



DEPARTMENT OF THE ARMY
CAMP STANLEY STORAGE ACTIVITY, MCAPP
25800 RALPH FAIR ROAD, BOERNE, TX 78015-4800

June 7, 2018

U-037-18

SUBJECT: Annual Status Report (Month 121 – Month 132, May 1, 2017 - April 30, 2018) of the Pilot Study Class V Aquifer Remediation Injection Wells at Camp Stanley Storage Activity, Boerne, Texas, TCEQ Authorization No. 5X2600431; WWC12002216; CN602728206/RN104431655

Mr. Bryan Smith
Texas Commission on Environmental Quality
Industrial and Hazardous Waste Permits Section
P.O. Box 13087 (MC-130)
Austin, TX 78711-3087

Dear Mr. Smith:

The Camp Stanley Storage Activity (CSSA), McAlester Army Ammunition Plant, U.S. Army Field Support Command, Army Material Command, U.S. Army, is submitting this annual report summarizing the injection activities performed at the on-post Solid Waste Management Unit (SWMU) B-3 site. The activities performed are part of the planned SWMU B-3 Corrective Measures to treat chlorinated compounds in groundwater via enhanced anaerobic biodegradation (EAB). Bioreactor activities include the injection of recovered groundwater and lactate into mulch/gravel filled bioreactor trenches. Additional activities associated with this authorization include the injection substrates, including lactate and emulsified vegetable oil (EVO), within four injection wells at the site.

This annual report contains data as specified by the Texas Commission on Environmental Quality (TCEQ) Underground Injection Control (UIC) permit for the months of May 2017 through April 2018 (Months 121-132). The annual reporting data includes quarterly samples of the injected groundwater for volatile organic concentrations (VOCs) and total dissolved solids (TDS) and field collected parameters including injection volumes, injection pressures and the pH of recovered groundwater, and volumes of injected substrates within injection wells. Data indicates that concentrations of contaminants did not exceed limits specified in 40 CFR §261.24 Table 1 as referenced in CSSA's UIC permit authorization.

Between May 1, 2017 and April 30, 2018 approximately 18,425,000 gallons of groundwater from wells CS-MW16-CC (~2,074,000 gallons), CS-MW16-LGR (~1,414,000 gallons), B3-EXW-01 (~1,686,000 gallons), B3-EXW-02 (~1,517,000 gallons), B3-EXW-03 (~3,062,000 gallons), B3-EXW-04 (~3,219,000 gallons), and B3-EXW-05 (~5,453,500 gallons) were injected into SWMU B-3 bioreactor trenches 1-6. A

total of 206,902,340 gallons of recovered groundwater from CS-MW16-CC, CS-MW16-LGR, B3-EXW-01, B3-EXW-02, B3-EXW-03, B3-EXW-04, and B3-EXW-05 have been injected into these trenches since normal bioreactor operations began. Samples of the injected groundwater were collected on June 20, September 20, and December 20, 2017, and March 21, 2018 for this reporting period. Results of analysis are summarized in the attached Table 1. Field forms which contain operational pressures and pH readings for the reporting period are also attached.

Planned activities for the next reporting period, May 1, 2018 through April 30, 2019, include the application of up to 2,120 gallons (eight 265-gallon totes) of sodium lactate within operational trenches and continued monitoring.

Additionally, please update TCEQ Authorization No. 5X2600431 records to include a new mailing address (below) for CSSA's environmental services contractor, Parsons, for future correspondence regarding this UIC Authorization.

Parsons
9101 Burnet Road, Suite 210
Austin, TX 78758

If you have any questions regarding the information contained in this letter, please feel free to contact me at (210) 295-7416 or Adrien Lindley, Parsons, at (512) 719-6052, adrien.lindley@parsons.com.

Sincerely,



Jason D. Shirley
Installation Manager

Enclosures

cc: Felicia Kraintz, CSSA Environmental Program Manager
Greg Lyssy, USEPA Region 6
Julie Burdey, Parsons (ltr only)
Ken Rice, Parsons
File: 640149.110046.03000

Table 1
Analytical Summary Data

Table 44.5.1

B3-UIC Analytical Results
March 2017 - March 2018

	Sample ID		Sample Date		Sample Type		Sampling Method		Lab ID		B3-UIC		B3-UIC		B3-UIC		B3-UIC		
	Lab	Lab	MDL	PQL	B3-UIC	Criteria	MDL	PQL	MDL	PQL	MDL	PQL	MDL	PQL	MDL	PQL	MDL	PQL	
SW8260B (µg/L)																			
cis-DCE	0.07	1.2	--	--	96	1	1	81	1	1	92	1	1	84	1	1	53	1	1
trans-DCE	0.08	0.6	--	--	0.53	F	1	0.49	F	1	2.1	1	1	2.2	1	1	1.9	1	1
TCE	0.05	1.0	500	500	101	1	1	82	1	1	87	1	1	83	1	1	57	1	1
PCE	0.06	1.4	700	700	79	1	1	64	1	1	67	1	1	58	1	1	45	1	1
Toluene	0.06	1.1	--	--	0.06	U	1	0.06	U	1	0.06	U	1	0.06	U	1	0.06	U	1
Vinyl chloride	0.08	1.1	200	200	0.08	U	1	0.08	U	1	0.08	U	1	0.08	U	1	0.08	U	1
EPA 160.1 (mg/L)																			
TDS	4.4	10	--	--	350	1	1	388	1	1	371	1	1	380	1	1	375	1	1

Tables present all laboratory results for analytes.

Data packages for laboratory results are presented in Attachment 1.

All samples were analyzed by APPL Laboratory Services.

pH results reported were field measured.

UIC criteria specified in 40 CFR 261.24 Table 1.

Data Qualifiers:

F - The analyte was positively identified, but the quantitation is an estimate.

U - The analyte was analyzed for, but not detected. The associated numeric

Abbreviations:

MDL Method Detection Limit

PQL Practical Quantitation Limit

N1 Environmental Sample

UIC Underground Injection Control

Field Forms

Personnel: **District 514**

Trench Sumps Water Levels (BTOC)

Sump ID	Sump Depth (ft BTOC)	Sump Water Level (ft BTOC)	pH	Temp (deg. C)	SpCond. (mS/cm)	ORP	DO (mg/L)	Trench Currency Being Used (%)	Notes
B3-T1-1	15.95	5.21	6.97	21.17	0.639	164.4	.10		1050
B3-T1-2	15.52	5.23	6.67	21.30	0.729	-20.0	.21	✓	0945 (DNA, H+)
B3-T1-3	14.97	5.21	6.86	19.18	0.770	-45.0	.08	✓	0900
B3-T2-1	11.78	5.21	6.51	21.22	0.856	123.3	.05	✓	0930 (DNA, H+)
B3-T2-2	11.12	5.21	6.56	21.01	0.828	-24.3	.03	✓	0900
B3-T3-1	11.05	5.47	6.95	21.58	0.628	227.2	2.27	✓	1040 (DNA, H+)
B3-T3-2	7.4	5.10	6.93	20.58	0.656	159.2	1.30	✓	1022
B3-T4-1	8.42	6.37	6.80	21.18	0.886	75.1	0.06	✓	-1325 (DNA, H+)
B3-T5-1	11.55	7.96	6.70	22.02	1.032	199.9	0.08	✓	1433 (DNA, H+)
B3-T5-2	11.04	8.22	6.47	21.57	0.887	-32.7	0.15	✓	1353
B3-T6-1	14.59	10.82	6.66	21.83	1.634	148.3	0.89	✓	1530
B3-T6-2	15.50	9.96	6.72	21.91	1.749	117.2	0.43	✓	1058 (DNA, H+)
B3-UIC			7.06	21.97	1.239	220.2	4.53		1410

3/9/17
3/9/17
3/13/17
3/14/17
3/13/17
3/13/17
3/13/17
3/14/17

B-3 Transfer System Monitoring

Meter	Date/Time	Monday	Tuesday	Wednesday	Thursday	Friday
Well ID		3/17/17	3/18/17	3/19/17	3/20/17	3/21/17
CS-MW16-CC	405	77222.10	77222.11	77222.11	77512.17	77657.24
CS-MW16-LGR	302	40385.31	40468.54	40468.54	40690.63	40906.53
B3-EXW01	338	59019.50	59289.18	59289.18	59993.62	60377.41
B3-EXW02	333	98573.80	98415.61	98415.61	99562.33	99852.54
B3-EXW03	313	24006.05	24206.56	24206.56	24628.22	24628.22
B3-EXW04	330	41316.74	41550.10	41550.10	41739.37	41739.30
B3-EXW05	364	0/5	0/5	0/5	0/5	0/5
T-1		Closed				
T-6		Closed				
Meter In:		75591.02	117276.73	117276.73	179164.65	179.55
Meter Out:		4000	4000	4000	4000	4000
Tank Levels:		40	10	8	6	10
Bag Filter Pressure (In/Out):		15	8	7	6	6
Change BF		150	75	75	75	75

Rate (gpm) / Cumulative Total (gal) / Well Head Pressure	Rate (gpm) / Cumulative Total (gal) / Well Head Pressure	Rate (gpm) / Cumulative Total (gal) / Well Head Pressure	Rate (gpm) / Cumulative Total (gal) / Well Head Pressure	Rate (gpm) / Cumulative Total (gal) / Well Head Pressure
12.08	12.08	12.08	12.08	12.08
17.65	17.65	17.65	17.65	17.65
26.19	26.19	26.19	26.19	26.19
23.94	23.94	23.94	23.94	23.94
0	0	0	0	0
0	0	0	0	0
0.15	0.15	0.15	0.15	0.15
79.67	79.67	79.67	79.67	79.67
4000	4000	4000	4000	4000
8	8	8	8	8
150	150	150	150	150
EXW's Bod Gauge	EXW's Bod Gauge	EXW's Bod Gauge	EXW's Bod Gauge	EXW's Bod Gauge

*T4-1 only H+ & DNA collected, other parameters to be collected later.

Personnel: Dietest 531

Trench Sumps Water Levels (BTOC)

Sump ID	Sump Depth (ft. BTOC)	Sump Water Level (ft. BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used (Y)	Notes
Date: 7/3/17 Time: 0830-0950									
B3-T1-1	15.95	5.57	6.80	23.50	0.726	-170.7	0.01		
B3-T1-2	15.52	5.50	6.84	23.60	0.976	-179.9	0.07	✓	
B3-T1-3	14.97	4.59	6.02	25.21	0.596	-151.5	0.16		
B3-T2-1	11.78	5.79	6.76	23.51	0.849	-190.9	0.04	✓	
B3-T2-2	11.12	5.48	6.80	24.41	0.828	-160.8	0.08		
B3-T3-1	11.05	5.58	6.97	23.10	0.625	-112.6	1.06	✓	
B3-T3-2	7.4	5.24	6.84	24.11	0.685	-156.7	0.18	✓	0.800 (Cond.)
B3-T4-1	8.42	6.64	6.79	24.80	0.733	-160.8	0.10	✓	
B3-T5-1	11.55	9.02	6.60	23.44	0.793	-108.8	0.09	✓	
B3-T5-2	11.04	8.20	6.60	23.80	0.915	-176.7	0.07	✓	
B3-T6-1	14.59	12.41	6.69	23.54	1.011	-146.4	0.07	✓	
B3-T6-2	15.50	13.25	6.71	23.94	0.754	-158.8	0.08	✓	
B3-UIC									

B-3 Transfer System Monitoring

Well ID	Date/Time	Flow Meter Readings				
		Monday	Tuesday	Wednesday	Thursday	Friday
Meter		7/3/17 1000	7/4/17	7/5/17 1100	7/6/17	7/7/17
CS-MW16-CC	405	877.257		10.52	878.2189	10.68
CS-MW16-LGR	302	6131260		0	6131260	0
B3-EXW01	338	7402005	446	0	7413361	6135111
B3-EXW02	333	1868413	0	0	1884015	1886403
B3-EXW03	313	26.934884232	0	0	4959938	4759938
B3-EXW04	330	14.50595045738	0	0	5960416	5960418
B3-EXW05	364	1386727	0	0	1386730	1386730
OR	T-1	Closed				
OR	T-6	Closed				
Meter Int:		57.12	98219162	10.33	9942802	10.55
Meter Out:		56.33	5524215	18.91	5648563	14.38
Tank Levels:		6600	6600	4100	4100	4300
Bag Filter Pressure (In/Out):		168	5	27	6	6
Change BF		(150)	(75)	150	75	150
			150	75	75	150
					75	75

Notes:

New Building

Personnel: Direct, Elliott 542

Trench Sumps Water Levels (BTOC)

Stump ID	Stump Depth (ft BTOC)	Stump Water Level (ft BTOC)	pH	Temp (deg C)	SpCond. (ms/cm)	ORP	DO (mg/L)	Trench Currently Being Used (Y)	Notes
Date: 9/18/17									
Time:									
B3-T1-1	15.95	9.166	6.168	25.02	0.821	-304.8	0.15	✓	9/27 1025
B3-T1-2	15.52	9.80	6.62	25.16	0.786	-192.5	0.18		9/26 1320 DNA 9/27 1450
B3-T1-3	14.97	8.88	6.58	28.78	0.878	-250.8	0.25		9/17 1138
B3-T2-1	11.78	9.74	6.168	24.24	0.654	-186.1	0.38	✓	9/26 1410 DNA, H+ 9/27 0930
B3-T2-2	11.12	8.56	6.168	21.82	0.920	-382.2	0.00		15/5 9/19
B3-T3-1	11.05	7.09	6.67	0.678	0.678	-96.3	0.37	✓	1430 9/19 DNA 9/20 1400
B3-T3-2	7.4	10.30	6.85	24.48	0.660	-177.2	0.39	✓	1415 9/19
B3-T4-1	8.42	7.32	6.73	25.26	0.713	-189.3	0.21	✓	1315 9/19 DNA 9/20
B3-T5-1	11.55	9.112	6.50	25.12	0.603	-218.4	3.15	✓	1445 H+, DNA 9/20
B3-T5-2	11.04	8.65	6.41	31.24	1.072	-287.6	0.24	✓	1420 9/18
B3-T6-1	14.59	12.40	6.68	21.81	0.782	-241.6	0.44	✓	0825 9/18
B3-T6-2	15.50	12.11	6.46	25.64	0.874	-273.3	0.14	✓	DNA, H+ 0845 9/18
B3-UIC			4.05	24.52	0.634	-39.6	5.39		0920 1210

B-3 Transfer System Monitoring

Well ID	Monday		Tuesday		Wednesday		Thursday		Friday	
	Date/Time	Flow Meter Reading	Date/Time	Flow Meter Reading	Date/Time	Flow Meter Reading	Date/Time	Flow Meter Reading	Date/Time	Flow Meter Reading
CS-MW16-CC	9/18/17 15:30	0	9/19/17 15:30	0	9/20/17 14:30	0	9/21/17 13:00	0	9/22/17 13:00	0
CS-MW16-LGR	9/18/17 15:30	9051450	9/19/17 15:30	6248406	9/20/17 14:30	6248406	9/21/17 13:00	6248406	9/22/17 13:00	6248406
B3-EXW01	9/18/17 15:30	78297330	9/19/17 15:30	78327940	9/20/17 14:30	78327940	9/21/17 13:00	78327940	9/22/17 13:00	78327940
B3-EXW02	9/18/17 15:30	2163239	9/19/17 15:30	2163239	9/20/17 14:30	2163239	9/21/17 13:00	2163239	9/22/17 13:00	2163239
B3-EXW03	9/18/17 15:30	5861525	9/19/17 15:30	5861525	9/20/17 14:30	5861525	9/21/17 13:00	5861525	9/22/17 13:00	5861525
B3-EXW04	9/18/17 15:30	1541771	9/19/17 15:30	1541771	9/20/17 14:30	1541771	9/21/17 13:00	1541771	9/22/17 13:00	1541771
B3-EXW05	9/18/17 15:30	23652920	9/19/17 15:30	238578718	9/20/17 14:30	2393809	9/21/17 13:00	2393809	9/22/17 13:00	2393809
T-1		Closed								
T-6										
Meter In:	24.11	3453602	23.94	3495912	31.38	3314998	31.38	3531998	31.53	3574164
Meter Out:	22.91	9130070	24.93	9163268	23.26	9203992	23.26	9246000	22.19	9286054
Tank Levels:	2800	2800	5500	5500	5000	5000	5000	5000	4800	4700
Bag Filler Pressure (In/Out):	0/6	6/5	0/7	5/5	0/7	5/5	0/7	5/5	0/7	5/5
Change BF:	150 μ	75 μ	150 μ	75 μ	150 μ	75 μ	150 μ	75 μ	150 μ	75 μ

Notes:

EXW03: Pump Fault Alarm
Pump Savor OK, Reset Alarm

EXW03 RTU Alarm: Unable to Reset.

DNA resume 10/3/17; B3-T2-1 0824
B3-T1-2 0819

557
LSS
FNA/B

Personnel: Dietert

Trench Sumps Water Levels (BTOC)

Stump ID	Stump Depth (ft BTOC)	Stump Water Level (ft BTOC)	pH	Temp. (deg. C)	SpCond. (mg/cm)	ORP	DO (mg/L)	Trench Currently Being Used (✓)	Notes
Date: 1/4/18 Time: 1330									
B3-T1-1	15.95	8.98	6.65	18.10	0.642	287.9	1.30	✓	
B3-T1-7	15.57	8.74	6.73	19.72	1.170	289.9	0.18		
B3-T1-3	14.97	8.76	6.69	22.29	0.861	-27.1	0.18		
B3-T2-1	11.78	9.37	6.65	18.42	0.642	287.9	1.30		
B3-T2-2	11.12	9.00	6.80	21.65	0.842	-32.7	0.11		
B3-T3-1	11.05	10.04	6.88	20.12	0.627	274.6	2.63		
B3-T3-2	7.4	7.25							Day
B3-T4-1	8.42								
B3-T5-1	11.55	10.36	6.55	24.50	1.104	161.8	0.20		
B3-T5-2	11.04	10.88	6.67	27.23	0.766	238.7	0.20		
B3-T6-1	14.59	11.58	6.53	20.10	0.839	-34.3	0.28	0.66	
B3-T6-2	15.50	11.38	6.58	21.82	1.058	-130.2	0.21	✓	
B3-UIC									

B-3 Transfer System Monitoring

Meter	Date/Time	Monday	Tuesday	Wednesday	Thursday	Friday
Well ID						
CS-MW16-CC	Pump Depth (ft)					
CS-MW16-LGR	405	9538.684	9538.681	9538.681	9538.681	9538.681
B3-EXW01	302	OIL	OIL	OIL	OIL	OIL
B3-EXW02	338	OIL	11.23	8.30	5.55	3.7
B3-EXW03	333	OIL	OIL	OIL	OIL	OIL
B3-EXW04	313	OIL	OIL	OIL	OIL	OIL
B3-EXW05	330	OIL	10.19	7.91	4.07	4.0
B3-EXW05	364	OIL	13.83	3.85	5.21	2.0
Meter						
T-1						
T-6						
Meter In:						
Meter Out:						
Tank Levels:						
Bag Filter Pressure (In/Out):						
Change BF:		150 μ	75 μ	150 μ	75 μ	150 μ
Notes:			Closed T2-T5 due to reduced influent flow recently		Transfer pump ran in the AM.	

T1-T1 WU 8.98 pH 6.85 Temp 19.56
 Cord 0.959 ORP 264.8 DO 0.88

Semi-Annual Bioreactor Sampling

Personnel: <i>D. Clark & Elliott</i>												
Sump ID	Sump Depth (ft. BTOC)	Sample Date	Sample Time	Water Level (ft. BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP	DO (mg/L)	Trench Currently Being Used	Notes	
B3-T1-1	15.95	3/19/18	1450	12.10	6.56	22.06	1.122	-92.6	2.50			
B3-T1-2	15.52	3/21/18	0945	11.47	6.65	22.06	1.129	-122.6	0.45	✓		
B3-T1-3	14.97	3/19/18	1430	10.75	6.46	23.35	0.828	-106.1	0.21			
B3-T2-1	11.78	3/19/18		11.11	6.42	20.62	1.031	39.9	0.41			
B3-T2-2	11.12	3/19/18		10.81	6.49	22.57	0.741	-104.2	1.16			
B3-T3-1	11.05			<i>Dry</i>								
B3-T3-2	7.4			<i>Dry</i>								
B3-T4-1	8.42			<i>Dry</i>								
B3-T5-1	11.55	3/19/18		11.18	6.40	21.84	0.976	73.3	1.51			
B3-T5-2	11.04	3/19/18		11.15								
B3-T6-1	14.63	3/19/18	1318	12.78	6.90	22.09	0.715	30.5	1.80			
B3-T6-2	15.56	3/21/18	0840	12.58	6.67	22.27	0.747	135.9	0.35	✓		
Well ID	Pump Depth (ft. BTOC)	Sample Date	Sample Time	Water Level (ft. BTOC)	pH	Temp. (deg. C)	SpCond. (mS/cm)	ORP (mV)	DO (mg/L)	Notes		
B3-MW01	287									(15-month)		
CS-D	253	3/5/15		250.30	10	54m/12						
CS-MW1-LGR	302	3/5/15	1345		7.03	21.84	0.590	186.8				
CS-MW5-LGR	407	3/21/18	1500		7.05	22.70	0.560	308.5				

Westbay Zone	Sampling Port (ft BTOC)	Sample Date	Sample Time	TOC Pressure (psi)	MP (psi)	Pressure in Zone
CS-WB05-LGR03B	262	3/15/18	0920	14.27-85	14.71-33.45	14.71
CS-WB06-LGR03B	260	3/15/18	1110	14.14	24.49	42.97
CS-WB07-LGR03B	257	3/19/18	0938	14.05	14.20	34.12
CS-WB08-LGR03B	273	3/19/18	0914	14.05	23.53	14.31

T6-2 3/2/18 ~~0840~~ 11.58 PH Temp Cond ORP DO
 0840 6.81 22.70 0.691 737.0 0.20

22.86 7.06 0.557 6.14 310.9
 22.81 7.05 0.556 6.05 310.6