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2018 4th Quarter Report

APR 30 2019

Oklahoma Water Resources Board

Report 2018

North Troy Quarry

Mill Creek, OK

Vulcan Materials Company

VMC North Troy 2018 Monitoring Report

All volumes are in acre-feet.

	All Water Pumped	Total Stormwater Entering Pit note(a)	Total Groundwater Diverted	Pit Water Sent To Holding Basin	Groundwater Augmentation	Streamwater Augmentation	Defined Elements of Consumptive Use of Pit Water	Streamwater Pumped From Mill Creek	Groundwater Pumped From Wells	Total Annual Groundwater Allocation, Ac-ft
January-18	348.44	2.07	346.37	68.31	281.64	0.00	8.60	0.00	0.00	219.50
February-18	211.66	81.44	130.22	13.38	202.77	0.00	7.29	0.00	0.00	219.50
March-18	567.35	28.02	539.33	8.20	561.54	0.00	7.76	0.00	0.23	219.50
1st QTR Totals	1127.45	111.53	1015.92	89.89	1045.95	0.00	23.64	0.00	0.23	N/A
April-18	494.37	19.22	475.14	19.76	479.84	0.00	8.76	0.00	0.00	219.50
May-18	583.18	68.24	514.94	57.94	527.63	0.00	12.12	0.00	0.00	219.50
June-18	503.73	21.81	481.92	16.48	492.49	0.00	12.26	0.00	0.00	219.50
2nd QTR Totals	1581.27	109.28	1472.00	94.18	1499.96	0.00	33.14	0.00	0.00	N/A
July-18	495.90	3.45	492.45	145.16	353.03	0.00	16.96	0.00	0.00	219.50
August-18	394.08	58.80	335.28	50.36	369.74	0.00	14.17	0.00	0.00	219.50
September-18	492.46	166.23	326.23	18.97	475.89	0.00	6.95	0.00	0.00	219.50
3rd QTR Totals	1382.44	228.48	1153.96	214.49	1198.66	0.00	38.08	0.00	0.00	N/A
October-18	653.61	86.81	566.80	22.74	635.36	0.00	8.00	0.00	0.00	219.50
November-18	587.57	1.38	586.19	26.94	563.23	0.00	6.15	0.00	0.00	219.50
December-18	531.81	77.04	454.77	28.66	507.89	0.00	4.86	0.00	0.00	219.50
4th QTR Totals	1772.99	165.23	1607.76	78.34	1706.48	0.00	19.02	0.00	0.00	N/A
2018 Totals	5864.16	614.51	5249.65	476.90	5451.03	0.00	113.89	0.00	0.23	219.50
2018 Total (adj)	5864.16	614.51	5249.65	476.90	5451.03	0.00	113.89	0.00	0.23	219.50

1st Qtr notes

2nd Qtr notes Main production well/ electrical issue & tranducer error
Holding pond transducer error

3rd Qtr notes

4th Qtr notes Transducer error fresh pond

(a) Total Stormwater = Volume of precipitation that falls into prodicing mine pit and volume of precipitation that falls onto producing mine and flows over the land surface into the mine pit.

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2018 ANNUAL REPORT

Oklahoma Water Resources Board

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North Troy Quarry

Mill Creek, OK

Vulcan Materials Company

VMC North Troy 2018 Monitoring Report

All volumes are in acre-feet.

	All Water Pumped	Total Stormwater Entering Pit note(a)	Total Groundwater Diverted	Pit Water Sent To Holding Basin	Groundwater Augmentation	Streamwater Augmentation	Defined Elements of Consumptive Use of Pit Water	Streamwater Pumped From Mill Creek	Groundwater Pumped From Wells	Total Annual Groundwater Allocation, Ac-ft
January-18	348.44	2.07	346.37	68.31	281.64	0.00	8.60	0.00	0.00	219.50
February-18	211.66	81.44	130.22	13.38	202.77	0.00	7.29	0.00	0.00	219.50
March-18	567.35	28.02	539.33	8.20	561.54	0.00	7.76	0.00	0.23	219.50
1st QTR Totals	1127.45	111.53	1015.92	89.89	1045.95	0.00	23.64	0.00	0.23	N/A
April-18	494.37	19.22	475.14	19.76	479.84	0.00	8.76	0.00	0.00	219.50
May-18	583.18	68.24	514.94	57.94	527.63	0.00	12.12	0.00	0.00	219.50
June-18	503.73	21.81	481.92	16.48	492.49	0.00	12.26	0.00	0.00	219.50
2nd QTR Totals	1581.27	109.28	1472.00	94.18	1499.96	0.00	33.14	0.00	0.00	N/A
July-18	495.90	3.45	492.45	145.16	353.03	0.00	16.96	0.00	0.00	219.50
August-18	394.08	58.80	335.28	50.36	369.74	0.00	14.17	0.00	0.00	219.50
September-18	492.46	166.23	326.23	18.97	475.89	0.00	6.95	0.00	0.00	219.50
3rd QTR Totals	1382.44	228.48	1153.96	214.49	1198.66	0.00	38.08	0.00	0.00	N/A
October-18	653.61	86.81	566.80	22.74	635.36	0.00	8.00	0.00	0.00	219.50
November-18	587.57	1.38	586.19	26.94	563.23	0.00	6.15	0.00	0.00	219.50
December-18	531.81	77.04	454.77	28.66	507.89	0.00	4.86	0.00	0.00	219.50
4th QTR Totals	1772.99	165.23	1607.76	78.34	1706.48	0.00	19.02	0.00	0.00	N/A
2018 Totals	5864.16	614.51	5249.65	476.90	5451.03	0.00	113.89	0.00	0.23	219.50
2018 Total (adj)									0.23	219.50

1st Qtr notes

2nd Qtr notes
Main production well transducer error
Holding pond transducer error

3rd Qtr notes

4th Qtr notes

(a) Total Stormwater = Volume of precipitation that falls into producing mine pit and volume of precipitation that falls onto producing mine and flows over the land surface into the mine pit.
(adj) Annual total adjustment for stormwater carried over to next calendar year

Water Balance =	-678.29	Total Net Reported Consumptive Use
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Revisions:

06-2018

Stormwater watershed area revised based on actual pit area

(adj) adjustment based on stored water

streamwater augmentation totals revised to show actual augmentation credits

added notes for definitions

MILL CREEK 2018 AUGMENTATION and GAUGE DATA

Start Date	Start Time	Stop Date	Stop Time	Begin Reading	End Reading	Augmentation Ac - Ft pumped	Stormwater Pumped AF	Mill Creek Stream gauge Reading		Time Read	Stream height	Stream flow
January 2018	No water Pumped to Mill creek					0.00						
February 2018	No water Pumped to Mill creek					0.00						
March 2018	No water Pumped to Mill creek					0.00						
April 2018	No water Pumped to Mill creek					0.00						
May 2018	No water Pumped to Mill creek					0.00						
June 2018	No water Pumped to Mill creek					0.00						
July 2018	No water Pumped to Mill creek					0.00						
August 2018	No water Pumped to Mill creek					0.00						
September 2018	No water Pumped to Mill creek					0.00						
October 2018	No water Pumped to Mill creek					0.00						
November 2018	No water Pumped to Mill creek					0.00						
December 2018	No water Pumped to Mill creek					0.00						
Total						0.00						

0.00 Pumped to Mill Creek
0.00 Augmented to Mill Creek
Stormwater collected entering pit
0 Stormwater pumped to Mill Creek

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October Precipitation/Evaporation 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)	1,363.36	area draining into pit		
S (pit)	0	area with direct interception		
Pit - Direct Interception (>95 ft deep)	103.45	subject to refinement	**	
Pit fringe (area drains to pit)	84.94	subject to refinement	**	
Drainage to Pit (total area)	188.39	subject to refinement		

Date	Precip, in.	Runoff, in.	Runoff, in.	Dailyaporation, in.
1-Oct	0.00	0.00	0.00	0.17
2-Oct	0.00	0.00	0.00	0.13
3-Oct	0.00	0.00	0.00	0.23
4-Oct	0.00	0.00	0.00	0.22
5-Oct	0.00	0.00	0.00	0.22
6-Oct	0.83	0.83	0.00	0.16
7-Oct	2.33	2.33	1.24	0.1
8-Oct	0.00	0.00	0.00	0.16
9-Oct	1.43	1.43	0.53	0.05
10-Oct	0.00	0.00	0.00	0.13
11-Oct	0.00	0.00	0.00	0.13
12-Oct	0.76	0.76	0.00	0.04
13-Oct	1.73	1.73	0.75	0.03
14-Oct	0.20	0.20	0.00	0.04
15-Oct	0.04	0.04	0.00	0.1
16-Oct	0.08	0.08	0.00	0.1
17-Oct	0.04	0.04	0.00	0.08
18-Oct	0.00	0.00	0.00	0.07
19-Oct	0.56	0.56	0.00	0.03
20-Oct	0.00	0.00	0.00	0.1
21-Oct	0.00	0.00	0.00	0.1
22-Oct	0.00	0.00	0.00	0.1
23-Oct	0.00	0.00	0.00	0.1
24-Oct	0.00	0.00	0.00	0.04
25-Oct		0.00	0.00	0.05
26-Oct		0.00	0.00	0.1
27-Oct		0.00	0.00	0.11
28-Oct		0.00	0.00	0.12
29-Oct		0.00	0.00	0.19
30-Oct		0.00	0.00	0.14
31-Oct		0.00	0.00	0.05
sum	8.00	8.00	2.52	3.38
Volume, ac-ft		68.97	17.85	
Total Vol, ac-ft		86.81		

Pan Evaporation from Sulphur Mesonet

* Used Mesonet Pan Evaporation - Sulphur

November Precipitation/Evaporation 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)	1,363.36	area draining into pit		
S (pit)	0	area with direct interception		
Pit - Direct Interception (>95 ft deep)	103.45	subject to refinement	**	
Pit fringe (area drains to pit)	84.94	subject to refinement	**	
Drainage to Pit (total area)	188.39	subject to refinement		

Date	Precip, in.	Runoff, in.	Runoff, in.	Dailyaporation, in.
1-Nov		0.00	0.00	0.1
2-Nov		0.00	0.00	0.1
3-Nov		0.00	0.00	0.15
4-Nov		0.00	0.00	0.09
5-Nov		0.00	0.00	0.13
6-Nov		0.00	0.00	0.15
7-Nov		0.00	0.00	0.13
8-Nov		0.00	0.00	0.06
9-Nov		0.00	0.00	0.09
10-Nov		0.00	0.00	0.1
11-Nov		0.00	0.00	0.09
12-Nov		0.00	0.00	0.06
13-Nov		0.00	0.00	0.06
14-Nov		0.00	0.00	0.05
15-Nov		0.00	0.00	0.11
16-Nov		0.00	0.00	0.1
17-Nov		0.00	0.00	0.14
18-Nov		0.00	0.00	0.04
19-Nov	0.00	0.00	0.00	0.05
20-Nov	0.00	0.00	0.00	0.06
21-Nov	0.00	0.00	0.00	0.08
22-Nov	0.00	0.00	0.00	0.11
23-Nov	0.00	0.00	0.00	0.14
24-Nov	0.00	0.00	0.00	0.2
25-Nov	0.00	0.00	0.00	0.17
26-Nov	0.00	0.00	0.00	0.06
27-Nov	0.00	0.00	0.00	0.08
28-Nov	0.00	0.00	0.00	0.13
29-Nov	0.00	0.00	0.00	0.16
30-Nov	0.16	0.16	0.00	0.1
sum		0.16	0.16	3.09
Volume, ac-ft		1.38	0.08	
Total Vol, ac-ft		1.38		

Pan Evaporation from Sulphur Mesonet

* Used Mesonet Pan Evaporation - Sulphur

December Precipitation/Evaporation 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)	1,363.36	area draining into pit		
S (pit)	0	area with direct interception		
Pit - Direct Interception (>95 ft deep)	103.45	subject to refinement		
Pit fringe (area drains to pit)	84.94	subject to refinement		
Drainage to Pit (total area)	188.39	subject to refinement		

Date	Precip, in.	Runoff, in.	Runoff, in.	Dailyaporation, in.
1-Dec	0.00	0.00	0.00	0.2
2-Dec	0.00	0.00	0.00	0.07
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	0.06
6-Dec	0.02	0.02	0.00	0.08
7-Dec	0.14	0.14	0.00	0.04
8-Dec	0.77	0.77	0.00	0.01
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	0.1
12-Dec	0.00	0.00	0.00	0.08
13-Dec	3.33	3.33	2.11	0.04
14-Dec	0.66	0.66	0.00	0.05
15-Dec	0.00	0.00	0.00	0.08
16-Dec	0.00	0.00	0.00	0.06
17-Dec	0.00	0.00	0.00	0.05
18-Dec	0.00	0.00	0.00	0.06
19-Dec	0.02	0.02	0.00	0.03
20-Dec	0.00	0.00	0.00	0.17
21-Dec	0.00	0.00	0.00	0.08
22-Dec	0.00	0.00	0.00	0.09
23-Dec	0.00	0.00	0.00	0.07
24-Dec	0.00	0.00	0.00	0.08
25-Dec	0.07	0.07	0.00	0.02
26-Dec	1.25	1.25	0.00	0.02
27-Dec	0.06	0.06	0.00	0.07
28-Dec	0.00	0.00	0.00	0.06
29-Dec	0.00	0.00	0.00	0.04
30-Dec	0.38	0.38	0.00	0.02
31-Dec	0.50	0.50	0.00	0.07
sum	7.20	7.20	2.11	2.02
Volume, ac-ft		62.07	14.57	
Total Vol, ac-ft		77.04		

Pan Evaporation from Sulphur Mesonet

* Used Mesonet Pan Evaporation - Sulphur

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Monthly Water Data, ac-ft

	Water Diverted From Pit	Storm Water Entering Pit	Net Sump Volume Change	Groundwater Sent To Holding Basin	Groundwater Sent To Infiltration Areas	Groundwater Used For Stream Augmentation	Evaporation	Moisture Content of Product Shipped	Water Truck Usage	Misc Pit Water Use On Site	Misc Pit Water Use Off Site	Production Well Permit 2002-602	North Well Permit 20060601A
January-18	348.44	2.07	-8.73	68.31	280.12	0.00	0.48	2.98	5.14	0.00	0.00	0.00	0.00
February-18	211.66	81.44	6.54	13.38	198.28	0.00	0.39	2.37	4.53	0.00	0.00	0.00	0.00
March-18	567.35	28.02	-3.55	8.20	559.15	0.00	0.86	2.37	4.53	0.00	0.00	0.23	0.00
April-18	494.37	19.22	3.81	19.76	474.60	0.00	1.61	3.46	3.70	0.00	0.00	0.00	0.00
May-18	583.18	68.24	-3.56	57.94	525.24	0.00	1.86	4.67	5.60	0.00	0.00	0.00	0.00
June-18	503.73	21.81	3.00	16.48	487.25	0.00	2.01	4.61	5.63	0.00	0.00	0.00	0.00
July-18	495.90	3.45	-8.93	145.16	350.75	0.00	2.08	3.91	10.97	0.00	0.00	0.00	0.00
August-18	394.08	58.80	3.71	50.36	364.00	0.00	1.83	4.06	8.29	0.00	0.00	0.00	0.00
September-18	492.46	166.23	2.80	18.97	473.50	0.00	0.95	4.39	1.60	0.00	0.00	0.00	0.00
October-18	653.61	86.81	0.93	22.74	630.87	0.00	0.76	4.04	3.20	0.00	0.00	0.00	0.00
November-18	587.57	1.38	-0.47	26.94	560.62	0.00	0.69	2.48	2.98	0.00	0.00	0.00	0.00
December-18	531.81	77.04	-0.47	28.66	503.15	0.00	0.45	3.19	1.22	0.00	0.00	0.00	0.00

Pit Sump Volumes

	West Sump						905 Sump					New Freshwater Pond						Pit area		
	Month End Depth-to- Water, Ft	Width, Ft	Length, Ft	Sump Volume Change, Ac-ft	Evaporation, ac- ft	Month End Depth-to-Water, Ft	Width, Ft	Length, Ft	Sump Volume Change, Ac-ft	Evaporation, ac-ft	Month End Depth-to- Water, Ft	Width, Ft	Length, Ft	Pond Volume Change, Ac-ft	Evaporation, ac-ft	Total Evaporation, ac-ft	Acres	Evaporation, ac-ft		
January-18	13.09	125	325	-8.73	0.23	4	50	50	0.00	0.02	5.503		750	0.00	0.00	0.28	1.7	0.48		
February-18	6.08	125	325	6.54	0.23	4	50	50	0.00	0.01	5.65		750	0.00	0.00	0.23	1.7	0.39		
March-18	9.89	125	325	-3.55	0.47	4	50	50	0.00	0.03	5.31		750	0.00	0.00	0.50	1.7	0.86		
April-18	5.8	125	325	3.81	0.56	4	50	50	0.00	0.03	5.0		750	0.00	0.00	0.59	1.7	1.02		
May-18	9.62	125	325	-3.56	0.64	4	50	50	0.00	0.04	5.0		750	0.00	0.00	0.68	1.7	1.17		
June-18	6.4	125	325	3.00	0.70	4	50	50	0.00	0.04	5.0		750	0.00	0.00	0.74	1.7	1.27		
July-18	15.98	125	325	-8.93	0.72	4	50	50	0.00	0.04	5.0		750	0.00	0.00	0.77	1.7	1.32		
August-18	12.0	125	325	3.71	0.63	4	50	50	0.00	0.04	5.0		750	0.00	0.00	0.67	1.7	1.15		
September-18	9.0	125	325	2.80	0.33	4	50	50	0.00	0.02	5.0		750	0.00	0.00	0.35	1.7	0.60		
October-18	8	125	325	0.93	0.26	4	50	50	0.00	0.02	5.0		750	0.00	0.00	0.28	1.7	0.48		
November-18	8.5	125	325	-0.47	0.24	4	50	50	0.00	0.01	5.0		750	0.00	0.00	0.25	1.7	0.44		
December-18	9	125	325	-0.47	0.16	4	50	50	0.00	0.01	5.0		750	0.00	0.00	0.17	1.7	0.29		

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October Shipments			November Shipments			December Shipments		
	Tons Shipped	Ac-ft of water shipped		Tons Shipped	Ac-ft of water shipped		Tons Shipped	Ac-ft of water shipped
Base Products	572	0.014	Base Products	1,181	0.029	Base Products	485	0.012
Coarse Aggregates	208,837	2.510	Coarse Aggregates	163,233	1.962	Coarse Aggregates	246,108	2.958
Fine Aggregates	47,744	1.517	Fine Aggregates	15,345	0.488	Fine Aggregates	7,053	0.224
	257,153	4.041		179,759	2.478		253,646	3.194

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