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Robin Simmons

MAR 18 2019

Regional Land Manager

Oklahoma Water Resources Board

March 5, 2019

Matt Cogburn  
Oklahoma Water Resources Board  
3800 N. Classen  
Oklahoma City, OK 73118

Re: Martin Marietta/Material Producers Davis Quarry Q4 and Annual 2019 Monitoring Report

Dear Mr. Cogburn:

Attached please find the Q4 and Annual 2019 monitoring report and associated data and calculations for Martin Marietta/Material Producers' Davis Quarry.

As is typical at the Davis Quarry, in Q4 we see more precipitation and runoff entering the pit than the total water we use from the pit. Also typically, we do not see a rise in water levels in the pit that correspond to the additional precipitation and runoff that we know is entering the pit and not being used. Thus we still see a net decrease of water within the pit indicating that we continue to augment groundwater through the pit.

Sincerely,

A handwritten signature in blue ink that reads 'Robin L. Simmons'.

Robin L. Simmons  
Regional Land Manager

North Texas/Oklahoma District

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	Total Groundwater Entering Pit	Total Stormwater Entering Pit	Total Stormwater Diverted from Pit	Total Water Diverted	Water Sent To Holding Basin	Groundwater Augmentation	Streamwater Augmentation	Consumptive Use of Stormwater	Consumptive Use of Groundwater	Groundwater Pumped From Well
January-19	-7.82	9.24	9.24	1.42	N/A	-7.82	0.00	14.84	0.00	0.00
February-19	-10.70	10.42	10.42	-0.28	N/A	-10.70	0.00	2.96	0.00	0.00
March-19	-0.55	10.05	10.05	9.50	N/A	-0.55	0.00	4.06	0.00	0.00
1st QTR Totals	-19.07	29.71	29.71	10.64	0.00	-19.07	0.00	21.86	0.00	0.00
April-19	-30.82	39.24	39.24	8.42	N/A	-30.82	0.00	17.25	0.00	0.00
May-19	-28.34	60.22	60.22	31.88	N/A	-28.34	0.00	23.91	0.00	0.00
June-19	-11.72	18.97	18.97	7.25	N/A	-11.72	0.00	27.40	0.00	0.00
2nd QTR Totals	-70.88	118.43	118.43	47.54	0.00	-70.88	0.00	68.56	0.00	0.00
July-19	-11.50	2.56	2.56	-8.94	N/A	-11.50	0.00	5.32	0.00	0.00
August-19	-5.69	40.02	40.02	34.33	N/A	-5.69	0.00	7.09	0.00	0.00
September-19	-3.28	3.15	3.15	-0.13	N/A	-3.28	0.00	6.45	0.00	0.00
3rd QTR Totals	-20.47	45.74	45.74	25.26	0.00	-20.47	0.00	18.86	0.00	0.00
October-19	-8.94	25.54	25.54	16.59	N/A	-8.94	0.00	5.31	0.00	0.00
November-19	-4.83	11.49	11.49	6.66	N/A	-4.83	0.00	8.14	0.00	0.00
December-19	0.80	3.53	3.53	4.33	N/A	0.80	0.00	2.82	0.00	0.00
4th QTR Totals	-12.97	40.55	40.55	27.58	0.00	-12.97	0.00	16.27	0.00	0.00
2019 Totals	-123.40	234.43	234.43	111.02	0.00	-123.40	0.00	125.55	0.00	0.00

Note: Negative entries for Total Groundwater Entering Pit indicate that stormwater is entering the rock formation via the pit.



## Davis Water Balance

	Jan-19 31	Feb-19 28	Mar-19 31	Apr-19 30	May-19 31	Jun-19 30	Jul-19 31	Aug-19 31	Sep-19 30	Oct-19 31	Nov-19 30	Dec-19 31
<b>Monitoring Period, Days</b>												
<b>Monthly Production, tons</b>	126,209	133,315	140,391	151,319	164,948	137,854	130,071	154,611	144,113	154,480	118,224	110,761
<b>Product Moisture Content</b>	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
<b>Water Truck Loads</b>	22	39	29	104	106	99	85	126	142	69	22	25
<b>Month End Water Elevs.</b>												
1) Freshwater pond, depth to water	17.433	17.808	13.326	20.09	22.202	16.618	13.352	19.102	12.421	18.992	13.478	16.038
2) Pit Sump, depth to water	15	7.607	11.733	4.388	6.477	0	2.701	10.904	10.434	11.556	12.988	12.067
<b>Pond Surface Acres</b>												
1) Freshwater pond	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
2) Pit Sump	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Total surface acres	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
<b>Pond Water Volume Change</b>												
1) Freshwater pond	-3.160	0.413	-4.930	7.440	2.323	-6.142	-3.593	6.325	-7.349	7.228	-6.065	2.816
2) Pit Sump	-9.669	-4.209	9.490	-16.894	4.805	-14.897	-11.422	18.867	-1.081	2.581	3.294	-2.118
3) Change in settling pond storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>Net Volume Change</b>	<b>-12.830</b>	<b>-3.797</b>	<b>4.560</b>	<b>-9.453</b>	<b>7.128</b>	<b>-21.040</b>	<b>-15.014</b>	<b>25.192</b>	<b>-8.430</b>	<b>9.809</b>	<b>-2.772</b>	<b>0.698</b>
<b>Water Inputs, ac-ft</b>												
Rural Water	1.336	0.810	0.882	1.188	1.548	1.604	1.435	0.000	0.058	0.054	0.147	0.456
Lake Water	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Well Water	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Precipitation	9.244	10.420	10.045	39.239	60.220	18.969	2.565	40.021	3.153	25.536	11.488	3.527
<b>Total Water Input</b>	<b>10.580</b>	<b>11.230</b>	<b>10.927</b>	<b>40.427</b>	<b>61.768</b>	<b>20.573</b>	<b>4.000</b>	<b>40.021</b>	<b>3.211</b>	<b>25.590</b>	<b>11.635</b>	<b>3.982</b>
<b>Water Usage, ac-ft</b>												
Product moisture content	3.250	3.433	3.615	3.897	4.248	3.550	3.350	3.982	3.711	3.978	3.045	2.852
Haul road dust control	0.430	0.485	0.890	1.737	1.510	1.823	2.578	3.867	3.603	2.118	0.675	0.767
Evaporation losses	0.369	0.406	0.857	1.053	1.159	1.357	1.586	1.287	1.048	0.742	0.492	0.465
Misc usage	11.54	-	0.46	12.37	19.39	23.16	-	-	-	-	5.37	-
<b>Total Water Usage, Ac-ft</b>	<b>15.586</b>	<b>4.324</b>	<b>5.818</b>	<b>19.057</b>	<b>26.303</b>	<b>29.889</b>	<b>7.513</b>	<b>9.135</b>	<b>8.362</b>	<b>6.838</b>	<b>9.580</b>	<b>4.084</b>
<b>Net Water Input</b>	<b>-5.007</b>	<b>6.905</b>	<b>5.109</b>	<b>21.370</b>	<b>35.465</b>	<b>-9.317</b>	<b>-3.513</b>	<b>30.886</b>	<b>-5.151</b>	<b>18.752</b>	<b>2.055</b>	<b>-0.102</b>
<b>emergency storage of precipitation and runoff, ac-ft</b>												
<b>Groundwater Inflow</b>	<b>-7.823</b>	<b>-10.702</b>	<b>-0.549</b>	<b>-30.823</b>	<b>-28.337</b>	<b>-11.723</b>	<b>-11.501</b>	<b>-5.694</b>	<b>-3.279</b>	<b>-8.944</b>	<b>-4.827</b>	<b>0.800</b>
<b>Groundwater Inflow, Avg Ac-ft/Day</b>	<b>-0.252</b>	<b>-0.382</b>	<b>-0.018</b>	<b>-1.027</b>	<b>-0.914</b>	<b>-0.391</b>	<b>-0.371</b>	<b>-0.184</b>	<b>-0.109</b>	<b>-0.289</b>	<b>-0.161</b>	<b>0.026</b>
<b>Groundwater Inflow, Avg Gallons/Day</b>	<b>-82,229</b>	<b>-124,542</b>	<b>-5,772</b>	<b>-334,789</b>	<b>-297,860</b>	<b>-127,331</b>	<b>-120,895</b>	<b>-59,852</b>	<b>-35,616</b>	<b>-94,009</b>	<b>-52,426</b>	<b>8,406</b>



Consumptive Use

	January	February	March	April	May	June	July	August	September	October	November	December
Water Truck Usage	0.43	0.48	0.89	1.74	1.51	1.82	2.58	3.87	3.60	2.12	0.68	0.77
Moisture Content of Product Shipped	2.87	2.47	2.71	3.15	3.01	2.42	2.74	3.22	2.85	3.19	2.10	2.05
Misc on site use	-	-	-	-	-	-	-	-	-	-	-	-
Misc off site	11.54	-	0.46	12.37	19.39	23.16	-	-	-	-	5.37	-
Total	14.84	2.96	4.06	17.25	23.91	27.40	5.32	7.09	6.45	5.31	8.14	2.82

Shipped Tons	January	February	March	April	May	June	July	August	September	October	November	December
Base	52,546	41,837	37,631	33,546	56,302	24,628	30,311	28,950	28,925	29,192	31,866	31,675
Coarse Aggregate	55,131	63,716	85,063	78,511	60,494	66,915	78,539	81,506	79,745	80,134	47,709	50,976
Fine Aggregate	21,328	14,093	15,190	33,547	20,385	23,821	24,258	37,993	27,776	37,322	17,319	14,766
Total	129,005	119,646	137,885	145,604	137,180	115,364	133,107	148,449	136,446	146,647	96,894	97,417
Moisture Shipped	2.87	2.47	2.71	3.15	3.01	2.42	2.74	3.22	2.85	3.19	2.10	2.05



October Precipitation Data

**PIT RUNOFF ASSUMPTIONS**

Hydrologic Soil Group	D	
Land Use	gravel road	
AMC Condition	II (ave)	
CN (pit fringe)	88	area draining into pit
CN (pit)	100	area with direct interception
S (pit fringe)	1.364	area draining into pit
S (pit)	0.000	area with direct interception
Pit - Direct Interception (>95 ft deep)	64.12	subject to refinement
Pit fringe (area drains to pit)	161.49	subject to refinement
Drainage to Pit (total area)	225.61	subject to refinement

**Quarry areaFringe area**

Date	Precip, in.	Runoff, in.	Runoff, in.	Evapor, in/day
1-Oct	0.00	0.00	0.00	0.10
2-Oct	0.00	0.00	0.00	0.13
3-Oct	0.00	0.00	0.00	0.11
4-Oct	0.00	0.00	0.00	0.09
5-Oct	0.00	0.00	0.00	0.12
6-Oct	0.00	0.00	0.00	0.11
7-Oct	0.00	0.00	0.00	0.11
8-Oct	0.00	0.00	0.00	0.11
9-Oct	0.00	0.00	0.00	0.08
10-Oct	0.08	0.08	0.00	0.06
11-Oct	0.01	0.01	0.00	0.09
12-Oct	0.00	0.00	0.00	0.11
13-Oct	0.00	0.00	0.00	0.12
14-Oct	0.00	0.00	0.00	0.08
15-Oct	0.00	0.00	0.00	0.10
16-Oct	0.00	0.00	0.00	0.10
17-Oct	0.00	0.00	0.00	0.10
18-Oct	0.00	0.00	0.00	0.10
19-Oct	0.00	0.00	0.00	0.10
20-Oct	0.18	0.18	0.00	0.09
21-Oct	0.01	0.01	0.00	0.12
22-Oct	0.00	0.00	0.00	0.12
23-Oct	0.00	0.00	0.00	0.11
24-Oct	1.53	1.53	0.60	0.01
25-Oct	0.94	0.94	0.00	0.00
26-Oct	0.10	0.10	0.00	0.08
27-Oct	0.00	0.00	0.00	0.09
28-Oct	0.02	0.02	0.00	0.01
29-Oct	0.30	0.30	0.00	0.01
30-Oct	0.09	0.09	0.00	0.01
31-Oct	0.00	0.00	0.00	0.06
		3.26	0.60	
<b>Volume, ac-ft</b>		<b>17.42</b>	<b>8.12</b>	<b>2.619</b>
<b>Total Vol, ac-ft</b>		<b>25.54</b>		



## November Precipitation Data

**PIT RUNOFF ASSUMPTIONS**

Hydrologic Soil Group	D	
Land Use	gravel road	
AMC Condition	II (ave)	
CN (pit fringe)	88	area draining into pit
CN (pit)	100	area with direct interception
S (pit fringe)	1.364	area draining into pit
S (pit)	0.000	area with direct interception
Pit - Direct Interception (>95 ft deep)	64.12	subject to refinement
Pit fringe (area drains to pit)	161.49	subject to refinement
Drainage to Pit (total area)	225.61	subject to refinement

**Quarry areaFringe area**

Date	Precip, in.	Runoff, in.	Runoff, in.	Evapor, in/day
1-Nov	0.00	0.00	0.00	0.08
2-Nov	0.00	0.00	0.00	0.07
3-Nov	0.00	0.00	0.00	0.08
4-Nov	0.00	0.00	0.00	0.08
5-Nov	0.00	0.00	0.00	0.04
6-Nov	0.28	0.28	0.00	0.03
7-Nov	0.95	0.95	0.00	0.01
8-Nov	0.00	0.00	0.00	0.04
9-Nov	0.00	0.00	0.00	0.07
10-Nov	0.00	0.00	0.00	0.07
11-Nov	0.05	0.05	0.00	0.01
12-Nov	0.00	0.00	0.00	0.04
13-Nov	0.00	0.00	0.00	0.06
14-Nov	0.00	0.00	0.00	0.06
15-Nov	0.00	0.00	0.00	0.06
16-Nov	0.00	0.00	0.00	0.06
17-Nov	0.00	0.00	0.00	0.07
18-Nov	0.00	0.00	0.00	0.10
19-Nov	0.00	0.00	0.00	0.08
20-Nov	0.08	0.08	0.00	0.06
21-Nov	0.10	0.10	0.00	0.03
22-Nov	0.10	0.10	0.00	0.01
23-Nov	0.00	0.00	0.00	0.06
24-Nov	0.00	0.00	0.00	0.08
25-Nov	0.00	0.00	0.00	0.07
26-Nov	0.00	0.00	0.00	0.14
27-Nov	0.01	0.01	0.00	0.04
28-Nov	0.39	0.39	0.00	0.01
29-Nov	0.11	0.11	0.00	0.01
30-Nov	0.08	0.08	0.00	0.15
		0.00	0.00	
		2.15	0.00	
<b>Volume, ac-ft</b>		<b>11.49</b>	<b>0.00</b>	<b>1.735</b>
<b>Total Vol, ac-ft</b>		<b>11.49</b>		



## December Precipitation Data

**PIT RUNOFF ASSUMPTIONS**

Hydrologic Soil Group	D	
Land Use	gravel road	
AMC Condition	II (ave)	
CN (pit fringe)	88	area draining into pit
CN (pit)	100	area with direct interception
S (pit fringe)	1.364	area draining into pit
S (pit)	0.000	area with direct interception
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Pit fringe (area drains to pit)	161.49	subject to refinement
Drainage to Pit (total area)	225.61	subject to refinement

**Quarry areaFringe area**

Date	Precip, in.	Runoff, in.	Runoff, in.	Evapor, in/day
1-Dec	0.00	0.00	0.00	0.08
2-Dec	0.00	0.00	0.00	0.05
3-Dec	0.00	0.00	0.00	0.07
4-Dec	0.00	0.00	0.00	0.04
5-Dec	0.00	0.00	0.00	0.08
6-Dec	0.00	0.00	0.00	0.05
7-Dec	0.00	0.00	0.00	0.05
8-Dec	0.00	0.00	0.00	0.05
9-Dec	0.00	0.00	0.00	0.06
10-Dec	0.00	0.00	0.00	0.05
11-Dec	0.00	0.00	0.00	0.04
12-Dec	0.00	0.00	0.00	0.05
13-Dec	0.00	0.00	0.00	0.05
14-Dec	0.00	0.00	0.00	0.04
15-Dec	0.01	0.01	0.00	0.02
16-Dec	0.01	0.01	0.00	0.02
17-Dec	0.00	0.00	0.00	0.04
18-Dec	0.00	0.00	0.00	0.06
19-Dec	0.00	0.00	0.00	0.07
20-Dec	0.00	0.00	0.00	0.03
21-Dec	0.00	0.00	0.00	0.02
22-Dec	0.00	0.00	0.00	0.05
23-Dec	0.00	0.00	0.00	0.05
24-Dec	0.00	0.00	0.00	0.07
25-Dec	0.00	0.00	0.00	0.08
26-Dec	0.00	0.00	0.00	0.05
27-Dec	0.01	0.01	0.00	0.04
28-Dec	0.63	0.63	0.00	0.06
29-Dec	0.00	0.00	0.00	0.07
30-Dec	0.00	0.00	0.00	0.08
31-Dec	0.00	0.00	0.00	0.07
		0.66	0.00	
Volume, ac-ft		3.53	0.00	1.64
Total Vol, ac-ft		3.53		