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Oklahoma Water Resources Board

June 27, 2018

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

Subject: Vulcan North Troy Annual Water Report Revisions

Mr. Cogburn,

Attached please find the revised annual water reports for the Vulcan North Troy mine site for 2015, 2016 and 2017. The revision are being submitted to update the actual precipitation watershed area for the mine. In addition the revisions account for stormwater storage from one calendar year to the next, the evaporation associated and clarify water augmented to the creek.

If you have further questions please feel free to contact us.

Sincerely,

Eddie Saucedo

Eddie Saucedo
Environmental Services Manager
Vulcan Materials Company

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ANNUAL REPORT 2015
North Troy Quarry
Mill Creek, OK
Vulcan Materials Company

Revised June 26, 2018

2015 ANNUAL REPORT

Oklahoma Water Resources Board

VMC North Troy 2015 Monitoring Report

All volumes are in acre-feet.

	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, Acre-ft
January-15	165.63	153.84	0.00	188.13	0.00	4.21	0.00	0.00	219.50
February-15	165.61	159.84	0.00	169.85	0.00	4.55	0.00	0.00	219.50
March-15	192.54	185.21	48.28	43.93	104.85	6.81	0.00	0.81	219.50
1st QTR Totals	523.78	478.89	48.28	381.91	104.85	15.68	0.00	0.81	N/A
April-15	181.71	130.59	0.00	98.42	67.33	6.51	0.00	0.00	219.50
May-15	370.11	88.02	0.00	338.78	15.90	10.31	0.00	0.00	219.50
June-15	318.09	131.24	0.00	318.09	0.00	15.50	0.00	0.00	219.50
2nd QTR Totals	869.81	403.45	0.00	756.27	83.23	32.31	0.00	0.00	N/A
July-16	283.45	127.48	38.51	254.93	0.00	15.60	0.00	2.00	218.50
August-15	232.68	230.25	49.26	183.42	0.00	12.92	0.00	0.00	218.50
September-15	255.02	13.21	105.28	149.78	0.00	12.08	0.00	1.75	219.50
3rd QTR Totals	781.15	569.55	183.03	588.11	0.00	40.61	0.00	3.75	N/A
October-15	283.38	200.53	32.04	177.13	74.21	13.51	0.00	0.00	219.50
November-15	103.42	28.43	0.00	103.42	0.00	8.84	0.00	0.00	219.50
December-15	320.87	54.42	35.68	137.55	0.00	6.74	0.00	1.44	219.50
4th QTR Totals	707.47	495.21	67.73	418.10	74.21	29.10	0.00	1.44	N/A
2015 Totals	2882.31	1976.90	307.04	2144.39	262.09	117.68	0.00	5.80	219.50
2015 Totals (adj)	2882.31	2234.11	307.04	2144.39	262.09	117.68	0.00	5.80	219.50

1Q notes

Weather Station - Battery failed
Pond Transducer cable corroded

2Q notes

New weather station installed

3Q notes

Corrected Data Typo on March 2015 Pit diversion total

4Q notes

Well transducer pinched by Well cable

(a)

Used pan evaporation data from Mesonet - Sulphur based on TRP comments

(adj)

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.

Annual total adjustment for stormwater carried over to next calendar year

Water Balance = -479.41 Total Net Reported Consumptive Use

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

revised 6-20-2018

MILL CREEK 2015 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
3/4/2015	7:40 AM	3/6/2015	3:15 PM	572490000	579700000	22.13		USGS 7331200	7:30 AM	< 6	2.8
3/9/2015	6:30 AM	3/11/2015	1:30 PM	579700000	585830000	18.81		USGS 7331200	6:00 AM	< 6	3.7
3/12/2015	6:55 AM	3/14/2015	1:10 PM	585830000	593240000	22.74		USGS 7331200	6:00 AM	< 6	4.2
3/18/2015	8:30 AM	3/18/2015	9:05 AM	593240000	593330000	0.28		USGS 7331200	8:00 AM	< 6	5.1
3/26/2015	4:45 PM	3/29/2015	9:00 PM	617010000	626960000	30.14	0.40	USGS 7331200	4:00 PM	6.13	9.7
Note: Flowrate dropped to 8.7 cfs by 6pm on March 26, 2015. Flowrate stayed below 9.0 for duration of augmentation.											
3/30/2015	1:00 PM	3/31/2015	3:30 PM	626960000	630400000	10.56		USGS 7331200	12:30 PM	6.01	5.6
4/4/2015	7:50 AM	4/11/2015	8:20 AM	630400000	652340000	67.33		USGS 7331200	7:00 AM	< 6	5.1
4/13/2015	12:05 PM	4/14/2015	12:00 AM	652340000	656570000		12.98	USGS 7331200	11:30 AM	8.2	318
4/15/2015	7:15 AM	4/15/2015	1:50 PM	656570000	657540000		2.98	USGS 7331200	7:00 AM	6.3	17
5/1/2015	7:50 AM	5/2/2015	8:00 PM	693210000	695160000		5.98	USGS 7331200	7:30 AM	6.14	9.8
5/4/2015	6:10 AM	5/5/2015	8:00 AM	695160000	700340000	15.90		USGS 7331200	5:30 AM	6.03	6.3
5/6/2015	11:30 AM	5/7/2015	8:55 AM	700340000	703100000		8.47	USGS 7331200	11:00 AM	6.67	40
June 2015			No Augmentation this month								
July 2015			No Augmentation this month								
August 2015			No Augmentation this month								
September 2015			No Augmentation this month								
10/12/2015	5:15PM	10/21/2015	12:25PM	1199020000	1223200000	74.21		USGS 7331200	5:00PM	6.64	2.4
November 2015			No Augmentation this month								
12/22/2015	4:20PM	12/27/2015	1:20PM	1354500000	1371210000		51.28	USGS 7331200	4:00PM	7	23
				Total		262.09	82.09				

344.18 Pumped to Mill Creek
 262.09 Augmented to Mill Creek
 905.41 Stormwater collected entering pit
 82.09 Stormwater pumped to Mill Creek

Revised 6-2018 : displayed complete pumping record
 Displayed augmentation totals

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North Troy Monthly Water Data Sheet

Rows 11-57 - Precipitation Data
 Rows 60-76 - Water Data
 Rows 70-84 - Pit Sump Volumes
 Rows 91-105 - Settling Cell Evaporation
 Rows 107-144 - Monthly Shipments
 Rows 146-164 - Product Moisture Content

**

Revised 6-20-2018

January Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS									
Hydrologic Soil Group		Land Use		D		Daily			
AMC Condition		Gravel road		II (ave)		Evaporation, in.			
CN (pit fringe)		88		100					
S (pit fringe)		1.343333334		0					
P4 - Direct Interception >95 ft deep		91.09							
Pit fringe (area drains to pit)		97.30							
Drainage to P4 (total area)		168.39							
Date	Precip. in.	Quarry area Runoff, in.	Fringe area Runoff, in.	Evaporation, in.	Daily Evaporation, in.	Runoff formula	Runoff formula	Runoff formula	Runoff formula
1-Jan	0.00	0.00	0.00	0.00	0.02	$Pe = (P-0.25)^2 / (P+0.85)$	$Pe = (P-0.25)^2 / (P+0.85)$	$S = (1000/CN)-10$	$S = (1000/CN)-10$
2-Jan	0.00	0.00	0.00	0.00	0.02				
3-Jan	0.04	0.04	0.00	0.00	0.03				
4-Jan	0.00	0.00	0.00	0.00	0.07				
5-Jan	0.00	0.00	0.00	0.00	0.08				
6-Jan	0.00	0.00	0.00	0.00	0.08				
7-Jan	0.00	0.00	0.00	0.00	0.09				
8-Jan	0.00	0.00	0.00	0.00	0.07				
9-Jan	0.00	0.00	0.00	0.00	0.08				
10-Jan	0.00	0.00	0.00	0.00	0.07				
11-Jan	0.00	0.00	0.00	0.00	0.02				
12-Jan	0.00	0.00	0.00	0.00	0.03				
13-Jan	0.00	0.00	0.00	0.00	0.06				
14-Jan	0.00	0.00	0.00	0.00	0.04				
15-Jan	0.00	0.00	0.00	0.00	0.07				
16-Jan	0.00	0.00	0.00	0.00	0.12				
17-Jan	0.00	0.00	0.00	0.00	0.16				
18-Jan	0.00	0.00	0.00	0.00	0.18				
19-Jan	0.00	0.00	0.00	0.00	0.1				
20-Jan	0.00	0.00	0.00	0.00	0.16				
21-Jan	0.10	0.10	0.00	0.00	0.09				
22-Jan	0.49	0.49	0.00	0.00	0.03				
23-Jan	0.00	0.00	0.00	0.00	0.08				
24-Jan	0.00	0.00	0.00	0.00	0.09				
25-Jan	0.00	0.00	0.00	0.00	0.16				
26-Jan	0.00	0.00	0.00	0.00	0.15				
27-Jan	0.00	0.00	0.00	0.00	0.12				
28-Jan	0.00	0.00	0.00	0.00	0.16				
29-Jan	0.00	0.00	0.00	0.00	0.15				
30-Jan	0.00	0.00	0.00	0.00	0.07				
31-Jan	0.94	0.94	0.00	0.00	0.07				
sum	1.58	1.58	0.00	0.00	2.76				
Volume, ac-ft		11.99	0.00						
Total Vol, ac-ft		11.99	0.00						

Composite RCN

PIT RUNOFF ASSUMPTIONS

Hydrologic Soil Group	D
Land Use	Gravel road
AMC Condition	II (ave)
CN (pit fringe)	88
S (pit fringe)	100
S (pit)	1.343333334
P4 - Direct Interception >95 ft deep	91.09
Pit fringe (area drains to pit)	97.30
Drainage to P4 (total area)	168.39

Date	Precip. in.	Quarry area Runoff, in.	Fringe area Runoff, in.	Daily Evaporation, in.	Runoff formula	Runoff formula	Runoff formula	Runoff formula
1-Feb	0.12	0.12	0.00	0.08	$Pe = (P-0.25)^2 / (P+0.85)$	$Pe = (P-0.25)^2 / (P+0.85)$	$S = (1000/CN)-10$	$S = (1000/CN)-10$
2-Feb	0.00	0.00	0.00	0.08				
3-Feb	0.00	0.00	0.00	0.13				
4-Feb	0.00	0.00	0.00	0.04				
5-Feb	0.00	0.00	0.00	0.04				
6-Feb	0.00	0.00	0.00	0.12				
7-Feb	0.00	0.00	0.00	0.15				
8-Feb	0.00	0.00	0.00	0.15				
9-Feb	0.00	0.00	0.00	0.15				
10-Feb	0.00	0.00	0.00	0.17				
11-Feb	0.00	0.00	0.00	0.12				
12-Feb	0.00	0.00	0.00	0.13				
13-Feb	0.00	0.00	0.00	0.17				
14-Feb	0.00	0.00	0.00	0.21				
15-Feb	0.50	0.50	0.00	0.12				
16-Feb	0.03	0.03	0.00	0.03				
17-Feb	0.00	0.00	0.00	0.09				
18-Feb	0.00	0.00	0.00	0.03				
19-Feb	0.00	0.00	0.00	0.16				
20-Feb	0.00	0.00	0.00	0.07				
21-Feb	0.00	0.00	0.00	0.12				
22-Feb	0.06	0.06	0.00	0.07				
23-Feb	0.00	0.00	0.00	0.04				
24-Feb	0.03	0.03	0.00	0.04				
25-Feb	0.00	0.00	0.00	0.08				
26-Feb	0.00	0.00	0.00	0.09				
27-Feb	0.00	0.00	0.00	0.12				
28-Feb	0.00	0.00	0.00	0.02				
sum	0.78	0.78	0.00	2.85				
Volume, ac-ft		4.77	0.00					
Total Vol, ac-ft		4.77	0.00					

Blue cells contain formulas

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Ontario Water Resources Board

March Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS	
Hydrologic Soil Group	D
Land Use	*gravel road"
AMC Condition	II (ave)
CN (pit fringe)	88
CN (pit)	100
S (pit fringe)	1.963636384
S (pit)	0
Pit - Direct Interception (>95 ft deep)	91.09
Pit fringe (area drains to pit)	97.30
Drainage to Pit (total area)	188.39

Date	Precip. in.	Quarry area Runoff, in.	Fringe area Runoff, in.	Daily Evaporation, in.
1-Mar	0.40	0.40	0.00	0.03
2-Mar	0.10	0.10	0.00	0.03
3-Mar	0.04	0.04	0.00	0.04
4-Mar	0.52	0.52	0.00	0.06
5-Mar	0.05	0.05	0.00	0.08
6-Mar	0.00	0.00	0.00	0.12
7-Mar	0.00	0.00	0.00	0.17
8-Mar	0.00	0.00	0.00	0.14
9-Mar	0.46	0.46	0.00	0.03
10-Mar	0.00	0.00	0.00	0.06
11-Mar	0.00	0.00	0.00	0.16
12-Mar	0.00	0.00	0.00	0.15
13-Mar	0.72	0.72	0.00	0.03
14-Mar	0.01	0.01	0.00	0.12
15-Mar	0.00	0.00	0.00	0.11
16-Mar	0.00	0.00	0.00	0.2
17-Mar	0.00	0.00	0.00	0.17
18-Mar	0.35	0.35	0.00	0.05
19-Mar	0.02	0.02	0.00	0.03
20-Mar	0.18	0.18	0.00	0.09
21-Mar	0.00	0.00	0.00	0.08
22-Mar	0.29	0.29	0.00	0.13
23-Mar	0.00	0.00	0.00	0.22
24-Mar	0.00	0.00	0.00	0.33
25-Mar	0.39	0.39	0.00	0.28
26-Mar	0.03	0.03	0.00	0.22
27-Mar	0.00	0.00	0.00	0.13
28-Mar	0.00	0.00	0.00	0.26
29-Mar	0.00	0.00	0.00	0.32
30-Mar	0.00	0.00	0.00	0.25
31-Mar	0.00	0.00	0.00	0.24
sum	3.80	3.80	0.00	4.91
Volume, ac-ft		27.33	0.00	
Total Vol, ac-ft		27.33	0.00	

Runoff formula
 $Pe = (P-0.2S)^2 / (P+0.8S)$
 $S = (10000/CN) - 10$

Blue cells contain form

Blue cells contain formulas

April Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS	
Hydrologic Soil Group	D
Land Use	*gravel road"
AMC Condition	II (ave)
CN (pit fringe)	88
CN (pit)	100
S (pit fringe)	1.963636384
S (pit)	0
Pit - Direct Interception (>95 ft deep)	91.09
Pit fringe (area drains to pit)	97.30
Drainage to Pit (total area)	188.39

Date	Precip. in.	Quarry area Runoff, in.	Fringe area Runoff, in.	Daily Evaporation, in.
1-Apr	0.01	0.01	0.00	0.18
2-Apr	0.00	0.00	0.00	0.28
3-Apr	0.00	0.00	0.00	0.28
4-Apr	0.00	0.00	0.00	0.25
5-Apr	0.28	0.28	0.00	0.07
6-Apr	0.01	0.01	0.00	0.18
7-Apr	0.00	0.00	0.00	0.22
8-Apr	0.01	0.01	0.00	0.17
9-Apr	0.00	0.00	0.00	0.28
10-Apr	0.00	0.00	0.00	0.25
11-Apr	0.00	0.00	0.00	0.27
12-Apr	0.00	0.00	0.00	0.22
13-Apr	2.30	2.30	1.21	0.13
14-Apr	0.23	0.23	0.00	0.07
15-Apr	0.06	0.06	0.00	0.17
16-Apr	0.00	0.00	0.00	0.18
17-Apr	0.33	0.33	0.00	0.14
18-Apr	0.36	0.36	0.00	0.21
19-Apr	0.00	0.00	0.00	0.17
20-Apr	0.00	0.00	0.00	0.21
21-Apr	0.02	0.02	0.00	0.2
22-Apr	0.06	0.06	0.00	0.18
23-Apr	0.14	0.14	0.00	0.05
24-Apr	0.60	0.60	0.00	0.07
25-Apr	0.00	0.00	0.00	0.27
26-Apr	0.35	0.35	0.00	0.23
27-Apr	0.63	0.63	0.00	0.07
28-Apr	0.03	0.03	0.00	0.1
29-Apr	0.02	0.02	0.00	0.21
30-Apr	0.00	0.00	0.00	0.21
sum	5.44	5.44	1.21	5.53
Volume, ac-ft		41.29	9.83	
Total Vol, ac-ft		51.12	9.83	

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May Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS	
Hydrologic Soil Group	D
Land Use	gravel road
AMC Condition	II (ave)
CN (pit fringe)	88
CN (pit)	100
S (pit fringe)	1,363,636
S (pit)	0
Pit - Direct Interception (>95 ft deep)	91.09
Pit fringe (area drains to pit)	97.30
Drainage to Pit (total area)	188,399

Date	Precip, in.	Quarry area		Daily Evaporation, in.
		Runoff, in.	Fringe area	
1-May	0.00	0.00	0.00	0.23
2-May	0.00	0.00	0.00	0.25
3-May	0.00	0.00	0.00	0.31
4-May	0.00	0.00	0.00	0.27
5-May	1.36	1.36	0.00	0.17
6-May	0.46	0.46	0.00	0.22
7-May	3.85	3.85	2.89	0.16
8-May	2.85	2.85	1.89	0.14
9-May	0.82	0.82	0.00	0.08
10-May	1.75	1.75	0.77	0.09
11-May	1.01	1.01	0.00	0.26
12-May	0.00	0.00	0.00	0.2
13-May	0.00	0.00	0.00	0.08
14-May	0.00	0.00	0.00	0.21
15-May	0.07	0.07	0.00	0.17
16-May	0.31	0.31	0.00	0.17
17-May	0.90	0.90	0.00	0.24
18-May	0.01	0.01	0.00	0.24
19-May	1.06	1.06	0.00	0.13
20-May	3.92	3.92	2.66	0.11
21-May	0.03	0.03	0.00	0.22
22-May	1.70	1.70	0.73	0.05
23-May	0.07	0.07	0.00	0.07
24-May	2.38	2.38	1.28	0.11
25-May	0.65	0.65	0.00	0.13
26-May	0.00	0.00	0.00	0.22
27-May	0.10	0.10	0.00	0.14
28-May	2.01	2.01	1.06	0.12
29-May	0.71	0.71	0.00	0.11
30-May	0.01	0.01	0.00	0.12
31-May	0.00	0.00	0.00	0.17
sum	25.93	25.93	16.76	5.27
Volume, ac-ft	196.83	87.26		
Total Vol, ac-ft	284.09			

Blue cells contain formulas

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5.27

June Precipitation/Evaporation Data

PIT RUNOFF ASSUMPTIONS	
Hydrologic Soil Group	D
Land Use	gravel road
AMC Condition	II (ave)
CN (pit fringe)	88
CN (pit)	100
S (pit fringe)	1,363,636
S (pit)	0
Pit - Direct Interception (>95 ft deep)	91.09
Pit fringe (area drains to pit)	97.30
Drainage to Pit (total area)	188,399

Date	Precip, in.	Quarry area		Daily Evaporation, in.
		Runoff, in.	Fringe area	
1-Jun	0.00	0.00	0.00	0.24
2-Jun	0.00	0.00	0.00	0.29
3-Jun	0.00	0.00	0.00	0.32
4-Jun	0.00	0.00	0.00	0.31
5-Jun	0.00	0.00	0.00	0.27
6-Jun	0.00	0.00	0.00	0.28
7-Jun	0.00	0.00	0.00	0.31
8-Jun	0.00	0.00	0.00	0.24
9-Jun	0.00	0.00	0.00	0.13
10-Jun	0.00	0.00	0.00	0.33
11-Jun	0.00	0.00	0.00	0.39
12-Jun	0.00	0.00	0.00	0.35
13-Jun	0.97	0.97	0.00	0.22
14-Jun	1.18	1.18	0.00	0.22
15-Jun	0.85	0.85	0.00	0.22
16-Jun	0.80	0.80	0.00	0.11
17-Jun	5.66	5.66	4.30	0.04
18-Jun	1.66	1.66	0.70	0.19
19-Jun	0.00	0.00	0.00	0.26
20-Jun	0.00	0.00	0.00	0.32
21-Jun	0.07	0.07	0.00	0.12
22-Jun	0.00	0.00	0.00	0.35
23-Jun	0.00	0.00	0.00	0.32
24-Jun	0.00	0.00	0.00	0.33
25-Jun	0.00	0.00	0.00	0.34
26-Jun	0.08	0.08	0.00	0.27
27-Jun	0.02	0.02	0.00	0.29
28-Jun	0.00	0.00	0.00	0.28
29-Jun	0.00	0.00	0.00	0.26
30-Jun	0.66	0.66	0.00	0.29
sum	11.95	11.95	5.00	8.14
Volume, ac-ft	90.71	40.53		
Total Vol, ac-ft	131.24			

Blue cells contain formulas

Rainfall Data for 6/1-6/9 taken from Mill Creek stream gage due to weather station malfunction.

8.14

July Precipitation/Evaporation Data

Hydrologic Soil Group		D
Land Use	Gravel road	
AMC Condition	II (ave)	88
CN (pt fringe)	100	area draining into pit
CN (pt fringe)	100	area with direct interception
S (pt fringe)	1,300,000	area draining into pit
S (pt fringe)	0	area with direct interception
Pit - Direct Interception (>95 ft deep)	91.09	subject to refinement
Pit fringe (area drains to pit)	97.30	subject to refinement
Drainage to Pit (total area)	184.39	subject to refinement

Date	Query area fringe area		Daily
	Precip. in Runoff, in.	Runoff, in.	
1-Jul	0.00	0.00	0.00
2-Jul	0.00	0.00	0.00
3-Jul	6.57	4.21	0.24
4-Jul	0.00	0.00	0.00
5-Jul	0.00	0.00	0.00
6-Jul	0.00	0.00	0.00
7-Jul	2.81	1.70	0.07
8-Jul	4.01	2.34	0.07
9-Jul	0.00	0.00	0.00
10-Jul	0.00	0.00	0.00
11-Jul	0.00	0.00	0.00
12-Jul	0.00	0.00	0.00
13-Jul	0.00	0.00	0.00
14-Jul	0.00	0.00	0.00
15-Jul	0.00	0.00	0.00
16-Jul	0.00	0.00	0.00
17-Jul	0.00	0.00	0.00
18-Jul	0.00	0.00	0.00
19-Jul	0.00	0.00	0.00
20-Jul	0.00	0.00	0.00
21-Jul	0.00	0.00	0.00
22-Jul	0.00	0.00	0.00
23-Jul	0.00	0.00	0.00
24-Jul	0.00	0.00	0.00
25-Jul	0.00	0.00	0.00
26-Jul	0.00	0.00	0.00
27-Jul	0.00	0.00	0.00
28-Jul	0.00	0.00	0.00
29-Jul	0.00	0.00	0.00
30-Jul	0.00	0.00	0.00
31-Jul	0.00	0.00	0.00
sum	12.82	7.63	0.31
Volume, ac-ft	146.89	79.17	6.734
Total Vol, ac-ft	146.89	79.17	6.734

Blue cells contain formulas

August Precipitation/Evaporation Data

Hydrologic Soil Group		D
Land Use	Gravel road	
AMC Condition	II (ave)	88
CN (pt fringe)	100	area draining into pit
CN (pt fringe)	100	area with direct interception
S (pt fringe)	1,300,000	area draining into pit
S (pt fringe)	0	area with direct interception
Pit - Direct Interception (>95 ft deep)	91.09	subject to refinement
Pit fringe (area drains to pit)	97.30	subject to refinement
Drainage to Pit (total area)	184.39	subject to refinement

Date	Query area fringe area		Daily
	Precip. in Runoff, in.	Runoff, in.	
1-Aug	0.00	0.00	0.00
2-Aug	0.00	0.00	0.00
3-Aug	0.00	0.00	0.00
4-Aug	0.00	0.00	0.00
5-Aug	0.00	0.00	0.00
6-Aug	0.00	0.00	0.00
7-Aug	0.00	0.00	0.00
8-Aug	0.00	0.00	0.00
9-Aug	0.00	0.00	0.00
10-Aug	0.00	0.00	0.00
11-Aug	0.00	0.00	0.00
12-Aug	0.00	0.00	0.00
13-Aug	0.00	0.00	0.00
14-Aug	0.00	0.00	0.00
15-Aug	0.00	0.00	0.00
16-Aug	0.00	0.00	0.00
17-Aug	0.00	0.00	0.00
18-Aug	0.00	0.00	0.00
19-Aug	0.00	0.00	0.00
20-Aug	0.00	0.00	0.00
21-Aug	0.00	0.00	0.00
22-Aug	0.00	0.00	0.00
23-Aug	0.00	0.00	0.00
24-Aug	0.00	0.00	0.00
25-Aug	0.00	0.00	0.00
26-Aug	0.00	0.00	0.00
27-Aug	0.00	0.00	0.00
28-Aug	0.00	0.00	0.00
29-Aug	0.00	0.00	0.00
30-Aug	0.00	0.00	0.00
31-Aug	0.00	0.00	0.00
sum	0.00	0.00	0.00
Volume, ac-ft	2.43	0.00	4.023
Total Vol, ac-ft	2.43	0.00	4.023

Blue cells contain formulas

September Precipitation/Evaporation Data

Hydrologic Soil Group		D
Land Use	Gravel road	
AMC Condition	II (ave)	88
CN (pt fringe)	100	area draining into pit
CN (pt fringe)	100	area with direct interception
S (pt fringe)	1,300,000	area draining into pit
S (pt fringe)	0	area with direct interception
Pit - Direct Interception (>95 ft deep)	91.09	subject to refinement
Pit fringe (area drains to pit)	97.30	subject to refinement
Drainage to Pit (total area)	184.39	subject to refinement

Date	Query area fringe area		Daily
	Precip. in Runoff, in.	Runoff, in.	
1-Sep	0.00	0.00	0.00
2-Sep	0.00	0.00	0.00
3-Sep	0.00	0.00	0.00
4-Sep	0.00	0.00	0.00
5-Sep	0.00	0.00	0.00
6-Sep	0.00	0.00	0.00
7-Sep	0.00	0.00	0.00
8-Sep	0.00	0.00	0.00
9-Sep	0.00	0.00	0.00
10-Sep	0.00	0.00	0.00
11-Sep	0.00	0.00	0.00
12-Sep	0.00	0.00	0.00
13-Sep	0.00	0.00	0.00
14-Sep	0.00	0.00	0.00
15-Sep	0.00	0.00	0.00
16-Sep	0.00	0.00	0.00
17-Sep	0.00	0.00	0.00
18-Sep	0.00	0.00	0.00
19-Sep	0.00	0.00	0.00
20-Sep	0.00	0.00	0.00
21-Sep	0.00	0.00	0.00
22-Sep	0.00	0.00	0.00
23-Sep	0.00	0.00	0.00
24-Sep	0.00	0.00	0.00
25-Sep	0.00	0.00	0.00
26-Sep	0.00	0.00	0.00
27-Sep	0.00	0.00	0.00
28-Sep	0.00	0.00	0.00
29-Sep	0.00	0.00	0.00
30-Sep	0.00	0.00	0.00
sum	0.00	0.00	0.00
Volume, ac-ft	1.74	1.74	1.39
Total Vol, ac-ft	1.74	1.74	1.39

Blue cells contain formulas

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October Precipitation/Evaporation Data

Hydrologic Soil Group		D	
Land Use	gravel road	II (ave)	III (ave)
AMC Condition	86	100	1,303,938
CN (1st fringe)	area draining into pit	area with direct interception	area draining into pit
CN (2nd fringe)	area with direct interception	area with direct interception	area draining into pit
S (pit fringe)	area with direct interception	subject to refinement	subject to refinement
Pit - Direct Interception (>95 ft deep)	91.09	97.30	188.39
Pit fringe (area drains to pit)			
Drainage to Pit (total area)			

Date	Quarry area-fringe area		Daily
	Precip. in Runoff, in.	Runoff, in.	
1-Oct	0.22	0.12	0.07
2-Oct	0.00	0.00	0.18
3-Oct	0.00	0.00	0.15
4-Oct	0.00	0.00	0.06
5-Oct	0.00	0.00	0.13
6-Oct	0.00	0.00	0.14
7-Oct	0.00	0.00	0.11
8-Oct	0.00	0.00	0.08
9-Oct	0.00	0.00	0.13
10-Oct	0.00	0.00	0.24
11-Oct	0.00	0.00	0.19
12-Oct	0.00	0.00	0.15
13-Oct	0.00	0.00	0.21
14-Oct	0.00	0.00	0.24
15-Oct	0.00	0.00	0.23
16-Oct	0.00	0.00	0.22
17-Oct	0.00	0.00	0.31
18-Oct	0.00	0.00	0.34
19-Oct	0.00	0.00	0.27
20-Oct	0.00	0.00	0.19
21-Oct	2.08	2.08	1.53
22-Oct	0.12	0.12	0.05
23-Oct	1.81	1.81	0.66
24-Oct	0.00	0.00	0.17
25-Oct	0.00	0.00	0.14
26-Oct	0.00	0.00	0.06
27-Oct	0.00	0.00	0.12
28-Oct	0.00	0.00	0.11
29-Oct	3.12	3.12	1.83
30-Oct	0.00	0.00	0.00
31-Oct	7.05	7.05	3.82
sum	14.93	14.93	29.33
Volume, ac-ft	41.48	41.48	74.96
Total Vol, ac-ft	54.42	54.42	74.96

* Used Mesonet Pan Evaporation - Sulphur

November Precipitation/Evaporation Data

Hydrologic Soil Group		D	
Land Use	gravel road	II (ave)	III (ave)
AMC Condition	86	100	1,303,938
CN (1st fringe)	area draining into pit	area with direct interception	area draining into pit
CN (2nd fringe)	area with direct interception	area with direct interception	area draining into pit
S (pit fringe)	area with direct interception	subject to refinement	subject to refinement
Pit - Direct Interception (>95 ft deep)	91.09	97.30	188.39
Pit fringe (area drains to pit)			
Drainage to Pit (total area)			

Date	Quarry area-fringe area		Daily
	Precip. in Runoff, in.	Runoff, in.	
1-Nov	0.00	0.00	0.06
2-Nov	0.00	0.00	0.11
3-Nov	0.00	0.00	0.04
4-Nov	0.00	0.00	0.04
5-Nov	0.47	0.47	0.04
6-Nov	0.00	0.00	0.12
7-Nov	0.04	0.04	0.00
8-Nov	0.00	0.00	0.11
9-Nov	0.00	0.00	0.12
10-Nov	0.00	0.00	0.13
11-Nov	0.00	0.00	0.26
12-Nov	0.00	0.00	0.13
13-Nov	0.00	0.00	0.4
14-Nov	0.00	0.00	0.12
15-Nov	0.20	0.20	0.00
16-Nov	0.36	0.36	0.05
17-Nov	1.38	1.38	0.50
18-Nov	0.00	0.00	0.18
19-Nov	0.00	0.00	0.18
20-Nov	0.00	0.00	0.15
21-Nov	0.00	0.00	0.11
22-Nov	0.00	0.00	0.15
23-Nov	0.00	0.00	0.04
24-Nov	0.00	0.00	0.06
25-Nov	0.00	0.00	0.12
26-Nov	0.92	0.92	0.07
27-Nov	2.71	2.71	-0.02
28-Nov	1.04	1.04	0.03
29-Nov	0.45	0.45	0.02
30-Nov	0.04	0.04	0.02
sum	7.88	7.88	3.04
Volume, ac-ft	58.30	58.30	16.70
Total Vol, ac-ft	74.96	74.96	16.70

* Used Mesonet Pan Evaporation - Sulphur

December Precipitation/Evaporation Data

Hydrologic Soil Group		D	
Land Use	gravel road	II (ave)	III (ave)
AMC Condition	86	100	1,303,938
CN (1st fringe)	area draining into pit	area with direct interception	area draining into pit
CN (2nd fringe)	area with direct interception	area with direct interception	area draining into pit
S (pit fringe)	area with direct interception	subject to refinement	subject to refinement
Pit - Direct Interception (>95 ft deep)	91.09	97.30	188.39
Pit fringe (area drains to pit)			
Drainage to Pit (total area)			

Date	Quarry area-fringe area		Daily
	Precip. in Runoff, in.	Runoff, in.	
1-Dec	0.00	0.00	0.04
2-Dec	0.00	0.00	0.06
3-Dec	0.00	0.00	0.07
4-Dec	0.00	0.00	0.07
5-Dec	0.00	0.00	0.11
6-Dec	0.00	0.00	0.09
7-Dec	0.00	0.00	0.09
8-Dec	0.00	0.00	0.15
9-Dec	0.00	0.00	0.1
10-Dec	0.00	0.00	0.09
11-Dec	0.00	0.00	0.12
12-Dec	0.00	0.00	0.1
13-Dec	0.48	0.48	0.01
14-Dec	0.00	0.00	0.15
15-Dec	0.00	0.00	0.11
16-Dec	0.00	0.00	0.07
17-Dec	0.00	0.00	0.06
18-Dec	0.00	0.00	0.05
19-Dec	0.00	0.00	0.15
20-Dec	0.00	0.00	0.11
21-Dec	0.00	0.00	0.07
22-Dec	0.00	0.00	0.14
23-Dec	0.00	0.00	0.14
24-Dec	0.00	0.00	0.15
25-Dec	0.00	0.00	0.04
26-Dec	1.90	1.90	0.71
27-Dec	1.88	1.88	0.05
28-Dec	1.38	1.38	0.02
29-Dec	0.04	0.04	0.00
30-Dec	0.00	0.00	0.05
31-Dec	0.00	0.00	0.05
sum	8.46	8.46	2.82
Volume, ac-ft	41.48	41.48	12.87
Total Vol, ac-ft	54.42	54.42	12.87

* 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 2002-502	North Well Permit 20060601A
January-15	15.35	11.99	4.35	0.65	185.51	0.00	1.87	2.22	1.90	0.00	0.00	0.00	0.00
February-15	18.61	5.77	4.81	0.65	185.91	0.00	1.94	2.22	0.39	0.00	0.00	0.00	0.00
March-15	18.54	27.33	4.79	48.74	41.72	184.63	2.94	3.36	0.61	0.00	0.00	0.00	0.00
April-15	16.11	51.12	11.63	0.00	184.42	0.00	4.23	2.28	0.00	0.00	0.00	0.00	0.00
May-15	176.11	284.08	4.81	0.00	184.76	0.00	8.69	1.62	0.00	0.00	0.00	0.00	0.00
June-15	131.24	131.24	2.71	0.00	318.06	0.00	13.42	1.30	0.00	0.00	0.00	0.00	0.00
July-15	245.43	165.97	2.74	38.51	214.93	0.00	11.10	3.83	0.66	0.00	0.00	2.00	0.00
August-15	237.88	2.41	2.84	49.28	183.42	0.00	6.63	4.84	1.44	0.00	0.00	0.00	0.00
September-15	255.05	13.21	3.41	105.28	149.76	0.00	5.55	4.41	2.10	0.00	0.00	1.75	0.00
October-15	231.94	82.85	2.87	33.04	177.13	74.21	8.12	3.65	1.77	0.00	0.00	0.00	0.00
November-15	103.42	74.99	3.03	0.00	103.42	0.00	5.01	2.28	1.51	0.00	0.00	0.00	0.00
December-15	307.67	54.42	4.33	35.66	37.15	0.00	4.65	1.43	0.66	0.00	0.00	1.44	0.00

Pit Sump Volumes

	Month End Depth-to-Water, Ft	West Sump			305 Sump			New Freshwater Pond			Total Evaporation, ac-ft	Pit Area Acres	Total Evaporation, ac-ft	Total Evaporation, ac-ft
		Length, Ft	Width, Ft	Evaporation, ac-ft	Length, Ft	Width, Ft	Evaporation, ac-ft	Length, Ft	Width, Ft	Evaporation, ac-ft				
January-15	15.35	125	125	325	4	50	0.21	50	50	0.31	475	750	2.10	2.10
February-15	22.34	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44
March-15	18.61	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44
April-15	16.11	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44
May-15	117.41	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44
June-15	117.41	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44
July-15	16.11	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44
August-15	16.11	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44
September-15	117.41	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44
October-15	117.41	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44
November-15	16.11	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44
December-15	14.81	125	125	325	4	50	0.21	50	50	0.31	475	750	1.44	1.44

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January Shipments	February Shipments	March Shipments	April Shipments
Base Products Coarse Aggregates	Base Products Coarse Aggregates Fine	Base Products Coarse Aggregates Fine Aggregates	Base Products Coarse Aggregates Fine Aggregates
Tons Shipped 883 120,982 13,133 135,098	Tons Shipped 788 188,985 5,983 173,736	Tons Shipped 1,635 163,925 42,643 208,103	Tons Shipped 2,585 170,224 5,492 178,301
Ac-ft of water shipped 0.624 1.454 0.417 1.696	Ac-ft of water shipped 0.019 2.007 0.180 2.216	Ac-ft of water shipped 0.040 1.970 1.352 3.362	Ac-ft of water shipped 0.063 2.046 0.174 2.284

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May Shipments June Shipments July Shipments August Shipments

	Tons Shipped	Ac-ft of water shipped	Tons Shipped	Ac-ft of water shipped	Tons Shipped	Ac-ft of water shipped	Tons Shipped	Ac-ft of water shipped		
Base Products	1,992	0.049	1,200	0.029	Base Products	3,484	0.085	Base Products	2,216	0.054
Coarse Aggregates	98,519	1.184	95,655	1.150	Coarse Aggregates	281,633	3.145	Coarse Aggregates	321,221	3.861
Fine Aggregates	12,088	0.384	3,792	0.120	Fine Aggregates	18,881	0.600	Fine Aggregates	29,271	0.930
	112,599	1.617	100,647	1.300	Aggregates	283,998	3.830	Aggregates	352,707	4.845

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