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# 2018 3rd Quarter Report

Report 2018

North Troy Quarry

Mill Creek, OK

Vulcan Materials Company

Oklahoma Water Resources Board

## 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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	219.50
November-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	219.50
December-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	219.50
4th QTR Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
2018 Totals	4091.17	449.28	3641.88	398.56	3744.56	0.00	94.87	0.00	0.23	219.50
2018 Total (adj)	4091.17	449.28	3641.88	398.56	3744.56	0.00	94.87	0.00	0.23	219.50

1st Qtr notes

2nd Qtr notes

Main production well/ electrical issue & 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.

# 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						
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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## July 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)	1.363636	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.	Daily	Evaporation, in.
1-Jul	0.00	0.00	0.00	0.17	Runoff formula
2-Jul	0.00	0.00	0.00	0.29	Pe = (P-0.2S)*2/(P+0.8S)
3-Jul	0.00	0.00	0.00	0.39	S = (1000/CN)-10
4-Jul	0.00	0.00	0.00	0.29	
5-Jul	0.00	0.00	0.00	0.26	Blue cells contain formulas
6-Jul	0.00	0.00	0.00	0.29	
7-Jul	0.00	0.00	0.00	0.25	
8-Jul	0.00	0.00	0.00	0.29	
9-Jul	0.00	0.00	0.00	0.21	
10-Jul	0.00	0.00	0.00	0.24	
11-Jul	0.00	0.00	0.00	0.29	
12-Jul	0.00	0.00	0.00	0.26	
13-Jul	0.00	0.00	0.00	0.26	
14-Jul	0.00	0.00	0.00	0.33	
15-Jul	0.00	0.00	0.00	0.32	
16-Jul	0.00	0.00	0.00	0.3	
17-Jul	0.00	0.00	0.00	0.36	
18-Jul	0.00	0.00	0.00	0.22	
19-Jul	0.00	0.00	0.00	0.36	
20-Jul	0.00	0.00	0.00	0.51	
21-Jul	0.00	0.00	0.00	0.45	
22-Jul	0.00	0.00	0.00	0.37	
23-Jul	0.00	0.00	0.00	0.31	
24-Jul	0.00	0.00	0.00	0.32	
25-Jul	0.00	0.00	0.00	0.3	
26-Jul	0.00	0.00	0.00	0.29	
27-Jul	0.00	0.00	0.00	0.32	
28-Jul	0.00	0.00	0.00	0.24	
29-Jul	0.00	0.00	0.00	0.28	
30-Jul	0.40	0.40	0.00	0.27	
31-Jul	0.00	0.00	0.00	0.26	
sum	0.40	0.40	0.00	9.30	
Volume, ac-ft		3.45	0.00		
Total Vol, ac-ft		3.45			Pan Evaporation from Sulphur Mesonet

9.3

## August 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)	1.363636	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.	Daily	Evaporation, in.
1-Aug	0.00	0.00	0.00	0.26	Runoff formula
2-Aug	0.00	0.00	0.00	0.29	Pe = (P-0.2S)*2/(P+0.8S)
3-Aug	0.00	0.00	0.00	0.39	S = (1000/CN)-10
4-Aug	0.00	0.00	0.00	0.38	
5-Aug	0.00	0.00	0.00	0.36	Blue cells contain formulas
6-Aug	0.00	0.00	0.00	0.35	
7-Aug	0.20	0.20	0.00	0.33	
8-Aug	0.20	0.20	0.00	0.1	
9-Aug	0.00	0.00	0.00	0.19	
10-Aug	0.00	0.00	0.00	0.24	
11-Aug	0.00	0.00	0.00	0.2	
12-Aug	0.71	0.71	0.00	0.13	
13-Aug	3.47	3.47	2.24	0.05	
14-Aug	0.16	0.16	0.00	0.22	
15-Aug	0.24	0.24	0.00	0.23	
16-Aug	0.00	0.00	0.00	0.25	
17-Aug	0.00	0.00	0.00	0.27	
18-Aug	0.00	0.00	0.00	0.2	
19-Aug	0.00	0.00	0.00	0.18	
20-Aug	0.00	0.00	0.00	0.22	
21-Aug	0.00	0.00	0.00	0.2	
22-Aug	0.00	0.00	0.00	0.2	
23-Aug	0.00	0.00	0.00	0.27	
24-Aug	0.00	0.00	0.00	0.36	
25-Aug	0.00	0.00	0.00	0.35	
26-Aug	0.00	0.00	0.00	0.33	
27-Aug	0.00	0.00	0.00	0.37	
28-Aug	0.00	0.00	0.00	0.36	
29-Aug	0.00	0.00	0.00	0.29	
30-Aug	0.00	0.00	0.00	0.29	
31-Aug	0.00	0.00	0.00	0.29	
sum	4.98	4.98	2.24	8.15	
Volume, ac-ft		42.93	15.86		
Total Vol, ac-ft		58.80			Pan Evaporation from Sulphur Mesonet

8.15

## September 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)	1.363636	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.	Daily	Evaporation, in.
1-Sep	0.00	0.00	0.00	0.29	Runoff formula
2-Sep	0.00	0.00	0.00	0.28	Pe = (P-0.2S)*2/(P+0.8S)
3-Sep	0.00	0.00	0.00	0.15	S = (1000/CN)-10
4-Sep	0.20	0.20	0.00	0.19	
5-Sep	0.59	0.59	0.00	0.11	Blue cells contain formulas
6-Sep	0.94	0.94	0.00	0.13	
7-Sep	1.38	1.38	0.50	0.08	
8-Sep	0.00	0.00	0.00	0.07	
9-Sep	0.00	0.00	0.00	0.08	Evap data from Sulphur Mesonet
10-Sep	0.00	0.00	0.00	0.11	
11-Sep	0.00	0.00	0.00	0.13	
12-Sep	0.00	0.00	0.00	0.13	
13-Sep	0.00	0.00	0.00	0.15	
14-Sep	0.00	0.00	0.00	0.21	
15-Sep	0.04	0.04	0.00	0.13	
16-Sep	0.00	0.00	0.00	0.17	
17-Sep	0.00	0.00	0.00	0.17	
18-Sep	0.00	0.00	0.00	0.2	
19-Sep	0.00	0.00	0.00	0.22	
20-Sep	0.00	0.00	0.00	0.24	
21-Sep	8.21	8.21	6.77	0.04	
22-Sep	1.46	1.46	0.55	0.05	
23-Sep	0.04	0.04	0.00	0.07	
24-Sep	0.00	0.00	0.00	0.09	
25-Sep	0.00	0.00	0.00	0.21	
26-Sep	0.00	0.00	0.00	0.13	
27-Sep	0.00	0.00	0.00	0.15	
28-Sep	0.00	0.00	0.00	0.07	
29-Sep	0.00	0.00	0.00	0.07	
30-Sep	0.00	0.00	0.00	0.16	
sum	12.86	12.86	7.82	4.26	
Volume, ac-ft		110.86	55.37		
Total Vol, ac-ft		166.23			Pan Evaporation from Sulphur Mesonet

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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	0.00	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	0.00	1.60	0.00	0.00	0.00	0.00
October-18		0.00					0.00	0.00		0.00	0.00		0.00
November-18		0.00					0.00	0.00		0.00	0.00		0.00
December-18		0.00					0.00	0.00		0.00	0.00		0.00

Pit Sump Volumes

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	0.27	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	0.21	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		125	325		0.00	4	50	50	0.00	0.00			750		0.00	0.00	1.7	0.00	
November-18		125	325		0.00	4	50	50	0.00	0.00			750		0.00	0.00	1.7	0.00	
December-18		125	325		0.00	4	50	50	0.00	0.00			750		0.00	0.00	1.7	0.00	

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July Shipments			August Shipments			September Shipments		
	Tons Shipped	Ac-ft of water shipped		Tons Shipped	Ac-ft of water shipped		Tons Shipped	Ac-ft of water shipped
Base Products	-	-	Base Products	1,432	0.035	Base Products	1,480	0.036
Coarse			Coarse			Coarse		
Aggregates	214,606	2.579	Aggregates	285,330	3.429	Aggregates	281,108	3.379
Fine			Fine			Fine		
Aggregates	41,845	1.329	Aggregates	18,595	0.591	Aggregates	30,763	0.977
	256,451	3.909		305,358	4.055		313,351	4.392

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