



Gelman Sciences, Inc. d/b/a  
Pall Life Sciences  
642 South Wagner Road  
Ann Arbor, MI 48103  
734.436.4025 phone  
734.436.4040 fax

January 8, 2020

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

Re: **Quarterly Progress Report**  
**4th Quarter, 2019**  
October 1, 2019 to December 31, 2019

Dear Mr. Hamel:

Please find enclosed the Quarterly Progress Report for the period of October 1, 2019 to December 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 stroke extending to the right.

Lawrence J. Gelb  
Sr. Director Global EHS



**4th Quarter, 2019**

**(October, November, December)**

## **Table of Contents**

Summary of activity during this quarter

Submittals/Responses

Anticipated activities for the next quarter

Quarterly Performance Analysis

Quarterly Influent Peroxide

Mass Reduction

## *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***

10/1/19 – 10/31/19 – PW-1 (Marshy) was shut down intermittently due to flow fluctuations.

10/1/19, 10/3/19 - 10/4/19 - TW-19 (E) was shut down due to DTE Energy power issues.

10/7/19 - Dolph (C3) was shut down for the removal of TW-12.

10/9/19 - Dolph (C3) was shut down briefly for maintenance.

10/23/19 - Extraction and Treatment were down during communication upgrades.

10/31/19 - TW-19 and TW-23 (E) were shut down briefly due to a DTE Energy power outage in the area.

11/1/19 – 11/20/19 - PW-1 (Marshy) was shut down intermittently due to flow fluctuations.

11/1/19 - TW-19 & TW-23 (E) were shut down briefly due to a DTE Energy power outage.

11/1/19 - Treatment was shut down briefly for maintenance.

11/2/19 - Dolph & TW-20 (C3) and TW-18 (E) were shut down for maintenance.

11/11/19 - LB-4 (D2) was shut down briefly due to a DTE Energy power outage in the area.

11/11/19 - 11/12/19 - TW-19 & TW-23 (E) were shut down briefly due to a DTE Energy power outage.

11/15/19 - 11/16/19 - TW-19 & TW-23 (E) were shut down briefly due to a DTE Energy power outage.

11/20/19 - LB-4 (D2), TW-19 & TW-23 (E) were shut down briefly for a communications upgrade.

11/21/19 - 11/23/19 - TW-19 & TW-23 (E) were shut down due to a DTE Energy power outage.

11/28/19 – 12/3/19 - TW-20 (C3) was shut down for maintenance.

12/1/19 - 12/11/19 - TW-17 (E) was turned on to make up flow lost by TW-18

## ***Field Activities***

10/8/19 - TW-12 was abandoned by a licensed well driller. This work was done at the request of the property owner.

## **Submittals/Responses**

10/7/19	PLS submitted Discharge Monitoring Report (DMR) to DEQ PLS submitted Monthly Monitoring Report (NPDES) to DEQ
10/17/19	PLS submitted 3rd Quarter 2019 Report to DEQ
11/7/19	PLS submitted Monthly Monitoring Report (NPDES) to DEQ PLS submitted Discharge Monitoring Report (DMR) to DEQ
12/9/19	PLS submitted Discharge Monitoring Report (DMR) to DEQ PLS submitted Monthly Monitoring Report (NPDES) to DEQ

## **Anticipated Major Activities for the Next Quarter**

- Continue to work toward an Amended Consent Judgment
- Continue to work with EGLE to update the Monitoring Plan/develop monitoring guidelines
- Continue to evaluate use of statistical methods (i.e. Mann-Kendall) to assess water quality trends
- Updates to well information database

## **Quarterly Performance Analysis**

For the months of October, November, December 2019, over 200 pounds of 1,4-dioxane were removed and 65,515,620 gallons of water were extracted from the contaminated aquifers, treated and discharged. The total mass of 1,4-dioxane removed since November 1997 is over 95,460 pounds and the total volume of water discharged since November 1997 is over 8.6 billion gallons.

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

<b>QUARTERLY H<sub>2</sub>O<sub>2</sub> INFLUENT</b>	
12/4/19	<b>H<sub>2</sub>O<sub>2</sub></b>
<b>Well Name</b>	<b>µg/l</b>
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 <sub>2</sub> O <sub>2</sub> )	

# Mass Reduction

**MASS REDUCTION DETAIL BY AQUIFIER**

**October 1 - October 31, 2019**

	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
<b>C3</b>						
	TW-1	2,150	0	0.000	0.0	38
	TW-2 (Dolph)	810,300	18	0.026	0.8	120
	TW-3	3,609	0	0.000	0.0	39
	TW-10	3,526	0	0.000	0.0	382
	TW-14	2,110	0.0	0.000	0.00	17
	TW-20	885,286	20	0.2	6.5	879
	<b>Sub-Totals</b>	<b>1,706,981</b>	<b>38</b>	<b>0.24</b>	<b>7</b>	
<b>Marshy</b>						
	PW-1	6,173	0	0.001	0.04	635
	<b>Sub-Totals</b>	<b>6,173</b>	<b>0</b>	<b>0.001</b>	<b>0.04</b>	
<b>E</b>						
	TW-17	3,942	0.1	0.0	0.01	324
	TW-18	7,138,422	160	0.5	14.9	250
	TW-19	1,317,724	30	0.2	6.5	589
	TW-23	3,044,956	68	0.4	11.2	441
	<b>Sub-Totals</b>	<b>11,505,044</b>	<b>258</b>	<b>1.1</b>	<b>33</b>	
<b>Southwest</b>						
	TW-28	1,107,899	25	0.2	5.9	636
	TW-22	85,291	2	0.01	0.33	460
	<b>Sub-Totals</b>	<b>1,193,190</b>	<b>27</b>	<b>0.2</b>	<b>6</b>	
<b>D2</b>						
	LB-4	4,427,312	99	0.5	17	461
	HW-S	979	0	0.0	0	882
	TW-9	3,821	0.1	0.0	0.0	529
	TW-21	2,570,968	58	0.1	4.5	209
	<b>Sub-Totals</b>	<b>7,003,080</b>	<b>157</b>	<b>0.7</b>	<b>22</b>	
<b>Overall Totals</b>		<b>21,414,468</b>	<b>480</b>	<b>2.2</b>	<b>67.7</b>	

**MASS REDUCTION DETAIL BY AQUIFIER**

**November 1 - November 30, 2019**

	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
<b>C3</b>						
	TW-2 (Dolph)	731,450	17	0.026	0.8	128
	TW-10	32,422	0.75	0.003	0.103	392
	TW-20	828,206	19	0.2	5.7	824
	<b>Sub-Totals</b>	<b>1,592,078</b>	<b>37</b>	<b>0.2</b>	<b>7</b>	
<b>Marshy</b>						
	PW-1	25,789	1	0.01	0.2	726
	<b>Sub-Totals</b>	<b>25,789</b>	<b>1</b>	<b>0.01</b>	<b>0.2</b>	
<b>E</b>						
	TW-18	6,823,229	158	0.5	14.2	250
	TW-19	1,271,040	29	0.2	5.4	510
	TW-23	2,846,203	66	0.4	13.1	552
	<b>Sub-Totals</b>	<b>10,940,472</b>	<b>253</b>	<b>1.1</b>	<b>33</b>	
<b>Southwest</b>						
	TW-28	1,065,698	25	0.2	6.1	686
	TW-22	52,891	1	0.01	0.2	476
	<b>Sub-Totals</b>	<b>1,118,589</b>	<b>26</b>	<b>0.2</b>	<b>6</b>	
<b>D2</b>						
	LB-4	4,296,870	99	0.531	15.9	444
	TW-9	33,528	1	0.0	0.1	514
	TW-21	2,558,519	59	0.2	4.8	226
	<b>Sub-Totals</b>	<b>6,888,917</b>	<b>159</b>	<b>0.7</b>	<b>21</b>	
<b>Overall Totals</b>		<b>20,565,845</b>	<b>476</b>	<b>2.2</b>	<b>66.7</b>	



**MASS REDUCTION DETAIL BY AQUIFER**

**December 1 - December 31, 2019**

	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
<b>C3</b>						
	TW-2 (Dolph)	594,674	13	0.02	0.6	130
	TW-20	679,230	15	0.16	4.9	873
	<i>Sub-Totals</i>	<u>1,273,904</u>	<u>29</u>	<u>0.2</u>	<u>5.6</u>	
<b>Marshy</b>						
	PW-1	69,074	2	0.0	0.5	822
	<i>Sub-Totals</i>	<u>69,074</u>	<u>2</u>	<u>0.0</u>	<u>0.5</u>	
<b>E</b>						
	IW-2	3,127	0	0.0	0.1	2100
	TW-17	1,655,021	37	0.1	2.8	242
	TW-18	5,912,219	132	0.4	11.9	241
	TW-19	1,378,003	31	0.2	6.3	544
	TW-23	3,127,386	70	0.4	11.8	454
	<i>Sub-Totals</i>	<u>12,075,756</u>	<u>270</u>	<u>1.1</u>	<u>33</u>	
<b>Southwest</b>						
	TW-28	910,508	20	0.2	5.4	709
	TW-22	23,825	0.5	0.0	0.1	444
	<i>Sub-Totals</i>	<u>934,333</u>	<u>21</u>	<u>0.2</u>	<u>5.5</u>	
<b>D0</b>						
	Ann Arbor Cleaning	28,000			0.018	78
	<i>Sub-Totals</i>	<u>28,000</u>			<u>0.018</u>	
<b>D2</b>						
	LB-4	4,469,717	100	0.6	17.8	476
	TW-5	18,665	0.4	0.0	0.1	710
	TW-21	2,683,228	60	0.2	5.8	257
	<i>Sub-Totals</i>	<u>7,171,610</u>	<u>161</u>	<u>0.8</u>	<u>24</u>	
<b>Overall Totals</b>		<u>21,524,677</u>	<u>482</u>	<u>2.2</u>	<u>68.0</u>	

**MASS REDUCTION SUMMARY**  
**Mass Removed Per Month (lb)**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
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

**MASS REDUCTION SUMMARY**  
**Mass Removed Per Month (lb)**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
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-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

**MASS REDUCTION SUMMARY**  
**Mass Removed Per Month (lb)**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
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-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

**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-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

**MASS REDUCTION SUMMARY**  
**Mass Removed Per Month (lb)**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
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
Apr-19	31	7	0.4	32	0.000	70
May-19	30	6	0.2	33	0.000	70
Jun-19	27	5	0.1	28	0.019	61
Jul-19	33	8	0.2	30	0.000	71
Aug-19	39	8	0.3	31	0.000	78
Sep-19	33	8	0.4	29	0.021	70
Oct-19	33	6	0.0	29	0.000	68
Nov-19	33	6	0.2	27	0.000	67
Dec-19	33	6	0.5	29	0.018	68
<b>Total to date</b>	<b>9220</b>	<b>1470</b>	<b>556</b>	<b>61739</b>	<b>0.66</b>	<b>72985</b>