# 2021 1st Quarter Report

Report 2021
North Troy Quarry
Mill Creek, OK
Vulcan Materials Company

## VMC North Troy 2021 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-20 | 406.35 | 9.90 | 396.45 | 73.22 | 335.52 | 0.00 | 3.77 | 0.00 | 0.00 | 219.50 |
| February-20 | 470.74 | 5.00 | 465.75 | 103.24 | 370.99 | 0.00 | 2.32 | 0.00 | 0.00 | 219.50 |
| March-20 | 604.39 | 21.44 | 582.95 | 146.69 | 460.21 | 0.00 | 4.71 | 0.00 | 0.00 | 219.50 |
| 1st QTR Totals | 1481.48 | 36.34 | 1445.14 | 323.15 | 1166.72 | 0.00 | 10.79 | 0.00 | 0.00 | N/A |
| April-20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 219.50 |
| May-20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 219.50 |
| June-20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 219.50 |
| 2nd QTR Totals | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | N/A |
| July-20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 219.50 |
| August-20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 219.50 |
| September-20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 219.50 |
| 3rd QTR Totals | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | N/A |
| October-20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 219.50 |
| November-20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 219.50 |
| December-20 | 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 |
| 2020 Totals | 1481.48 | 36.34 | 1445.14 | 323.15 | 1166.72 | 0.00 | 10.79 | 0.00 | 0.00 | 219.50 |
| 2020 Total (adj) | 1481.48 | 36.34 | 1445.14 | 323.15 | 1166.72 | 0.00 | 10.79 | 0.00 | 0.00 | 219.50 |

1st Qtr notes — Production well electric issue - unable pump / no sample
New pond - transducer offline

2nd Qtr notes
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 2021 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 2021 | No water Pumped to Mill creek | | | | | 0.00 | | | | | | |
| February 2021 | No water Pumped to Mill creek | | | | | 0.00 | | | | | | |
| March 2021 | No water Pumped to Mill creek | | | | | 0.00 | | | | | | |
| April 2021 | | | | | | | | | | | | |
| May 2021 | | | | | | | | | | | | |
| June 2021 | | | | | | | | | | | | |
| July 2021 | | | | | | | | | | | | |
| August 2021 | | | | | | | | | | | | |
| September 2021 | | | | | | | | | | | | |
| October 2021 | | | | | | | | | | | | |
| November 2021 | | | | | | | | | | | | |
| December 2021 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | 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

**January 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 | Composite RCN |
| CN (pit) | 100 | area with direct interception | |
| S (pit fringe) | 1.363636364 | area draining into pit | |
| S (pit) | 0 | area with direct interception | |
| Pit - Direct Interception (>95 ft deep) | 111.00 | subject to refinement | ** |
| Pit fringe (area drains to pit) | 77.00 | subject to refinement | ** |
| Drainage to Pit (total area) | 188.00 | subject to refinement | |

| Date | Precip, in. | Quarry area Runoff, in. | Fringe area Runoff, in. | Daily Evaporation, in. | |
|---|---|---|---|---|---|
| 1-Jan | 0.58 | 0.58 | 0.00 | 0.03 | Runoff formula |
| 2-Jan | 0.42 | 0.42 | 0.00 | 0.05 | Pe = (P-0.2S)^2/(P+0.8S) |
| 3-Jan | 0.03 | 0.03 | 0.00 | 0.07 | S = (1000/CN)-10 |
| 4-Jan | 0.00 | 0.00 | 0.00 | 0.08 | |
| 5-Jan | 0.01 | 0.01 | 0.00 | 0.1 | Blue cells contain formulas |
| 6-Jan | 0.00 | 0.00 | 0.00 | 0.06 | |
| 7-Jan | 0.00 | 0.00 | 0.00 | 0.04 | |
| 8-Jan | 0.00 | 0.00 | 0.00 | 0.03 | |
| 9-Jan | 0.00 | 0.00 | 0.00 | 0.03 | |
| 10-Jan | 0.00 | 0.00 | 0.00 | 0.04 | |
| 11-Jan | 0.00 | 0.00 | 0.00 | 0.06 | |
| 12-Jan | 0.01 | 0.01 | 0.00 | 0.05 | |
| 13-Jan | 0.00 | 0.00 | 0.00 | 0.09 | |
| 14-Jan | 0.00 | 0.00 | 0.00 | 0.14 | |
| 15-Jan | 0.00 | 0.00 | 0.00 | 0.15 | |
| 16-Jan | 0.00 | 0.00 | 0.00 | 0.08 | |
| 17-Jan | 0.00 | 0.00 | 0.00 | 0.1 | |
| 18-Jan | 0.00 | 0.00 | 0.00 | 0.12 | |
| 19-Jan | 0.00 | 0.00 | 0.00 | 0.14 | |
| 20-Jan | 0.00 | 0.00 | 0.00 | 0.03 | |
| 21-Jan | 0.00 | 0.00 | 0.00 | 0.03 | |
| 22-Jan | 0.00 | 0.00 | 0.00 | 0.1 | |
| 23-Jan | 0.01 | 0.01 | 0.00 | 0.06 | |
| 24-Jan | 0.00 | 0.00 | 0.00 | 0.07 | |
| 25-Jan | 0.00 | 0.00 | 0.00 | 0.08 | |
| 26-Jan | 0.00 | 0.00 | 0.00 | 0.06 | |
| 27-Jan | 0.00 | 0.00 | 0.00 | 0.06 | |
| 28-Jan | 0.00 | 0.00 | 0.00 | 0.06 | |
| 29-Jan | 0.00 | 0.00 | 0.00 | 0.13 | |
| 30-Jan | 0.01 | 0.01 | 0.00 | 0.2 | |
| 31-Jan | 0.00 | 0.00 | 0.00 | 0.1 | |
| sum | 1.07 | 1.07 | 0.00 | 2.44 | |
| Volume, ac-ft | | 9.90 | 0.00 | | |
| Total Vol, ac-ft | | 9.90 | | Pan Evaporation from Sulphur Mesonet | |

**February 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) | 1.36363636 | area draining into pit | |
| S (pit) | 0 | area with direct interception | |
| Pit - Direct Interception (>95 ft deep) | 111.00 | subject to refinement | |
| Pit fringe (area drains to pit) | 77.00 | subject to refinement | |
| Drainage to Pit (total area) | 188.00 | subject to refinement | |

| Date | Precip, in. | Quarry area Runoff, in. | Fringe area Runoff, in. | Daily vaporation, in. | |
|---|---|---|---|---|---|
| 1-Feb | 0.01 | 0.01 | 0.00 | 0.08 | Runoff formula |
| 2-Feb | 0.00 | 0.00 | 0.00 | 0.08 | Pe = (P-0.2S)^2/(P+0.8S) |
| 3-Feb | 0.00 | 0.00 | 0.00 | 0.12 | S = (1000/CN)-10 |
| 4-Feb | 0.00 | 0.00 | 0.00 | 0.19 | |
| 5-Feb | 0.00 | 0.00 | 0.00 | 0.11 | Blue cells contain formulas |
| 6-Feb | 0.34 | 0.34 | 0.00 | 0.09 | |
| 7-Feb | 0.00 | 0.00 | 0.00 | 0.04 | |
| 8-Feb | 0.07 | 0.07 | 0.00 | 0.04 | |
| 9-Feb | 0.00 | 0.00 | 0.00 | 0.01 | |
| 10-Feb | 0.00 | 0.00 | 0.00 | 0.02 | |
| 11-Feb | 0.00 | 0.00 | 0.00 | 0.02 | |
| 12-Feb | 0.00 | 0.00 | 0.00 | 0.02 | |
| 13-Feb | 0.00 | 0.00 | 0.00 | 0.05 | |
| 14-Feb | 0.00 | 0.00 | 0.00 | 0.03 | |
| 15-Feb | 0.00 | 0.00 | 0.00 | 0.01 | |
| 16-Feb | 0.00 | 0.00 | 0.00 | 0.01 | |
| 17-Feb | 0.00 | 0.00 | 0.00 | 0.03 | |
| 18-Feb | 0.04 | 0.04 | 0.00 | 0.04 | |
| 19-Feb | 0.01 | 0.01 | 0.00 | 0.05 | |
| 20-Feb | 0.00 | 0.00 | 0.00 | 0.1 | |
| 21-Feb | 0.00 | 0.00 | 0.00 | 0.13 | |
| 22-Feb | 0.00 | 0.00 | 0.00 | 0.15 | |
| 23-Feb | 0.00 | 0.00 | 0.00 | 0.25 | |
| 24-Feb | 0.00 | 0.00 | 0.00 | 0.23 | |
| 25-Feb | 0.01 | 0.01 | 0.00 | 0.1 | |
| 26-Feb | 0.01 | 0.01 | 0.00 | 0.04 | |
| 27-Feb | 0.01 | 0.01 | 0.00 | 0.03 | |
| 28-Feb | 0.04 | 0.04 | 0.00 | 0.1 | |
| | | 0.00 | 0.00 | | |
| | | 0.00 | 0.00 | | |
| | | 0.00 | 0.00 | | |
| sum | 0.54 | 0.54 | 0.00 | 2.17 | |
| Volume, ac-ft | | 5.00 | 0.00 | | |
| Total Vol, ac-ft | | 5.00 | | Pan Evaporation from Sulphur Mesonet | |

**March 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) | 1.363636364 | area draining into pit |
| S (pit) | 0 | area with direct interception |
| Pit - Direct Interception (>95 ft deep) | 111.00 | subject to refinement |
| Pit fringe (area drains to pit) | 77.00 | subject to refinement |
| Drainage to Pit (total area) | 188.00 | subject to refinement |

| Date | Precip, in. | Quarry area Runoff, in. | Fringe area Runoff, in. | Daily Evaporation, in. |
|---|---|---|---|---|
| 1-Mar | 0.00 | 0.00 | 0.00 | 0.22 |
| 2-Mar | 0.00 | 0.00 | 0.00 | 0.12 |
| 3-Mar | 0.00 | 0.00 | 0.00 | 0.19 |
| 4-Mar | 0.01 | 0.01 | 0.00 | 0.26 |
| 5-Mar | 0.00 | 0.00 | 0.00 | 0.1 |
| 6-Mar | 0.00 | 0.00 | 0.00 | 0.14 |
| 7-Mar | 0.00 | 0.00 | 0.00 | 0.2 |
| 8-Mar | 0.00 | 0.00 | 0.00 | 0.26 |
| 9-Mar | 0.00 | 0.00 | 0.00 | 0.23 |
| 10-Mar | 0.00 | 0.00 | 0.00 | 0.26 |
| 11-Mar | 0.00 | 0.00 | 0.00 | 0.16 |
| 12-Mar | 0.01 | 0.01 | 0.00 | 0.08 |
| 13-Mar | 0.00 | 0.00 | 0.00 | 0.17 |
| 14-Mar | 0.00 | 0.00 | 0.00 | 0.2 |
| 15-Mar | 0.00 | 0.00 | 0.00 | 0.25 |
| 16-Mar | 0.00 | 0.00 | 0.00 | 0.21 |
| 17-Mar | 0.00 | 0.00 | 0.00 | 0.24 |
| 18-Mar | 0.00 | 0.00 | 0.00 | 0.19 |
| 19-Mar | 0.00 | 0.00 | 0.00 | 0.18 |
| 20-Mar | 0.00 | 0.00 | 0.00 | 0.21 |
| 21-Mar | 0.00 | 0.00 | 0.00 | 0.25 |
| 22-Mar | 1.76 | 1.76 | 0.78 | 0.07 |
| 23-Mar | 0.00 | 0.00 | 0.00 | 0.22 |
| 24-Mar | 0.00 | 0.00 | 0.00 | 0.13 |
| 25-Mar | 0.00 | 0.00 | 0.00 | 0.13 |
| 26-Mar | 0.00 | 0.00 | 0.00 | 0.28 |
| 27-Mar | 0.00 | 0.00 | 0.00 | 0.24 |
| 28-Mar | 0.00 | 0.00 | 0.00 | 0.22 |
| 29-Mar | 0.00 | 0.00 | 0.00 | 0.36 |
| 30-Mar | 0.00 | 0.00 | 0.00 | 0.3 |
| 31-Mar | 0.00 | 0.00 | 0.00 | 0.37 |
| sum | 1.78 | 1.78 | 0.78 | 6.44 |
| Volume, ac-ft | | 16.47 | 4.98 | |
| Total Vol, ac-ft | | 21.44 | | |

Runoff formula
Pe = (P-0.2S)^2/(P+0.8S)
S = (1000/CN)-10

Blue cells co

Pan Evaporation from Sulphur Mesonet

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-20 | 406.35 | 9.90 | 0.00 | 73.22 | 333.13 | 0.00 | 0.35 | 3.12 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| February-20 | 470.74 | 5.00 | 0.00 | 103.24 | 367.50 | 0.00 | 0.31 | 1.04 | 0.97 | 0.00 | 0.00 | 0.00 | 0.00 |
| March-20 | 604.39 | 21.44 | 0.00 | 146.69 | 457.69 | 0.00 | 0.91 | 2.95 | 0.84 | 0.00 | 0.00 | 0.00 | 0.00 |
| April-20 | | 0.00 | | | | 0.00 | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| May-20 | | 0.00 | | | | 0.00 | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| June-20 | | 0.00 | | | | 0.00 | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| July-20 | | 0.00 | | | | 0.00 | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| August-20 | | 0.00 | | | | 0.00 | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| September-20 | | 0.00 | | | | 0.00 | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| October-20 | | 0.00 | | | | 0.00 | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| November-20 | | 0.00 | | | | 0.00 | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| December-20 | | 0.00 | | | | 0.00 | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |

Settling Cell Evaporation and Infiltration

| | FO2 East | | | | | | FO2 West | | | | | | FO3/FO4 South Settling Cell | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Width, Ft | Length, Ft | Evaporation, ac-ft | Number of Production Days | Infiltration Rate, Ac-ft/day | Total Infiltration, Ac-ft | Width, Ft | Length, Ft | Evaporation, ac-ft | Number of Production Days | Infiltration Rate, Ac-ft/day | Total Infiltration, Ac-ft | Width, Ft | Length, Ft | Evaporation, ac-ft | Number of Production Days | Infiltration Rate, Ac-ft/day | Total Infiltration, Ac-ft | Total Evaporation, ac-ft | Total Infiltration, ac-ft |
| January-20 | 50 | 330 | 0.08 | 22.00 | 0.08 | 1.80 | 50 | 350 | 0.00 | 0.00 | 0.22 | 0.00 | 200 | 435 | 0.41 | 22.00 | 0.03 | 0.59 | 0.48 | 2.39 |
| February-20 | 50 | 330 | 0.00 | 0.00 | 0.08 | 0.00 | 50 | 350 | 0.07 | 14.00 | 0.22 | 3.12 | 200 | 435 | 0.36 | 14.00 | 0.03 | 0.37 | 0.43 | 3.49 |
| March-20 | 50 | 330 | 0.20 | 23.00 | 0.08 | 1.88 | 50 | 350 | 0.00 | 0.00 | 0.22 | 0.00 | 200 | 435 | 1.07 | 24.00 | 0.03 | 0.64 | 1.28 | 2.52 |
| April-20 | 50 | 330 | 0.00 | | 0.08 | 0.00 | 50 | 350 | 0.00 | | 0.22 | 0.00 | 200 | 435 | 0.00 | | 0.03 | 0.00 | 0.00 | 0.00 |
| May-20 | 50 | 330 | 0.00 | | 0.08 | 0.00 | 50 | 350 | 0.00 | | 0.22 | 0.00 | 200 | 435 | 0.00 | | 0.03 | 0.00 | 0.00 | 0.00 |
| June-20 | 50 | 330 | 0.00 | | 0.08 | 0.00 | 50 | 350 | 0.00 | | 0.22 | 0.00 | 200 | 435 | 0.00 | | 0.03 | 0.00 | 0.00 | 0.00 |
| July-20 | 50 | 330 | 0.00 | | 0.08 | 0.00 | 50 | 350 | 0.00 | | 0.22 | 0.00 | 200 | 435 | 0.00 | | 0.03 | 0.00 | 0.00 | 0.00 |
| August-20 | 50 | 330 | 0.00 | | 0.08 | 0.00 | 50 | 350 | 0.00 | | 0.22 | 0.00 | 200 | 435 | 0.00 | | 0.03 | 0.00 | 0.00 | 0.00 |
| September-20 | 50 | 330 | 0.00 | | 0.08 | 0.00 | 50 | 350 | 0.00 | | 0.22 | 0.00 | 200 | 435 | 0.00 | | 0.03 | 0.00 | 0.00 | 0.00 |
| October-20 | 50 | 330 | 0.00 | | 0.08 | 0.00 | 50 | 350 | 0.00 | | 0.22 | 0.00 | 200 | 435 | 0.00 | | 0.03 | 0.00 | 0.00 | 0.00 |
| November-20 | 50 | 330 | 0.00 | | 0.08 | 0.00 | 50 | 350 | 0.00 | | 0.22 | 0.00 | 200 | 435 | 0.00 | | 0.03 | 0.00 | 0.00 | 0.00 |
| December-20 | 50 | 330 | 0.00 | | 0.08 | 0.00 | 50 | 350 | 0.00 | | 0.22 | 0.00 | 200 | 435 | 0.00 | | 0.03 | 0.00 | 0.00 | 0.00 |

| January Shipments | | | February Shipments | | | March Shipments | | |
|---|---|---|---|---|---|---|---|---|
| | Tons Shipped | Ac-ft of water shipped | | Tons Shipped | Ac-ft of water shipped | | Tons Shipped | Ac-ft of water shipped |
| Base Products | 2,938 | 0.072 | Base Products | 1,517 | 0.037 | Base Products | 7,080 | 0.173 |
| Coarse Aggregates | 225,999 | 2.716 | Coarse Aggregates | 81,892 | 0.984 | Coarse Aggregates | 200,400 | 2.409 |
| Fine Aggregates | 10,600 | 0.337 | Fine Aggregates | 606 | 0.019 | Fine Aggregates | 11,672 | 0.371 |
| | 239,537 | 3.125 | | 84,015 | 1.041 | | 219,152 | 2.953 |