/kg	0.24 J	0.02 U	0.01 UJ
Di-n-octyl phthalate	63	820	mg/kg	0.086 U	0.035 U	0.017 UJ
Fluoranthene	240	3000	mg/kg	13	13	0.2 J-
Fluorene	240	3000	mg/kg	0.32 J	0.2 J	0.0073 UJ
Hexachlorobenzene	0.21	0.96	mg/kg	0.069 U	0.028 U	0.014 U
Hexachlorobutadiene	1.2	5.3	mg/kg	0.048 U	0.019 U	0.0095 U
Hexachlorocyclopentadiene	0.18	0.75	mg/kg	0.11 UJ	0.042 U	0.021 U
Hexachloroethane	1.8	8	mg/kg	0.062 U	0.025 U	0.012 UJ
Indeno[1,2,3-cd]pyrene	**0.16**	**2.9**	mg/kg	**2.9**	**3.9**	0.037
Isophorone	570	2400	mg/kg	0.037 U	1.9	5.6 J-
Naphthalene	3.8	17	mg/kg	0.081 J	0.055 J	0.0086 UJ
Nitrobenzene	5.1	22	mg/kg	0.053 U	0.021 U	0.011 U
N-Nitrosodi-n-propylamine	0.078	0.33	mg/kg	0.057 U	0.023 U	0.011 UJ
N-Nitrosodiphenylamine	110	470	mg/kg	0.15 U	0.062 U	0.031 U
Pentachlorophenol	1	4	mg/kg	0.21 U	0.082 U	0.041 R
Phenanthrene	--	--	mg/kg	6.1	4.5	0.11 J-
Phenol	1900	25000	mg/kg	0.056 U	0.022 U	0.011 R
Pyrene	180	2300	mg/kg	12	11	0.19 J-

Table 2. Metals in Concrete
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01	CFSP-01A
			Sample Date	08/10/2017	08/10/2017	09/01/2017
			Sample Type	N	N	N
			Sample Type	Stockpile1 Validated	Stockpile 1 Reanalysis	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601390132	4601402781
Analyte	EPA Residential Soil RSL	EPA Industrial Soil RSL	Unit			
Arsenic	**0.68**	**3**	mg/kg	**6.2**	**1.9**	**3.7**
Barium	1500	22000	mg/kg	99.9	29.3	130
Cadmium	7.1	98	mg/kg	0.37 J	0.35 U	0.35 U
Chromium	12000	180000	mg/kg	23.6	15.2	46.5
Cyanide, Total	2.3	15	mg/kg	1.2	1.6 B	1.8
Lead	400	800	mg/kg	83.3	13.4	6.3
Mercury	1.1	4.6	mg/kg	0.011 U	0.01 U	0.011 U
Selenium	39	580	mg/kg	0.3 U	0.31 U	0.31 U
Silver	39	580	mg/kg	0.62 U	0.65 U	0.65 U

Total chromium results are compared to Chromium (III) EPA RSLs.

The EPA residential and industrial RSLs for arsenic are lower than naturally occurring concentrations of arsenic typically found Montana soil, as presented in Montana Department of Environmental Quality (MDEQ) document titled "Background Concentrations of Inorganic Constituents in Montana Surface Soils" (Hydrometrics, 2013).

Table 3. Polychlorinated Biphenyl in Concrete
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01A
			Sample Date	08/10/2017	09/01/2017
			Sample Type	N	N
			Sample Type	Stockpile 1 Validated	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601402781
Analyte	EPA Residential Soil RSL	EPA Industrial Soil RSL	Unit		
Aroclor 1016	0.41	5.1	mg/kg	0.0091 U	0.0091 U
Aroclor 1221	0.2	0.83	mg/kg	0.0091 U	0.0091 U
Aroclor 1232	0.17	0.72	mg/kg	0.0091 U	0.0091 U
Aroclor 1242	0.23	0.95	mg/kg	0.0091 U	0.0091 U
Aroclor 1248	0.23	0.95	mg/kg	0.0091 U	0.0091 U
Aroclor 1254	**0.12**	0.97	mg/kg	**0.23**	0.0094 U
Aroclor 1260	0.24	0.99	mg/kg	0.0095 U	0.0094 U
Aroclor 1268	--	--	mg/kg	0.0095 U	0.0094 U
Aroclor-1262	--	--	mg/kg	0.0095 U	0.0094 U
Polychlorinated biphenyls, Total	0.23	0.94	mg/kg	0.23	0.0094 U

Table 4. General Chemistry in Concrete
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01	CFSP-01A
			Sample Date	08/10/2017	08/10/2017	09/01/2017
			Sample Type	N	N	N
			Sample Type	Stockpile1 Validated	Stockpile 1 Reanalysis	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601390132	4601402781
Analyte	EPA Residential Soil RSL	EPA Industrial Soil RSL	Unit			
Fluoride	310	4700	mg/kg	20.1 J-	90.7 D	10.1

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Table 5. Volatile Organic Compounds in Concrete Leachate
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01A
			Sample Date	8/10/2017	9/1/2017
			Sample Type	N	N
			Sample Type	Stockpile 1 Validated	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601402781
Analyte	EPA Risk Based Screening Level Drinking water MCL	EPA Risk Based Screening Level Tapwater RSL	Unit		
1,1,1-Trichloroethane	200	800	ug/l	0.28 U	0.28 U
1,1,2,2-Tetrachloroethane	--	--	ug/l	0.19 U	0.19 U
1,1,2-Trichloro-1,2,2-trifluoroethane	--	5500	ug/l	0.34 U	0.34 U
1,1,2-Trichloroethane	--	--	ug/l	0.08 U	0.08 U
1,1-Dichloroethane	--	2.8	ug/l	0.24 U	0.24 U
1,1-Dichloroethene	--	--	ug/l	0.34 U	0.34 U
1,2,3-Trichlorobenzene	--	0.7	ug/l	0.35 U	0.35 U
1,2,4-Trichlorobenzene	--	0.4	ug/l	0.27 U	0.27 U
1,2-Dibromo-3-Chloropropane	0.2	0.00033	ug/l	0.23 UJ	0.23 UJ
1,2-Dichlorobenzene	600	30	ug/l	0.22 U	0.22 U
1,2-Dichloroethane	5	0.17	ug/l	0.25 U	0.25 U
1,2-Dichloropropane	5	0.44	ug/l	0.18 U	0.18 U
1,3-Dichlorobenzene	--	--	ug/l	0.33 U	0.33 U
1,4-Dichlorobenzene	75	0.48	ug/l	0.33 U	0.33 U
2-Butanone (MEK)	--	560	ug/l	2.2 U	2.2 U
2-Hexanone	--	3.8	ug/l	0.72 U	0.72 U
4-Methyl-2-pentanone (MIBK)	--	630	ug/l	0.63 U	0.63 U
Acetone	--	1400	ug/l	18	12
Benzene	5	0.46	ug/l	0.19 U	0.19 U
Bromoform	80	3.3	ug/l	0.18 U	0.18 UJ
Bromomethane	--	0.75	ug/l	0.18 UJ	0.18 UJ
Carbon disulfide	--	81	ug/l	0.22 U	0.22 U
Carbon tetrachloride	5	0.46	ug/l	0.33 U	0.33 U
Chlorobenzene	7.8	100	ug/l	0.24 U	0.24 U
Chlorobromomethane	--	8.3	ug/l	0.3 U	0.3 U
Chlorodibromomethane	80	0.87	ug/l	0.22 U	0.22 U
Chloroethane	--	2100	ug/l	0.37 U	0.37 U
Chloroform	80	0.22	ug/l	0.22 U	0.22 U
Chloromethane	--	19	ug/l	0.22 U	0.22 U
cis-1,2-Dichloroethene	--	--	ug/l	0.26 U	0.26 U
cis-1,3-Dichloropropene	--	--	ug/l	0.16 U	0.16 U
Cyclohexane	--	1300	ug/l	0.26 U	0.26 U
Dichlorobromomethane	80	0.13	ug/l	0.15 U	0.15 U
Dichlorodifluoromethane	--	20	ug/l	0.14 U	0.14 U
Ethylbenzene	700	1.5	ug/l	0.3 U	0.3 U
Ethylene Dibromide	--	--	ug/l	0.19 U	0.19 U
Isopropylbenzene	--	--	ug/l	0.32 U	0.32 U
Methyl acetate	--	2000	ug/l	0.58 U	0.58 UJ
Methyl tert-butyl ether	--	14	ug/l	0.13 U	0.13 U

Table 5. Volatile Organic Compounds in Concrete Leachate
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01A
			Sample Date	8/10/2017	9/1/2017
			Sample Type	N	N
			Sample Type	Stockpile 1 Validated	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601402781
Analyte	EPA Risk Based Screening Level Drinking water MCL	EPA Risk Based Screening Level Tapwater RSL	Unit		
Methylcyclohexane	--	--	ug/l	0.22 U	0.22 U
Methylene Chloride	**5**	11	ug/l	**45**	**42**
m-Xylene & p-Xylene	--	--	ug/l	0.91 J	0.28 U
o-Xylene	--	19	ug/l	0.43 J	0.32 U
Styrene	100	120	ug/l	0.17 U	0.17 U
Tetrachloroethene	--	--	ug/l	0.36 U	0.36 U
Toluene	1000	110	ug/l	1	0.25 U
trans-1,2-Dichloroethene	--	--	ug/l	0.18 U	0.18 U
trans-1,3-Dichloropropene	--	--	ug/l	0.19 U	0.19 U
Trichloroethene	--	--	ug/l	0.22 U	0.22 U
Trichlorofluoromethane	--	520	ug/l	0.15 U	0.15 U
Vinyl chloride	2	0.019	ug/l	0.2 U	0.2 U

Table 6. Semivolatile Organic Compounds in Concrete Leachate
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01	CFSP-01A
			Sample Date	8/10/2017	8/10/2017	9/1/2017
			Sample Type	N	N	N
			Sample Type	Stockpile1 Validated	Stockpile 1 Reanalysis	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601390132	4601402781
Analyte	EPA Risk Based Screening Level Drinking water MCL	EPA Risk Based Screening Level Tapwater RSL	Unit			
1,1'-Biphenyl	--	0.083	ug/l	0.63 U	0.63 U	0.63 U
1,2,4,5-Tetrachlorobenzene	--	0.17	ug/l	0.43 U	0.43 U	0.43 U
1,4-Dioxane	--	0.46	ug/l	3.1 U	3.1 U	3.1 U
2,2'-oxybis[1-chloropropane]	--	--	ug/l	0.93 U	0.93 U	0.93 U
2,3,4,6-Tetrachlorophenol	--	24	ug/l	0.69 U	0.69 U	0.69 U
2,4,5-Trichlorophenol	--	120	ug/l	0.49 U	0.49 U	0.49 U
2,4,6-Trichlorophenol	--	1.2	ug/l	0.53 U	0.53 U	0.53 U
2,4-Dichlorophenol	--	4.6	ug/l	0.63 U	0.63 U	0.63 U
2,4-Dimethylphenol	--	36	ug/l	0.91 U	0.91 U	0.91 U
2,4-Dinitrophenol	--	3.9	ug/l	2.4 U	2.4 U	2.4 U
2,4-Dinitrotoluene	--	0.24	ug/l	1 U	1 U	1 U
2,6-Dinitrotoluene	--	0.049	ug/l	0.88 U	0.88 U	0.88 U
2-Chloronaphthalene	--	--	ug/l	0.61 U	0.61 U	0.61 U
2-Chlorophenol	--	9.1	ug/l	0.74 U	0.74 U	0.74 U
2-Methylnaphthalene	--	3.6	ug/l	0.88 U	1.7 J	2.4 J
2-Methylphenol	--	--	ug/l	1.3 U	1.3 U	1.3 U
2-Nitroaniline	--	19	ug/l	0.65 U	0.65 U	0.65 U
2-Nitrophenol	--	--	ug/l	0.59 U	0.59 U	0.59 U
3 & 4 Methylphenol	--	--	ug/l	0.88 U	0.88 U	0.88 U
3,3'-Dichlorobenzidine	--	0.13	ug/l	1 U	1 U	1 U
3-Nitroaniline	--	--	ug/l	0.82 U	0.82 U	0.82 U
4,6-Dinitro-2-methylphenol	--	--	ug/l	2 U	2 U	2 U
4-Bromophenyl phenyl ether	--	--	ug/l	1 U	1 U	1 U
4-Chloro-3-methylphenol	--	--	ug/l	0.76 U	0.76 U	0.76 U
4-Chloroaniline	--	0.37	ug/l	0.73 U	0.73 U	0.73 U
4-Chlorophenyl phenyl ether	--	--	ug/l	0.96 U	0.96 U	0.96 U
4-Nitroaniline	--	3.8	ug/l	0.48 U	0.48 U	0.48 U
4-Nitrophenol	--	--	ug/l	4.7 U	4.7 U	4.7 U
Acenaphthene	--	53	ug/l	0.88 U	0.88 U	0.88 U
Acenaphthylene	--	--	ug/l	0.65 U	0.65 U	0.65 U
Acetophenone	--	190	ug/l	1 U	1 U	1 U
Anthracene	--	180	ug/l	0.57 U	1 J	0.57 U
Atrazine	3	0.3	ug/l	0.77 UJ	0.77 U	0.77 U
Benzaldehyde	--	190	ug/l	0.86 U	0.86 U	0.86 U
Benzo[a]anthracene	--	--	ug/l	0.55 U	0.58 J	0.55 U
Benzo[a]pyrene	0.2	0.0034	ug/l	0.16 U	0.16 U	0.16 U
Benzo[b]fluoranthene	--	0.034	ug/l	0.44 U	0.7 J	0.44 U
Benzo[g,h,i]perylene	--	--	ug/l	0.75 U	0.75 U	0.75 U
Benzo[k]fluoranthene	--	0.34	ug/l	0.18 U	0.18 U	0.18 U

Table 6. Semivolatile Organic Compounds in Concrete Leachate
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01	CFSP-01A
			Sample Date	8/10/2017	8/10/2017	9/1/2017
			Sample Type	N	N	N
			Sample Type	Stockpile1 Validated	Stockpile 1 Reanalysis	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601390132	4601402781
Analyte	EPA Risk Based Screening Level Drinking water MCL	EPA Risk Based Screening Level Tapwater RSL	Unit			
1,1'-Biphenyl	--	0.083	ug/l	0.63 U	0.63 U	0.63 U
Bis(2-chloroethoxy)methane	--	5.9	ug/l	0.69 U	0.69 U	0.69 U
Bis(2-chloroethyl)ether	--	0.014	ug/l	0.12 U	0.12 U	0.12 U
Bis(2-ethylhexyl) phthalate	5.6	6	ug/l	0.72 U	1.7 J	0.72 U
Butyl benzyl phthalate	--	16	ug/l	0.6 U	0.6 U	0.6 U
Caprolactam	--	990	ug/l	1.1 UJ	1.1 U	1.1 U
Carbazole	--	--	ug/l	22	29	3.2 J
Chrysene	--	3.4	ug/l	0.67 U	0.67 U	0.67 U
Dibenz(a,h)anthracene	--	0.0034	ug/l	0.09 U	0.09 U	0.09 U
Dibenzofuran	--	0.79	ug/l	0.85 U	0.85 U	0.85 U
Diethyl phthalate	--	--	ug/l	1 U	1 U	1 U
Dimethyl phthalate	--	--	ug/l	0.98 U	0.98 U	0.98 U
Di-n-butyl phthalate	--	--	ug/l	0.82 U	1.2 J	0.82 U
Di-n-octyl phthalate	--	20	ug/l	0.69 U	0.69 U	0.69 U
Fluoranthene	--	80	ug/l	2.7 J	4.2 J	0.72 U
Fluorene	--	29	ug/l	0.8 U	0.8 U	0.8 U
Hexachlorobenzene	1	0.0098	ug/l	0.47 U	0.47 U	0.47 U
Hexachlorobutadiene	--	0.14	ug/l	0.76 U	0.76 U	0.76 U
Hexachlorocyclopentadiene	50	0.041	ug/l	0.61 UJ	0.61 U	0.61 UJ
Hexachloroethane	--	0.33	ug/l	0.09 U	0.09 U	0.09 U
Indeno[1,2,3-cd]pyrene	--	0.034	ug/l	0.21 U	0.21 U	0.21 U
Isophorone	--	78	ug/l	0.67 U	0.67 U	0.67 U
Naphthalene	--	0.17	ug/l	0.8 U	0.8 U	0.8 U
Nitrobenzene	--	0.14	ug/l	0.49 U	0.49 U	0.49 U
N-Nitrosodi-n-propylamine	--	0.011	ug/l	0.83 U	2.8	0.83 U
N-Nitrosodiphenylamine	--	12	ug/l	0.74 U	0.74 U	0.74 U
Pentachlorophenol	1	0.041	ug/l	2.2 U	2.2 U	2.2 U
Phenanthrene	--	--	ug/l	2.2 J	3.2 J	1.5 J
Phenol	--	580	ug/l	0.41 U	0.65 J	0.41 U
Pyrene	--	12	ug/l	0.83 U	3.1 J	0.83 U

Table 7. Metals in Concrete Leachate
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01	CFSP-01A
			Sample Date	8/10/2017	8/10/2017	9/1/2017
			Sample Type	N	N	N
			Sample Type	Stockpile1 Validated	Stockpile 1 Reanalysis	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601390132	4601402781
Analyte	EPA Risk Based Screening Level Drinking water MCL	EPA Risk Based Screening Level Tapwater RSL	Unit			
Aluminum	--	2000	ug/l	5190	4850	1110
Antimony	6	0.78	ug/l	1.2 J	1.4 J	0.62 U
Arsenic	10	0.052	ug/l	0.64 U	0.64 U	0.64 U
Barium	2000	380	ug/l	64.6	51.7	193
Beryllium	4	2.5	ug/l	0.24 U	0.24 U	0.24 U
Cadmium	--	--	ug/l	0.71 U	0.71 U	0.71 U
Calcium	--	--	ug/l	158000	135000 B	268000
Chromium	100	2200	ug/l	52	55.6	15.9
Cobalt	--	0.6	ug/l	1.3 U	1.3 U	1.3 U
Copper	1300	80	ug/l	6.7	5	7.5
Cyanide, Free	200	0.15	ug/l	1.5 R	1.5 U	1.5 U
Iron	--	1400	ug/l	42.4 U	42.4 U	92.2 J
Lead	15	15	ug/l	5.6	2.2	0.95 J
Magnesium	--	--	ug/l	63.6 U	63.6 U	77.8 J
Manganese	--	--	ug/l	2.5 U	2.5 U	2.5 U
Mercury	2	0.063	ug/l	0.17 U	0.17 U	0.17 U
Nickel	--	--	ug/l	1.4 U	1.4 U	1.4 U
Potassium	--	--	ug/l	14900	12800	15000
Selenium	50	10	ug/l	0.73 U	0.73 U	0.73 U
Silver	--	9.4	ug/l	1.3 U	1.3 U	1.3 U
Sodium	--	--	ug/l	48100	42400	13800
Thallium	2	0.02	ug/l	0.26 U	0.26 U	0.26 U
Vanadium	--	8.6	ug/l	1.9 U	2.5 J	1.9 U
Zinc	--	600	ug/l	7 U	7 U	7.4 J

Total chromium results are compared to Chromium (III) EPA Tapwater RSL and Total Chromium EPA MCL.

Table 8. Polychlorinated Biphenyl in Concrete Leachate
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01A
			Sample Date	8/10/2017	9/1/2017
			Sample Type	N	N
			Sample Type	Stockpile1 Validated	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601402781
Analyte	EPA Risk Based Screening Level Drinking water MCL	EPA Risk Based Screening Level Tapwater RSL	Unit		
Aroclor 1016	--	0.14	ug/l	0.1 U	0.1 U
Aroclor 1221	--	0.0047	ug/l	0.1 U	0.1 U
Aroclor 1232	--	0.0047	ug/l	0.1 U	0.1 U
Aroclor 1242	--	0.0078	ug/l	0.1 U	0.1 U
Aroclor 1248	--	0.0078	ug/l	0.1 U	0.1 U
Aroclor 1254	--	0.0078	ug/l	0.099 U	0.099 U
Aroclor 1260	--	0.0078	ug/l	0.099 U	0.099 U
Aroclor 1268	--	--	ug/l	0.099 U	0.099 U
Aroclor-1262	--	--	ug/l	0.099 U	0.099 U
Polychlorinated biphenyls, Total	--	--	ug/l	0.1 U	0.1 U

Table 9. General Chemistry in Concrete Leachate
Columbia Falls Aluminum Company, LLC, 2000 Aluminum Drive, Columbia Falls, MT

			Sample Location	CFSP-01	CFSP-01	CFSP-01A
			Sample Date	8/10/2017	8/10/2017	9/1/2017
			Sample Type	N	N	N
			Sample Type	Stockpile1 Validated	Stockpile 1 Reanalysis	Stockpile 1 Resample Validated
			Lab Group	4601390131	4601390132	4601402781
Analyte	EPA Risk Based Screening Level Drinking water MCL	EPA Risk Based Screening Level Tapwater RSL	Unit			
Fluoride	**4000**	80	ug/l	**11100 J+**	**11400 D**	1020

FIGURE

1. Crushed Concrete Sample Locations

CONCENTRATION LEGEND

CRUSHED CONCRETE PILES

NOTES

CONCRETE PILES DELINEATED ON AUGUST 8, 2017

50 0 50 100 Feet

Title:

CRUSHED CONCRETE PILES

2000 ALUMINUM DRIVE
COLUMBIA FALLS, MONTANA

Prepared For:

COLUMBIA FALLS ALUMINUM COMPANY, LLC

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: M.R.	Date: 26OCT17	FIGURE
Prepared by: M.R.	Scale: AS SHOWN	1
Project Mgr: M.R.	Project: 2476.0001Y002	
File: 2476.0001Y194.1.mxd		

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