

TECHNICAL MEMORANDUM

To:	Nevada Environmental Response Trust
Cc:	Nevada Division of Environmental Protection United States Environmental Protection Agency
From:	Chris Hayes and Dana Grady
Date:	November 25, 2024
Subject:	Unit 4 Source Area In-Situ Bioremediation Treatability Study Monthly Progress Report

At the direction of the Nevada Environmental Response Trust (NERT or Trust), Tetra Tech, Inc. (Tetra Tech) has prepared this memorandum to summarize Tetra Tech's progress during September 2024 toward successfully implementing the Unit 4 Source Area In-Situ Bioremediation (ISB) Treatability Study.

Task Progress Update: September 2024

Task M21 – Unit 4 Source Area ISB Treatability Study

- Current Status
 - Operations and maintenance activities for Phase 2 of the Unit 4 Source Area ISB Treatability Study began on September 8, 2022 and were completed on April 9, 2024. The treatability study, which was divided into two areas denoted as Area 1 and Area 2, was implemented in phases. For Area 1, the first phase began on September 8, 2022 and consisted of a total dissolved solids (TDS) reduction period to reduce the TDS concentrations in Area 1 deep below the TDS goal of 21,000 mg/L. The second phase for Area 1, which included carbon substrate injections for application of ISB into Area 1 intermediate and deep zones, was initiated on April 6, 2023. For Area 2, an initial TDS-reduction phase was not required. As a result, carbon substrate injections for application of ISB into Area 2 intermediate and deep zones was performed for the entire duration of treatability study operations from September 2022 to April 2024. Following system shutdown, system decommissioning activities were completed in May 2024. A layout map and construction details of all injection, monitoring, and extraction wells are provided on Figure 1 and in Table 1, respectively.
 - In April 2024, the study transitioned into the post-treatment evaluation phase to assess long-term changes in contaminant concentrations and geochemical conditions following system shut down. The post-treatment effectiveness monitoring program consisted of two quarterly sampling events. The first post-treatment effectiveness monitoring event was conducted from June 10 through June 20, 2024, and the results were presented in the previous August 2024 monthly progress report. The second and final post-treatment effectiveness monitoring event was conducted from

September 18 through September 27, 2024. Results for the September 2024 sampling event will be provided in a future monthly progress report as data become available.

- Schedule and Progress Updates
 - The final quarterly post-treatment effectiveness monitoring event was performed in September 2024 in accordance with the Work Plan Addendum. All field activities have been completed.
- Health and Safety
 - There were no health and safety incidents related to Task M21 in September 2024.

CERTIFICATION

Unit 4 Source Area In-Situ Bioremediation Treatability Study Monthly Progress Report

Nevada Environmental Response Trust Site (Former Tronox LLC Site) Henderson, Nevada

Nevada Environmental Response Trust (NERT) Representative Certification

I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of NERT. Based on my own involvement and/or my inquiry of the person or persons who manage the systems(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

not individually, but solely in his representative Signature: t of the Nevada Envi ronmental Response Trust Trustee capacity as F

Name: Jay A. Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

Title: Solely as President and not individually

Company: Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

11/25/24

Date:

CERTIFICATION

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared in a manner consistent with the current standards of the profession, and to the best of my knowledge, comply with all applicable federal, state, and local statutes, regulations, and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

Description of Services Provided:

Prepared Unit 4 Source Area In-Situ Bioremediation Treatability Study Monthly Progress Report.

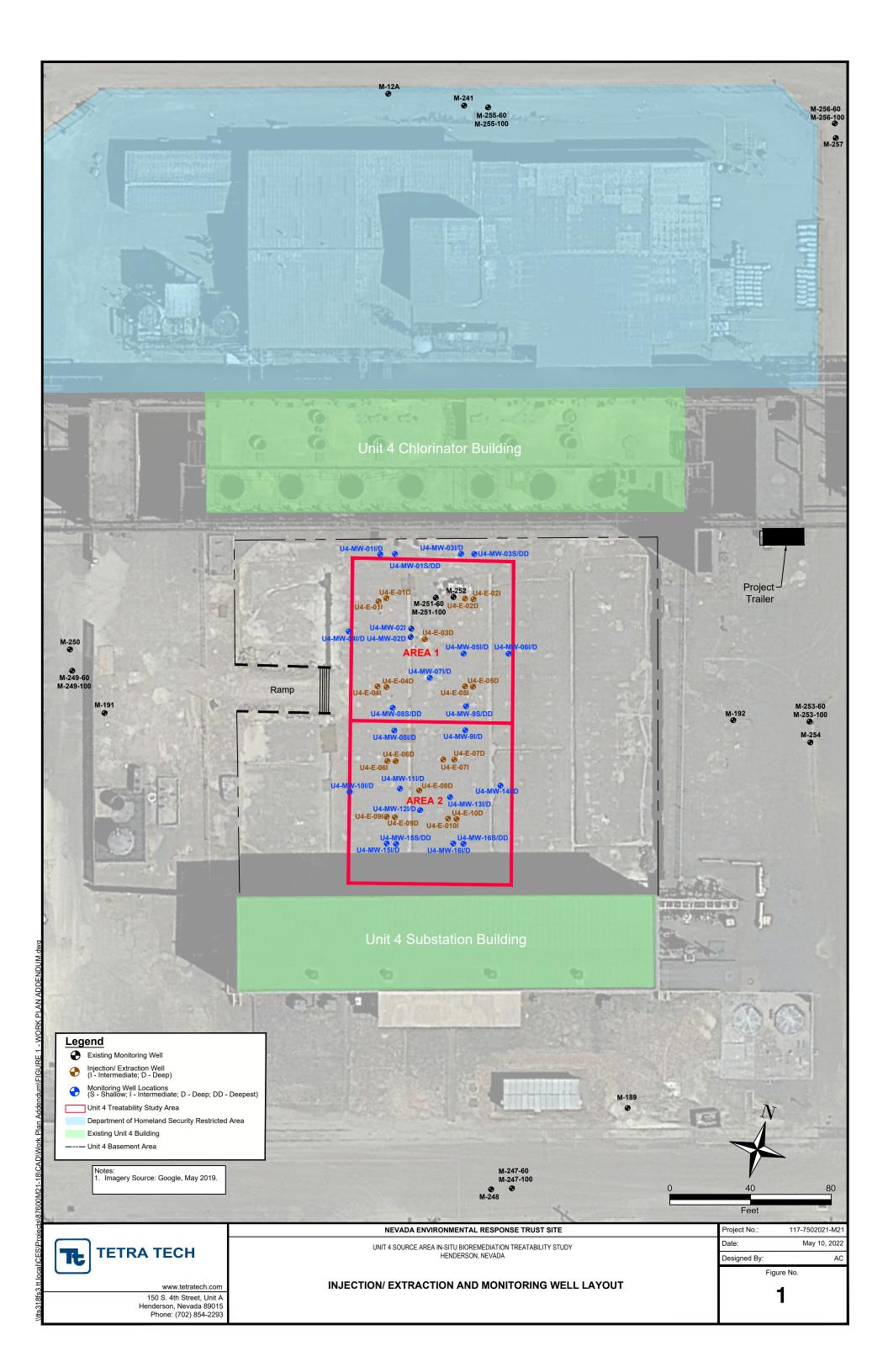
November 25, 2024

Date

Christopher Hayes, CEM Environmental Engineer Tetra Tech, Inc.

Nevada CEM Certificate Number: EM2499 Nevada CEM Expiration Date: December 15, 2024

Figure



Table

Table 1 Well Construction Details Unit 4 Source Area In-Situ Bioremediation Treatability Study

Well ID	Screened Lithology	Northing	Easting	Ground Surface Elevation ¹	Top of Casing Elevation	Construction Type	Casing Material	Screen Material	Slot Size	Filter Pack Gradation	Borehole Diameter	Borehole Total Depth	Well Diameter	Nominal Screen Length	Well Total Depth	Bottom of Screen	Top of Scree
				feet amsl	feet amsl				inches		inches	feet bgs ¹	inches	feet	feet bgs ¹	feet bgs ¹	feet bgs
I-E-01D	UMCf	26717332.49	828215.74	1805.50	1805.11	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	115.0	4	15	110.3	94.7	109
I-E-01I I-E-02D	UMCf UMCf	26717330.42 26717338.47	828212.11 828258.40	1805.40 1805.55	1805.15 1804.99	Single Single	Schedule 80 PVC Schedule 80 PVC	Stainless Steel Stainless Steel	0.010	#2/16 #2/16	8	92.0 115.0	4	15 15	90.3 110.3	74.6 94.4	89 109
I-E-02D	UMCf	26717338.14	828254.24	1805.51	1804.99	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.0	4	15	90.3	74.4	89
I-E-04D	UMCf	26717288.90	828222.53	1805.49	1804.95	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	115.0	4	15	110.3	95.0	11(
4-E-03D	UMCf	26717310.37	828241.13	1805.49	1804.94	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	113.0	4	15	111.1	110.1	95
1-E-04I	UMCf UMCf	26717288.51 26717295.64	828217.91 828264.86	1805.64 1805.48	1805.03 1804.95	Single Single	Schedule 80 PVC Schedule 80 PVC	Stainless Steel Stainless Steel	0.010	#2/16 #2/16	8	92.0 115.0	4	15 15	90.3 110.3	75.0 95.0	90 11
4-E-05D 4-E-05I	UMCf	26717295.15	828260.95	1805.58	1804.95	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.0	4	15	90.3	75.0	90
4-E-06D	UMCf	26717253.44	828232.43	1805.44	1804.74	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	112.0	4	15	111.1	110.1	95
4-E-06I	UMCf	26717252.90	828228.29	1805.47	1805.04	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.5	4	15	89.2	88.2	73
I-E-07D	UMCf	26717258.48	828261.02	1805.62	1805.31	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	111.5	4	15	110.6	109.6	94
4-E-07I 4-E-08D	UMCf UMCf	26717257.68 26717240.82	828255.56 828246.11	1805.62 1805.45	1805.16 1804.91	Single Single	Schedule 80 PVC Schedule 80 PVC	Stainless Steel Stainless Steel	0.010	#2/16 #2/16	8	92.0 120.0	4	15 15	90.7 110.6	89.7 109.6	74 94
4-E-09D	UMCf	26717225.92	828236.22	1805.45	1804.91	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	112.0	4	15	110.5	109.5	94
4-E-09I	UMCf	26717225.46	828232.18	1805.47	1805.14	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	93.3	4	15	90.9	89.9	74
4-E-10D	UMCf	26717229.55	828266.50	1805.66	1805.28	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	112.0	4	15	110.5	109.5	94
4-E-10I 4-MW-01I	UMCf UMCf	26717229.15 26717353.59	828262.34 828209.51	1805.71 1805.57	1805.37 1805.14	Single	Schedule 80 PVC Schedule 80 PVC	Stainless Steel Stainless Steel	0.010 0.010	#2/16 #2/16	8	92.0	4	15 10	90.2	89.2	74
4-MW-01D	UMCf	26717353.59	828209.25	1805.57	1805.14	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	86.7 106.7	86.7 106.7	76 96
4-MW-01S	UMCf	26717354.83	828216.42	1805.57	1805.02		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	64.7	64.7	54
4-MW-01DD	UMCf	26717354.86	828216.87	1805.57	1805.09	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	131.0	2	10	129.9	129.9	119
4-MW-02D	UMCf	26717315.33	828230.47	1805.50	1805.07	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	115.0	4	15	110.3	95.0	11(
4-MW-02I	UMCf	26717319.45	828230.17	1805.47	1805.07	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.0	4	15	90.3	75.0	90
4-MW-03I 4-MW-03D	UMCf UMCf	26717359.79 26717360.01	828248.76 828249.20	1805.61 1805.61	1805.17 1805.18	Dual-Nested	Schedule 80 PVC Schedule 80 PVC	Stainless Steel Stainless Steel	0.010	#2/16 #2/16	11	108.3	2	10 10	86.6 106.6	86.6 106.6	76 96
4-MW-03S	UMCf	26717360.79	828255.35	1805.56	1805.19		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	64.5	64.5	54
I-MW-03DD	UMCf	26717360.84	828255.62	1805.56	1805.20	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	131.3	2	10	129.7	129.7	11
4-MW-04I	UMCf	26717313.50	828199.89	1805.49	1805.13	Duel Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.5	2	10	86.8	86.8	76
4-MW-04D	UMCf	26717313.36	828199.55	1805.49	1805.15	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	I.I.	108.5	2	10	107.0	107.0	97
4-MW-05I	UMCf	26717311.18	828257.53	1805.52	1805.06	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	86.6	86.6	76
4-MW-05D	UMCf	26717311.18	828257.89	1805.52	1805.05		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	108.2	108.2	98
4-MW-06I 4-MW-06D	UMCf UMCf	26717314.46 26717314.51	828279.53 828279.82	1805.52 1805.52	1805.21 1805.20	Dual-Nested	Schedule 80 PVC Schedule 80 PVC	Stainless Steel Stainless Steel	0.010 0.010	#2/16 #2/16	11	108.3	2	10 10	86.5 107.1	86.5 107.1	76 97
4-MW-07I	UMCf	26717296.98	828242.85	1805.36	1805.16		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	86.8	86.8	76
4-MW-07D	UMCf	26717296.68	828242.80	1805.36	1805.01	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	109.2	2	10	106.5	106.5	96
4-MW-08I	UMCf	26717268.25	828229.36	1805.45	1804.97	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	88.0	88.0	78
4-MW-08D	UMCf	26717268.30	828229.62	1805.45	1804.99	Buarnoolou	Schedule 80 PVC	Stainless Steel	0.010	#2/16		100.0	2	10	108.6	108.6	98
4-MW-08S 4-MW-08DD	UMCf UMCf	26717279.33 26717279.35	828226.78 828227.22	1805.47 1805.47	1804.94 1804.95	Dual-Nested	Schedule 80 PVC Schedule 80 PVC	Stainless Steel Stainless Steel	0.010	#2/16 #2/16	11	131.2	2	10 10	64.9 129.8	64.9 129.8	54 119
4-MW-09I	UMCf	26717273.70	828264.04	1805.62	1804.95		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	86.8	86.8	76
4-MW-09D	UMCf	26717273.73	828264.40	1805.62	1805.20	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	106.9	106.9	96.
4-MW-09S	UMCf	26717285.44	828262.62	1805.55	1805.12	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	132.0	2	10	65.3	65.3	55.
4-MW-09DD	UMCf	26717285.52	828263.00	1805.55	1805.12	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16		102.0	2	10	129.8	129.8	119
4-MW-10I	UMCf UMCf	26717234.83	828212.05 828212.26	1805.55 1805.55	1805.10 1805.07	Dual-Nested	Schedule 80 PVC Schedule 80 PVC	Stainless Steel Stainless Steel	0.010	#2/16	11	109.0	2	10	87.1	87.1	77.
4-MW-10D 4-MW-11I	UMCf	26717235.18 26717240.19	828236.42	1805.55	1805.07		Schedule 80 PVC	Stainless Steel	0.010 0.010	#2/16 #2/16			2	10 10	106.9 87.0	106.9 87.0	96. 77.
4-MW-11D	UMCf	26717240.23	828236.77	1805.41	1805.05	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	109.0	2	10	107.4	107.4	97
4-MW-12I	UMCf	26717231.25	828247.87	1805.47	1805.11	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	86.8	86.8	76
4-MW-12D	UMCf	26717231.22	828248.29	1805.47	1805.12	Dual-Nesleu	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	107.1	107.1	97
4-MW-13I	UMCf	26717242.66	828261.00	1805.64	1805.28	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	109.0	2	10	87.1	87.1	77
4-MW-13D 4-MW-14I	UMCf UMCf	26717242.70	828261.37 828285.32	1805.64 1805.43	1805.35 1805.13		Schedule 80 PVC	Stainless Steel	0.010	#2/16 #2/16			2	10 10	108.2 87.3	108.2 87.3	98 77
⊩MW-14I I-MW-14D	UMCf	26717249.26 26717249.24	828285.32 828285.84	1805.43	1805.13	Dual-Nested	Schedule 80 PVC Schedule 80 PVC	Stainless Steel Stainless Steel	0.010	#2/16 #2/16	11	109.0	2	10	87.3	87.3	97
4-MW-15I	UMCf	26717212.34	828233.91	1805.48	1805.03	Duch	Schedule 80 PVC	Stainless Steel	0.010	#2/16		400.0	2	10	86.8	86.8	76
4-MW-15D	UMCf	26717212.35	828234.41	1805.48	1804.97	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	109.0	2	10	106.0	106.0	96
4-MW-15S	UMCf	26717212.89	828238.61	1805.44	1805.05	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	132.0	2	10	64.8	64.8	54
4-MW-15DD	UMCf	26717212.87	828239.01	1805.44	1804.98		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	130.3	130.3	12
I-MW-16I I-MW-16D	UMCf UMCf	26717217.25 26717217.40	828266.62 828266.90	1805.68 1805.68	1805.36 1805.27	Dual-Nested	Schedule 80 PVC Schedule 80 PVC	Stainless Steel Stainless Steel	0.010	#2/16 #2/16	11	108.5	2	10 10	87.0 106.8	87.0 106.8	77
I-MW-16D I-MW-16S	UMCf	26717217.40	828266.90	1805.68	1805.27	_	Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	106.8 64.8	106.8 64.8	54
4-MW-16DD	UMCf	26717218.04	828271.95	1805.59	1805.32	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	131.0	2	10	130.8	130.8	12
otes nsl - above mean s is - below ground s OC - below top of /C - polyvinyl chlori MCf - Upper Muddy	eurface casing ide / Creek formation	e floor of the Unit 4 ba			1	·											