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April 17, 2019

Daniel Hamel
Michigan Department of Environmental Quality
Environmental Response Division
Jackson District Office Building
301 E. Louis Glick Highway
Jackson, Michigan 49210

Re: **Quarterly Progress Report**
1st Quarter, 2019
January 1, 2019 to March 31, 2019

Dear Mr. Hamel:

Please find enclosed the Quarterly Progress Report for the period of January 1, 2019 to March 31, 2019.

Should you have any questions regarding this document, please contact me at 386-562-0176.

Sincerely,

A handwritten signature in black ink, appearing to read "L. Gelb", with a long horizontal line extending to the right.

Lawrence J. Gelb
Sr. Director Global EHS



1st Quarter, 2019

(January, February, March)

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Summary of Activity

CEB = Central Environmental Building
C3 = C3 aquifer
D2 = D2 aquifer
E = E aquifer
SW = Southwest Property Area
Maple = Maple Road

Treatment Activities

01/04/19, 01/22/19, & 01/27/19 - Treatment was shut down briefly for maintenance.

01/12/19 - TW-20 (C3) was shut down to adjust the Pond level and PW-1 (Marshy) was shut down due to low flow.

01/12/19 - 01/14/19 - TW-18 (E) and System 2A were shut down for communications maintenance.

01/13/19 - 01/14/19 - TW-21 & LB-4 (D2) and TW-19 & TW-23 (E) were shut down for communications maintenance.

01/14/19 - TW-28 (SW) extraction began and System 1A was shut down briefly for maintenance.

01/16/19 - SW extraction was shut down briefly for maintenance.

01/22/19 - LB-4 (D2) and TW-19 & TW-23 (E) were shut down briefly for maintenance.

01/24/19 - TW-21 (D2), TW-18 (E), and SW extraction were shut down briefly to adjust the Pond level and System 1A was shut down briefly for maintenance.

01/27/19 - LB-4 (D2), TW-19 & TW-23 (E) were shut down briefly to adjust the Pond level.

01/30/19 - System 2A was shut down briefly for maintenance.

02/01/19 – 02/28/19 - PW-1 (Marshy) was shut down intermittently due to flow fluctuations

02/02/19 - LB-4 (D2), TW-19 & TW-23 (E) were shut down briefly due to a power loss in the area.

02/06/19 - 02/07/19 - TW-21 (D2) was shut down for the piping upgrade at Porter St. pumping station.

02/06/19 - 02/08/19 - LB-4 (D2), TW-19 & TW-23 (E) were shut down for the piping upgrade at Porter St. pumping station.

02/07/19 - 02/08/19 - System 2A was shut down to control the Pond level.

02/11-19 & 02/12/19 & 02/13/19 - Treatment was shut down briefly for maintenance.

02/14/19 - LB-4 (D2) was shut down briefly due to a power loss in the area.

02/20/19 - TW-20 (C3) was shut down briefly for Red Pumphouse maintenance and System 2A was shut down briefly for maintenance.

02/21/19 - TW-21 & LB-4 (D2), Dolph & TW-21 (C3), TW-18, TW-19 & TW-23 (E), and treatment were shut down for Red Pumphouse maintenance.

02/25/19 - 02/26/19 - Treatment was shut down for communications maintenance.

02/26/19 - TW-21 & LB-4 (D2), Dolph & TW-21 (C3), TW-18, TW-19 & TW-23 (E) were shut down for communications maintenance.

03/01/19 – 03/31/19 - PW-1 (Marshy) was shut down intermittently due to flow fluctuations

03/06/19 - LB-4 (D2), TW-19 & TW-23 (E) were down due to a DTE Energy power outage in the area.

03/06/19 - 03/07/19 - System 1A was shut down to adjust the Pond level during DTE Energy power outage.

03/15/19 - System 1A was shut down for maintenance.

03/16/19 - System 2A was shut down briefly due to a DTE Energy power fluctuation.

03/17/19 - System 1A was shut down briefly due to a DTE Energy power fluctuation.

03/27/19 - LB-4 (D2), TW-19 & TW-23 (E) were down briefly due to a DTE Energy power outage in the area.

03/28/19 - Treatment was shut down for maintenance in the Green Pumphouse.

03/31/19 - SW extraction and System 1A were shut down due to a DTE Energy power outage.

Field Activities

Porter pumping station building was replaced.

TW-8 was replaced by TW-28.

Submittals/Responses

01/08/19 PLS submitted Discharge Monitoring Report (DMR) to DEQ
 PLS submitted Monthly Monitoring Report (NPDES) to DEQ

01/08/19 PLS submitted 4th Quarter 2018 Report to DEQ

02/13/19 PLS submitted Discharge Monitoring Report (DMR) to DEQ
 PLS submitted Monthly Monitoring Report (NPDES) to DEQ

03/11/19 PLS submitted Monthly Monitoring Report (NPDES) to DEQ
 PLS submitted Discharge Monitoring Report (DMR) to DEQ

Anticipated Major Activities for the Next Quarter

- Complete Amendment to Consent Judgment
- Work with MDEQ to update the Monitoring Plan

Quarterly Performance Analysis

For the months of January, February, March 2019, over 200 pounds of 1,4-dioxane were removed and 61,871,602 gallons of water were extracted from the contaminated aquifers, treated and discharged. The total mass of 1,4-dioxane removed since May 1997 is over 94,843 pounds and the total volume of water discharged since May 1997 is over 8.4 billion gallons.

In general, the performance of the operation was as expected, purging and treating contaminated groundwater to the existing allowable capacities.

QUARTERLY H₂O₂ INFLUENT	
	H₂O₂
	µg/l
2/4/19	
Well Name	
TW-20	<50
TW-18	<50
TW-23	<50
TW-2 (Dolph)	<50
LB-4	<50
TW-19	<50
TW-22	<50
TW-28	<50
TW-21	<50
PW-1 (sulfur content too high to measure H ₂ O ₂)	

Mass Reduction

MASS REDUCTION DETAIL BY AQUIFIER

January 1 - January 31, 2018

	Extraction Well	Month To Date Gallons Extracted	Month To Date Average Daily Flow Rate GPM	Month To Date Average Daily Pounds Removed	Month To Date Pounds Removed	Month To Date Average Concentration ppb
C3						
	TW-1	676	0	0.0	0.0	58
	TW-2 (Dolph)	583,584	13	0.0	0.7	136
	TW-3	1,278	0	0.0	0.0	8
	TW-10	6,126	0	0.0	0.0	363
	TW-20	1,329,519	30	0.4	12.2	1,100
	Sub-Totals	1,921,183	43	0	13	
Marshy						
	PW-1	69,000	2	0.019	0.6	998
	Sub-Totals	69,000	2	0.0	0.6	
E						
	TW-17	5,319	0	0.0	0.0	370
	TW-18	6,961,869	156	0.5	15.2	262
	TW-19	1,335,860	30	0.2	6.2	556
	TW-23	3,000,319	67	0.5	14.4	573
	Sub-Totals	11,303,367	253	1	36	
Southwest						
	Active Wells	806,240	18	0.1	4.4	593
	Sub-Totals	806,240	18	0.1	4	
D2						
	LB-4	4,356,819	98	0.6	18.0	496
	TW-21	2,798,659	63	0.2	5.6	238
	Sub-Totals	7,155,478	160	0.8	24	
Overall Totals		21,255,268	476	2.5	77.3	

*SW Active = TW-22, TW-28

MASS REDUCTION DETAIL BY AQUIFIER

February 1 - February 28, 2018

	Extraction Well	Month To Date Gallons Extracted	Month To Date Average Daily Flow Rate GPM	Month To Date Average Daily Pounds Removed	Month To Date Pounds Removed	Month To Date Average Concentration ppb
C3						
	TW-2 (Dolph)	489,000	12	0.0	0.5	131
	TW-20	1,176,956	29	0.3	9.1	930
	Sub-Totals	1,665,956	41	0.3	10	
Marshy						
	PW-1	46,994	1	0.0	0.4	938
	Sub-Totals	46,994	1	0.0	0.4	
E						
	TW-18	6,004,193	149	0.4	12.1	242
	TW-19	1,121,931	28	0.2	4.3	462
	TW-23	2,508,885	62	0.3	9.3	442
	Sub-Totals	9,635,009	239	0.9	26	
Southwest						
	Active Wells	1,124,839	28	0.2	5.2	559
	Sub-Totals	1,124,839	28	0.2	5	
D2						
	LB-4	3,639,833	90	0.5	13.6	446
	TW-21	2,221,876	55	0.1	4.1	222
	Sub-Totals	5,861,709	145	0.6	18	
Overall Totals		18,334,507	455	2.1	58.7	

*SW Active = TW-22, TW-28

MASS REDUCTION DETAIL BY AQUIFER

March 1 - March 31, 2018

	Extraction Well	Month To Date Gallons Extracted	Month To Date Average Daily Flow Rate GPM	Month To Date Average Daily Pounds Removed	Month To Date Pounds Removed	Month To Date Average Concentration ppb
C3						
	TW-2 (Dolph)	572151	13	0.0	1	124
	TW-20	1,338,192	30	0.3	9.5	854
	<i>Sub-Totals</i>	1,910,343	43	0.3	10	
Marshy						
	PW-1	48,892	1	0.0	0.3	817
	<i>Sub-Totals</i>	48,892	1	0.0	0.3	
E						
	TW-18	6,810,280	153	0.4	12.7	224
	TW-19	1,352,857	30	0.2	5.2	458
	TW-23	3,047,357	68	0.3	10.3	406
	<i>Sub-Totals</i>	11,210,494	251	0.9	28	
Southwest						
	TW-28	1,093,507	24	0.2	6	628
	TW-22	86,714	2	0.0	0.3	446
	<i>Sub-Totals</i>	1,180,221	26	0.2	6	
D0						
	Ann Arbor Cleaning	12,000			0.0093	93
	<i>Sub-Totals</i>	12,000			0.0093	
D2						
	LB-4	4,423,018	99	0.5	15.6	424
	TW-21	2,675,474	60	0.2	4.9	220
	<i>Sub-Totals</i>	7,098,492	159	0.7	21	
Overall Totals		21,460,442	480	2.1	65.0	

MASS REDUCTION SUMMARY
Mass Removed Per Month (lb)

A	B	C	D	E	F	G
Month	Mass Removed from Unit E Only	Mass Removed from Southwest Only	Mass Removed from Marshy Only	Mass Removed from Units C3 and D2 Only	Mass Removed from Unit D0	Total Mass Removed from Units E, D2, C3, D0, Southwest and Marshy
Aug-00	0	0	8	366		374
Sep-00	0	0	9	332		341
Oct-00	0	5	9	583		597
Nov-00	0	3	12	1160		1175
Dec-00	0	0	10	1040		1050
Jan-01	0	0	7	816		823
Feb-01	0	0	7	1056		1063
Mar-01	0	0	11	1379		1390
Apr-01	0	0	9	1140		1149
May-01	0	1	8	990		999
Jun-01	0	2	8	933		943
Jul-01	0	2	10	1121		1133
Aug-01	0	2	13	1018		1033
Sep-01	0	1	9	909		919
Oct-01	0	5	8	896		909
Nov-01	0	4	5	827		836
Dec-01	0	6	4	768		778
Jan-02	0	6	5	753		764
Feb-02	0	4	6	691		701
Mar-02	0	7	7	663		677
Apr-02	0	6	7	682		695
May-02	100	9	7	898		1014
Jun-02	94	9	6	889		998
Jul-02	56	10	7	640		713
Aug-02	53	8	6	745		812
Sep-02	51	8	6	860		925
Oct-02	33	6	4	603		646
Nov-02	57	8	5	880		950
Dec-02	48	9	5	842		904
Jan-03	45	8	6	839		898
Feb-03	37	6	6	767		816
Mar-03	44	8	7	763		822
Apr-03	39	8	3	716		766
May-03	36	13	5	725		779
Jun-03	34	15	5	683		737
Jul-03	29	15	5	678		727
Aug-03	31	15	6	676		728
Sep-03	27	16	5	644		692
Oct-03	34	17	5	701		757
Nov-03	26	12	5	663		706
Dec-03	29	14	6	635		684
Jan-04	28	15	6	667		716
Feb-04	8	11	5	485		509
Mar-04	23	14	7	573		617
Apr-04	27	15	6	537		585
May-04	16	10	5	439		470
Jun-04	21	11	5	499		536
Jul-04	36	12	5	506		559

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Aug-04	54	12	5	480		551
Sep-04	34	9	5	382		430
Oct-04	30	10	5	358		403
Nov-04	30	9	5	395		439
Dec-04	33	11	5	442		491
Jan-05	29	11	4	404		448
Feb-05	26	9	4	390		429
Mar-05	27	9	4	409		450
Apr-05	33	4	3	396		436
May-05	27	8	2	364		401
Jun-05	31	9	3	361		404
Jul-05	31	8	1	279		319
Aug-05	12	6	2	275		295
Sep-05	13	8	2	327		350
Oct-05	16	6	3	297		322
Nov-05	13	7	4	291		315
Dec-05	12	8	4	325		349
Jan-06	115	7	3	308		433
Feb-06	144	7	3	290		444
Mar-06	148	8	3	331		490
Apr-06	125	7	3	291		426
May-06	137	9	3	402		551
Jun-06	119	5	2	329		456
Jul-06	107	8	3	310		427
Aug-06	104	8	2	307		421
Sep-06	97	9	3	300		409
Oct-06	93	9	3	327		432
Nov-06	80	7	2	268		357
Dec-06	68	6	2	238		314
Jan-07	91	8	2	305		406
Feb-07	84	8	2	284		378
Mar-07	91	8	3	306		408
Apr-07	84	8	2	280		374
May-07	82	8	2	288		380
Jun-07	81	8	2	279		370
Jul-07	66	8	2	256		332
Aug-07	73	8	2	270		353
Sep-07	77	8	2	247		334
Oct-07	73	8	2	244		327
Nov-07	68	8	2	263		341
Dec-07	69	8	2	260		339
Jan-08	65	7	2	237		311
Feb-08	53	6	2	203		264
Mar-08	56	7	2	220		285
Apr-08	54	7	2	200		263
May-08	55	7	2	206		270
Jun-08	52	6	2	195		256
Jul-08	39	1	2	139		181

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Aug-08	50	7	2	198		256
Sep-08	43	5	2	177		227
Oct-08	45	5	2	187		239
Nov-08	45	7	2	197		251
Dec-08	45	5	2	187		239
Jan-09	39	8	2	124		173
Feb-09	34	8	2	122		164
Mar-09	35	8	2	122		166
Apr-09	32	6	1	119		158
May-09	45	7	2	201		254
Jun-09	39	5	1	157		202
Jul-09	38	5	1	152		196
Aug-09	39	7	2	202		250
Sep-09	36	6	2	223		267
Oct-09	36	8	2	206		251
Nov-09	32	7	1	167		208
Dec-09	32	8	1	171		212
Jan-10	34	8	1	175		219
Feb-10	30	7	1	161		198
Mar-10	33	7	1	173		214
Apr-10	33	7	1	175		216
May-10	33	7	1	176		217
Jun-10	29	6	1	130		165
Jul-10	20	7	1	171		200
Aug-10	23	7	1	188		220
Sep-10	21	6	1	148		177
Oct-10	24	7	2	185		218
Nov-10	18	6	2	151		176
Dec-10	26	6	2	164		198
Jan-11	25	6	2	163		195
Feb-11	25	7	2	165		198
Mar-11	27	8	2	174		209
Apr-11	22	6	1	143		171
May-11	20	5	1	138		164
Jun-11	17	5	1	104		127
Jul-11	15	4	1	92		112
Aug-11	14	2	1	80		97
Sep-11	16	6	1	98		121
Oct-11	17	6	1	113		137
Nov-11	33	6	1	105		145
Dec-11	45	6	1	98		150
Jan-12	46	6	1	103		156
Feb-12	40	5	1	89		135
Mar-12	43	5	1	94	0.017	142
Apr-12	47	6	1	105	0.000	159
May-12	47	6	1	100	0.000	154
Jun-12	42	6	0.3	99	0.029	148
Jul-12	30	6	0.1	102	0.000	138

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Aug-12	29	6	0.0	75	0.000	109
Sep-12	32	5	0.1	62	0.029	100
Oct-12	27	5	0.0	57	0.000	88
Nov-12	33	4	0.0	62	0.000	99
Dec-12	31	3	0.0	52	0.020	86
Jan-13	46	3	0.0	54	0.000	103
Feb-13	46	3	0.0	47	0.000	95
Mar-13	53	3	0.0	53	0.029	109
Apr-13	46	5	0.1	61	0.000	113
May-13	57	8	1.0	60	0.000	126
Jun-13	43	7	0.7	52	0.029	102
Jul-13	57	9	0.9	61	0.000	128
Aug-13	48	7	0.8	63	0.000	120
Sep-13	46	7	0.6	60	0.023	113
Oct-13	46	7	0.8	61	0.000	115
Nov-13	52	7	0.7	57	0.000	117
Dec-13	57	8	1.0	72	0.026	138
Jan-14	47	8	0.7	66	0.000	122
Feb-14	37	7	0.4	48	0.000	92
Mar-14	42	6	0.5	58	0.025	107
Apr-14	44	6	0.4	58	0.000	108
May-14	46	6	0.4	61	0.000	113
Jun-14	38	5	0.3	34	0.019	77
Jul-14	41	4	0.3	32	0.000	78
Aug-14	42	4	0.4	33	0.000	79
Sep-14	39	3	0.3	33	0.020	76
Oct-14	42	3	0.3	33	0.000	79
Nov-14	46	3	0.3	33	0.000	82
Dec-14	50	3	0.3	37	0.000	90
Jan-15	45	2	0.3	32	0.016	80
Feb-15	41	2	0.3	28	0.000	72
Mar-15	46	2	0.5	29	0.027	77
Apr-15	49	2	0.4	29	0.000	80
May-15	47	3	0.3	29	0.000	79
Jun-15	42	5	0.3	33	0.019	81
Jul-15	38	6	0.4	30	0.000	74
Aug-15	44	7	0.7	34	0.000	86
Sep-15	42	7	1.2	33	0.013	82
Oct-15	46	6	1.0	34	0.000	88
Nov-15	46	6	1.3	35	0.000	88
Dec-15	44	5	1.1	35	0.018	85
Jan-16	46	4	1.1	33	0.000	84
Feb-16	43	4	0.8	27	0.000	74
Mar-16	41	6	0.6	33	0.016	80
Apr-16	41	7	0.1	33	0.000	82
May-16	45	7	0.0	36	0.000	87
Jun-16	44	7	0.1	34	0.018	85
Jul-16	44	7	0.4	36	0.000	88

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Mass Removed Per Month (lb)

A	B	C	D	E	F	G
Month	Mass Removed from Unit E Only	Mass Removed from Southwest Only	Mass Removed from Marshy Only	Mass Removed from Units C3 and D2 Only	Mass Removed from Unit D0	Total Mass Removed from Units E, D2, C3, D0, Southwest and Marshy
Aug-16	42	7	0.1	34	0.000	83
Sep-16	38	5	0.9	32	0.021	77
Oct-16	40	5	0.9	31	0.000	77
Nov-16	41	6	0.1	33	0.000	79
Dec-16	43	6	0.2	33	0.017	82
Jan-17	44	6	0.8	36	0.000	87
Feb-17	36	5	0.6	29	0.000	71
Mar-17	39	5	0.6	33	0.017	78
Apr-17	34	5	0.3	31	0.000	70
May-17	32	5	0.5	27	0.000	64
Jun-17	31	4	0.3	26	0.018	61
Jul-17	32	5	0.1	36	0.000	73
Aug-17	29	6	0.0	37	0.000	71
Sep-17	31	5	0.0	27	0.033	63
Oct-17	36	4	0.2	28	0.000	67
Nov-17	34	5	0.7	28	0.000	68
Dec-17	32	5	0.8	28	0.020	65
Jan-18	36	6	0.9	32	0.000	75
Feb-18	28	4	0.5	26	0.000	59
Mar-18	37	4	0.6	34	0.019	75
Apr-18	33	4	0.7	31	0.000	68
May-18	36	4	0.5	35	0.000	75
Jun-18	33	4	0.4	32	0.016	70
Jul-18	33	4	0.3	32	0.000	69
Aug-18	31	4	0.4	33	0.000	68
Sep-18	33	3	0.5	34	0.020	71
Oct-18	39	3	0.6	34	0.000	77
Nov-18	32	3	0.6	33	0.000	69
Dec-18	37	0.8	0.6	35	0.021	73
Jan-19	36	4	0.6	37	0.000	77
Feb-19	26	5	0.4	27	0.000	59
Mar-19	28	6	0.3	31	0.009	65
Total to date	8929	1411	554	61470	0.60	72364

Maps