



Wharf Resources (USA), Inc.

June 19, 2020

Mr. Eric Holm
SD DENR
Minerals & Mining Program
Joe Foss Building
523 East Capitol Avenue
Pierre, SD 57501

RE: State Mine Permit No. 476, 356, 434, 435, and 464 Technical Revision—Ruby Dump

Dear Eric:

Enclosed please find a technical revision for the proposed Ruby Dump for discard (waste) material at Wharf Mine. Approximately 3.4 million tons of waste rock from the Portland Ridgeline and Flossie pits would be hauled to the proposed Ruby Dump. Wharf is requesting use of the Ruby Dump for Portland and Flossie waste rock in order to aid mining progression and shorten the waste hauls out of the pits.

There will be no changes to current haul roads in order to utilize the Ruby Dump. Topsoil from the Ruby Dump will be hauled to the Juno topsoil stockpile or be used for final reclamation that may be taking place concurrently at the time the Ruby topsoil is stripped. Any potential ARD material placed in the dump will be blended according to Wharf's existing ARD management plan. All runoff will be directed to existing storm water and sediment controls and will remain inside the permit boundary.

Approximately 420,000 tons of waste rock placed in the Ruby Dump will be placed on the 33V denitrification liner. This section of the liner is currently covered with backfill from previous mining activity, and 533,118 tons of spent ore on the 33V liner would ultimately be covered by the Ruby Dump. A map that shows this overlap is enclosed, as is an updated copy of the Juno-Foley checkbook which shows the addition of this material to the lined area tracking. Approximately 2.3 tons of material would be in the Juno-Foley POP but off liner. This is also shown in the Juno-Foley checkbook. After the Ruby Dump is complete, the Juno-Foley checkbook will be approximately 87% loaded with nitrates and 41.9% loaded with arsenic. Finally, approximately 713,000 tons of waste rock placed in the Ruby Dump will be in the Reliance Depository; this volume amounts to 0.526 tons of nitrates and would bring the Reliance Depository to 14.04 tons of nitrate; it is permitted for 18.1 tons of nitrate.

Once full, the Ruby Dump will be graded, sloped, covered with topsoil and seeded for reclamation purposes. The total reclamation footprint is 23.2 acres and will include 103, 149 cubic yards of material to be moved. The dump includes 10.6 acres of currently disturbed land,

10.5 acres of redisturbed land, and 2.1 acres of new disturbance. This 2.1 acres of new disturbance is new contiguous affected acreage under Mine Permit 356.

A table with the information required pursuant to 74:29:03:03 is enclosed. A map showing the location of the proposed Ruby Dump (including relation to the permit boundary and current disturbance boundary and fill contours) and four cross section maps showing current, fill, and reclaimed topographies are also enclosed. Shape files will be provided to DENR electronically.

Please contact me at 605-584-4112 if you have any comments or questions.

Sincerely,

Matt Zietlow
Environmental Manager

cc: Roberta Hudson (SD DENR), Stan Michals (SD GF&P), Amber Vogt (Lawrence County)

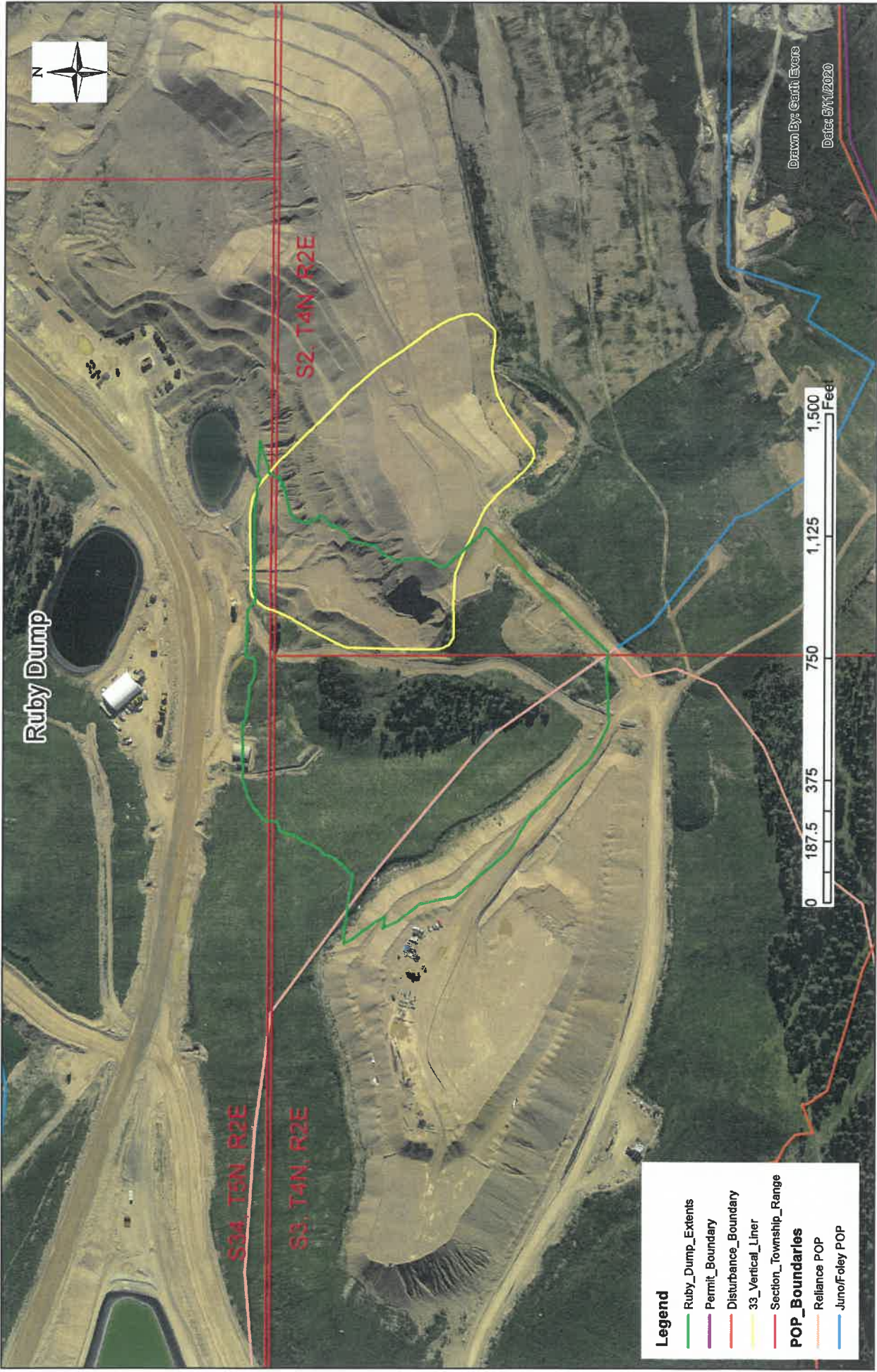
Technical Revision Checklist (Regulatory Requirement 74:29:03:03)
Ruby Dump

	Item	Description
(1)	Name:	Wharf Resources (U.S.A.), Inc. 10928 Wharf Road Lead, South Dakota 57754
	Contact:	Matt Zietlow Environmental Manager
(2)	Permit No.	State Mine Permit Nos. 476, 356, 434, 435, and 464.
(3)	Narrative Description:	Wharf Resources is requesting approval to haul waste rock from the Flossie and Portland Ridgeline Pits to the proposed Ruby Dump.
(4)	Legal Description:	Sections 2 and 3; T4N, R2E, B.H.M. and Section 34; T5N, R2E, B.H.M.
(5)	Reference Material/Maps:	Reference the attached maps for proposed Ruby Dump area and dump cross sections.
(6)	Cost of Reclamation:	\$51,094
(7)	Description of Reclamation:	When full, the Ruby Dump will be graded, sloped, covered with topsoil, and seeded per the existing mine reclamation plan.
(8)	Surface Owners:	Wharf Resources (U.S.A.), Inc. 10928 Wharf Road Lead, SD 57754
(9)	Mineral Owners:	Wharf Resources (U.S.A.), Inc. 10928 Wharf Road Lead, SD 57754
(10)	Proof of Consultation Adjacent Landowners:	Wharf owns the land where the Ruby Dump is located; no adjacent landowners located within notification radius.

- (11) **Proof of Consultation
Governmental Agencies:** SD Game Fish and Parks will be included in the distribution of this technical revision request. Please reference the June 10, 1988 letter on file for proof of consultation with the Lawrence County NRCS office.
- (12) **Proof of Compliance
with Local Zoning:** Lawrence County will be included in the distribution of this technical revision request.
- (13) **Post-Mining
Reclamation Map:** Refer to the post mine contour map for 2022 (provided electronically).
- (14) **Effect on Timetable:** There is no impact to the timetable.
- (15) **Baseline Data and Maps:** Reference State Mine Permit Nos. 476, 356, 434, 435, and 464 including subsequent amendments and technical revisions.

JUNO/FOLEY ARSENIC AND NITRATE LOADING (GWD 1-98)

Year	Pad #	Spent Ore Offloaded (tons)	Moisture Content (%)	Arsenic				Nitrates + Nitrites	
				As	As in Fluid	As on Solids	Total As	Nitrogen (mg/L)	Total Nitrogen (tons)
				(mg/L)	(tons)	(tons)	(tons)		
1997	3.4	2,319,916	6.93	1.232	0.198	2.144	2.342	111.05	17.854
1997	4.4	1,432,051	6.62	2.023	0.192	2.173	2.365	102.00	9.670
1997	1.5	1,565,682	7.75	1.938	0.235	2.276	2.511	110.82	13.447
1998	2.5	1,908,481	6.65	2.291	0.291	3.279	3.570	56.57	7.180
1998	3.5	2,158,356	6.94	1.594	0.239	2.580	2.819	100.11	14.995
1999	4.5	1,420,987	7.02	2.792	0.279	2.976	3.254	54.31	5.418
1999	1.6	1,496,996	7.01	2.811	0.295	3.156	3.451	45.57	4.782
1999-2000	2.6	2,024,559	6.26	1.627	0.206	2.470	2.677	99.16	12.567
2000	3.6	322,596	6.60	1.993	0.042	0.482	0.525	55.62	1.184
2000	3.6	1,785,119	6.40	2.243	0.256	3.003	3.259	35.51	4.057
2000	4.6	1,207,048	6.50	2.218	0.174	2.008	2.182	40.04	3.141
2001	1.7	1,574,854	6.57	1.471	0.152	1.737	1.890	61.67	6.381
2001	2.7	1,941,158	7.18	1.444	0.201	2.102	2.304	89.82	12.519
2001-2002	3.7	2,048,319	7.61	0.790	0.123	1.214	1.337	122.56	19.104
2002	4.7	1,261,179	7.27	0.516	0.047	0.488	0.535	114.37	10.486
2002	1.8	1,457,378	7.39	0.401	0.043	0.438	0.481	155.90	16.790
2002	1.8	35,077	7.39	0.401	0.001	0.011	0.012	155.90	0.404
2003	2.8	895,630	6.25	0.906	0.051	0.609	0.659	107.62	6.024
2003	2.8	1,091,637	6.25	0.906	0.062	0.742	0.804	107.62	7.343
2003	3.8	140,000	7.37	0.282	0.003	0.030	0.033	185.95	1.919
2003	3.8	40,000	7.37	0.282	0.001	0.008	0.009	185.95	0.548
2003	3.8	1,943,300	7.37	0.282	0.040	0.411	0.451	185.95	26.632
2004	4.8	1,483,477	7.06	0.132	0.014	0.147	0.161	271.38	28.423
2004	1.9	1,287,077	7.36	0.148	0.014	0.143	0.157	211.18	20.005
2004	1.9	218,166	7.36	0.148	0.002	0.024	0.027	211.18	3.391
2005	2.9	1,742,293	8.07	0.297	0.042	0.388	0.430	116.21	16.339
2005	2.9	63,010	8.07	0.297	0.002	0.014	0.016	116.21	0.591
2005	3.9	2,082,797	7.86	0.444	0.073	0.694	0.766	125.41	20.531
2006	4.9	46,982	7.48	0.275	0.001	0.010	0.011	113.74	0.400
2006	4.9	1,298,038	7.48	0.275	0.027	0.268	0.294	113.74	11.043
2006	1.10	18,731	7.76	0.554	0.001	0.008	0.009	106.78	0.155
2006	1.10	648,604	7.76	0.554	0.028	0.269	0.297	106.78	5.374
2007	1.10	935,867	8.58	0.554	0.044	0.389	0.433	106.78	8.574
2009	3.10	2,221,553	6.61	0.200	0.029	0.333	0.250	92.65	13.605
2010	2.11	2,999,487	8.76	0.159	0.042	0.358	0.399	122.10	32.082
2011	5.1	2,694,463	7.62	0.350	0.072	0.707	0.779	126.59	25.991
2011	4.10	844,068	8.17	0.155	0.011	0.098	0.109	184.45	12.720
2011-2012	3.11	1,810,252	7.30	0.332	0.044	0.451	0.495	133.04	17.581
2012	4.10	252,900	4.83	0.155	0.002	0.029	0.031		1.240
2017	2.14	120,121	6.74	2.210	0.018	0.199	0.217	11.55	0.094
2017	2.14	175,500	6.74	2.210	0.026	0.291	0.317	11.55	0.137
2018	5.30	28,000	4.63	1.970	0.003	0.041	0.044	12.82	0.017
Ruby 2020	Waste Rock	420,890	5.00	0.066	0.001	0.021	0.022	0.7372	0.310
Ruby 2020	Waste Rock	2,284,626	5.00	0.066	0.008	0.113	0.121	0.7372	1.684
2003	33-Vertical	65,000	gallons	0.120			0.000	49.98	0.014
2004	33-Vertical	60,000	gallons	0.016			0.000	2.80	0.001
2005	Trojan Pit	5,023,184	gallons	0.013			0.000	20.30	0.426
2006	Trojan Pit	19,925,430	gallons	0.009			0.001	17.54	1.458
2008	Polo Liner	7,118,000	gallons	0.266			0.010	3.80	0.040
Sept 2008 thru 2009	Sprays	132,620,199	gallons				0.052		0.460
2010	Sprays	77,602,475	gallons				0.037		0.503
2011	Sprays	111,610,152	gallons				0.075		3.093
2012	Sprays	55,374,000	gallons				0.030		2.189
2013	Sprays	145,182,948	gallons				0.089		11.432
2014	Sprays	171,668,291	gallons				0.190		5.102
2015	Sprays	102,906,480	gallons				0.150		11.310
2016	Sprays	34,726,080	gallons				0.048		0.032
June 2017	Sprays	12,100,000	gallons				0.044		0.431
November 2017	Sprays	10,100,000	gallons				0.030		0.164
April & May 2018	Sprays	37,200,000	gallons				0.087		0.045
July & August 2018	Sprays	24,638,400	gallons				0.086		1.042
Oct Nov & Dec 2018	Sprays	22,705,977	gallons				0.081		0.284
Apr-June 2019	Sprays	70,099,285	gallons				0.286		0.910
June-Aug 2019	Sprays	39,974,400	gallons				0.130		3.082
Nov '19-Jan '20	Sprays	39,370,000	gallons				0.027		2.059
Off Liner Totals		28,385,631	tons off liner		3.026	33.217	37.696		201.471
Juno/Foley Permitted Tons:							90.000		160.000
Tons NO3 Credit									62.150
Total Tons NO3 (Loaded - Credit)									139.321
Remaining Tons:							52.304		20.679
% Tons Loaded:							41.88		87.08
33 Vertical Liner Tons:				2,913,898	0.098	1.097	1.196		25.044
North Foley Liner Tons:				10,012,482	0.236	2.341	2.577		123.109
Polo Liner Tons:				3,834,024	0.104	1.033	1.024		27.570
33 Vertical/Polo Liner Tons:				2,999,487	0.042	0.358	0.399		32.082
Portland Denit Liner Tons:				5,601,683	0.128	1.286	1.414		57.532
Liner Totals			25,361,574		0.608	6.115	6.610		265.338



Ruby Dump

S34, T5N, R2E

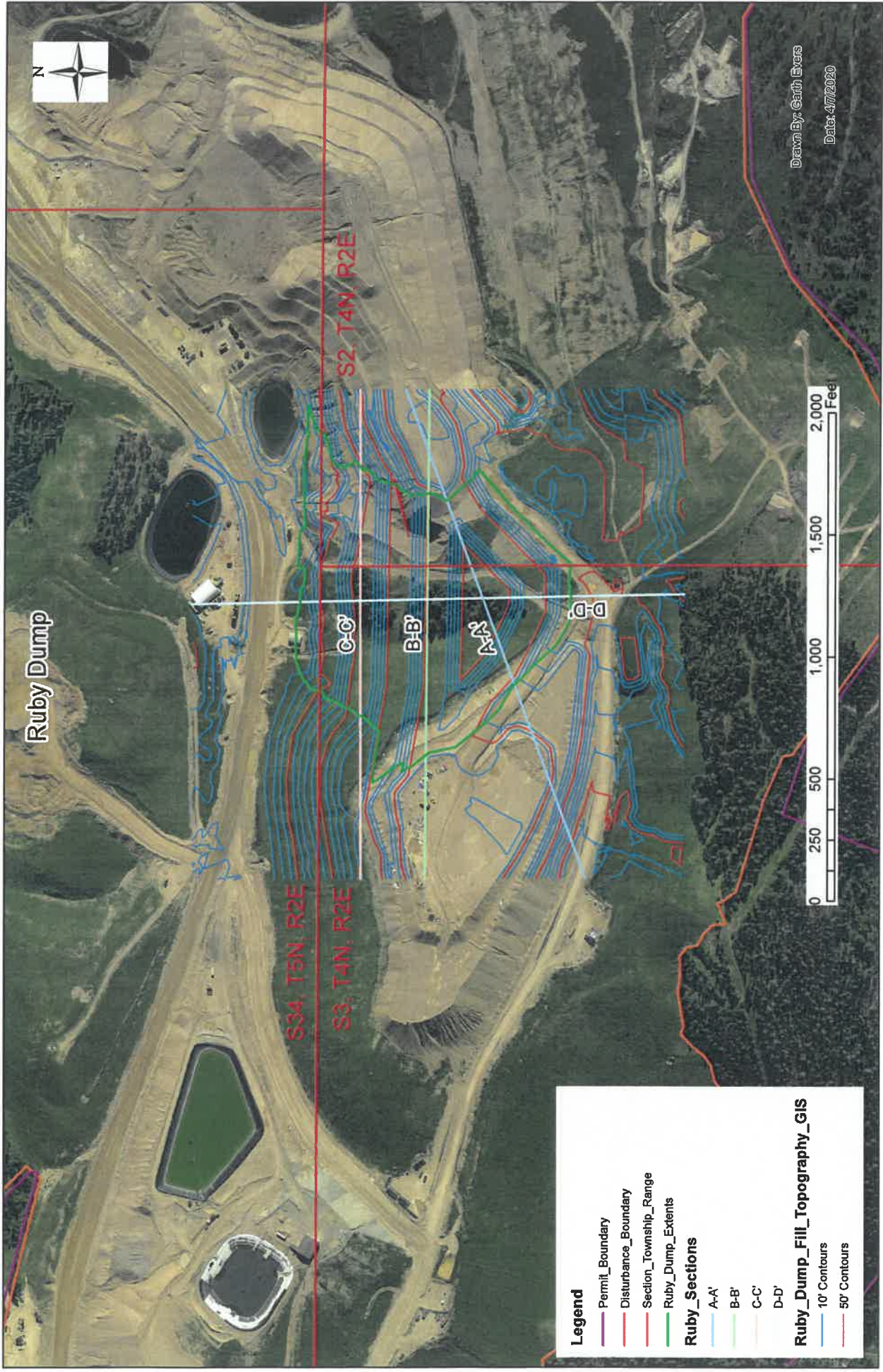
S3, T4N, R2E

S2, T4N, R2E

Drawn By: Earth Evers
Date: 3/1/2020



- Legend**
- Ruby_Dump_Extents
 - Permit_Boundary
 - Disturbance_Boundary
 - 33_Verical_Liner
 - Section_Township_Range
- POP_Boundaries**
- Reliance POP
 - Juno/Foley POP



Ruby Dump

S34, T5N, R2E
S3, T4N, R2E

S2, T4N, R2E

C-C'

B-B'

A-A'

D-D'

Legend

- Permit_Boundary
- Disturbance_Boundary
- Section_Township_Range
- Ruby_Dump_Extents

Ruby_Sections

- A-A'
- B-B'
- C-C'
- D-D'

Ruby_Dump_Fill_Topography_GIS

- 10' Contours
- 50' Contours

Drawn By: Garth Evans
Date: 4/7/2020



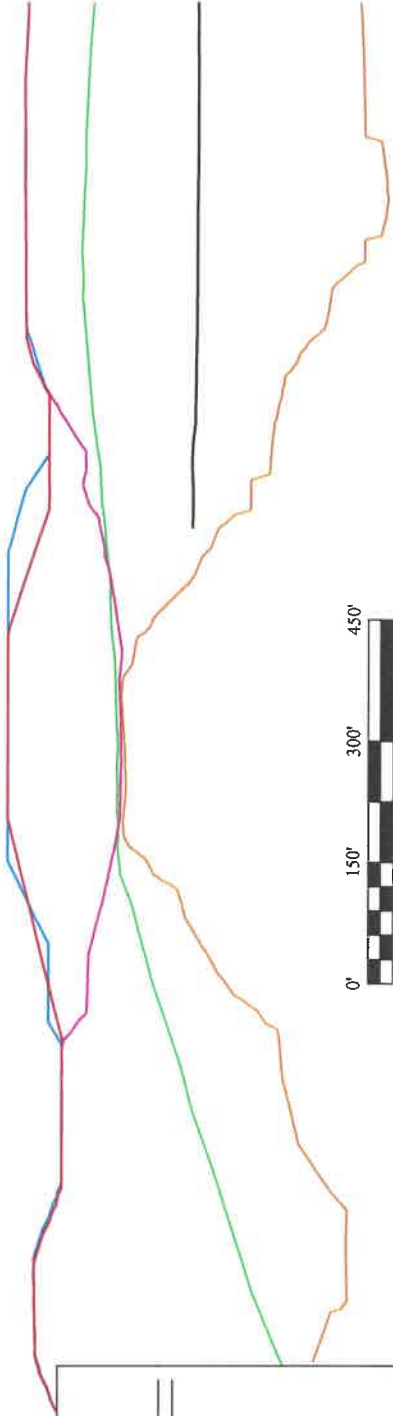
Ruby Dump - Section A-A'



LEGEND

These standard symbols will be found in the drawing.

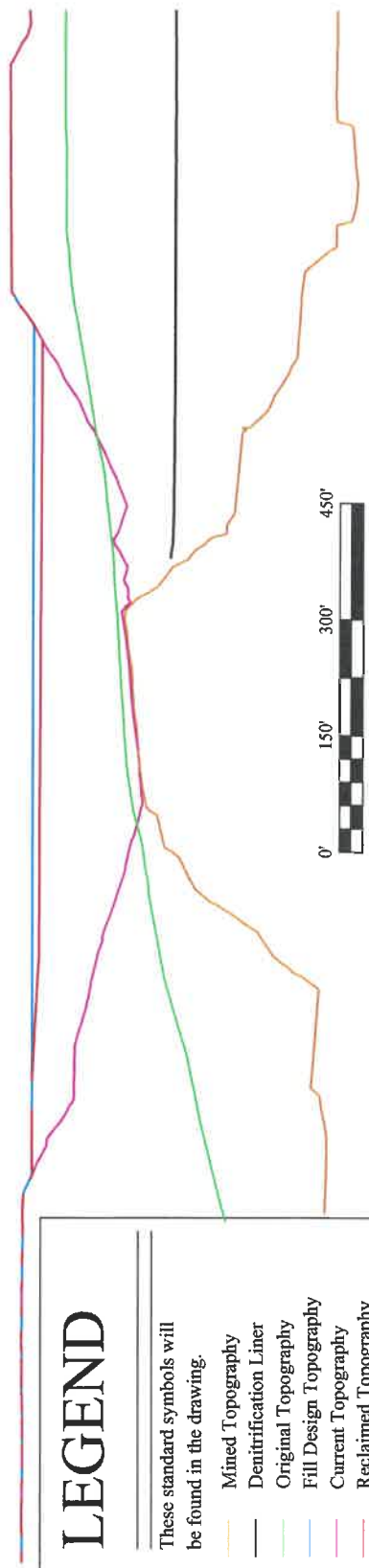
- Mined Topography
- Denitrification Liner
- Original Topography
- Fill Design Topography
- Current Topography
- Reclaimed Topography
- X-Section



Drawn By: Garth Evers
Date: 4/6/2020

Ruby Dump - Section B-B'

B B'



LEGEND

These standard symbols will be found in the drawing.

- Mined Topography
- Denitrification Liner
- Original Topography
- Fill Design Topography
- Current Topography
- Reclaimed Topography
- X-Section

Drawn By: Garth Evers
Date: 4/6/2020

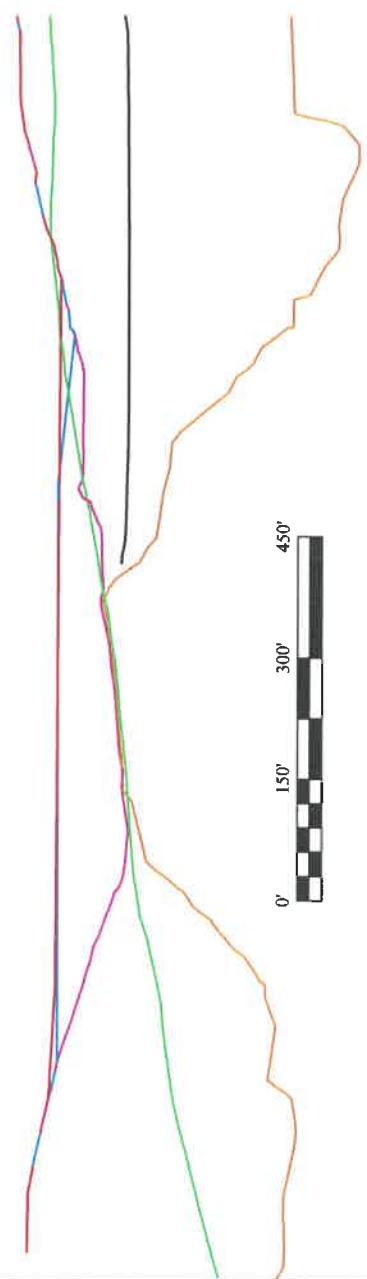
Ruby Dump - Section C-C'

C'  C

LEGEND

These standard symbols will be found in the drawing.

- Mined Topography
- Denitrification Liner
- Original Topography
- Fill Design Topography
- Current Topography
- Reclaimed Topography
- X-Section

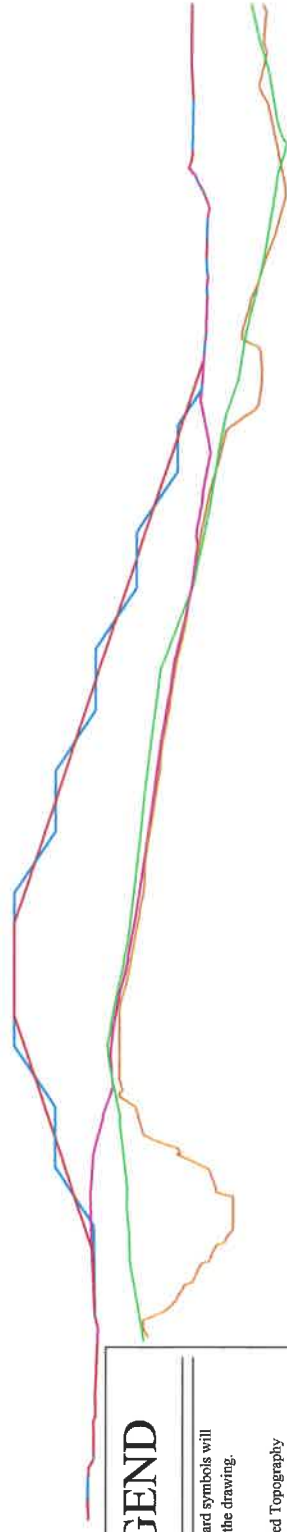


Drawn By: Garth Evers
Date: 4/6/2020

Ruby Dump - Section D-D'

D'

D



LEGEND

These standard symbols will be found in the drawing.

- Mined Topography
- Original Topography
- Fill Design Topography
- Current Topography
- Reclaimed Topography
- X-Section

Drawn By: Garth Evers
Date: 4/6/2020