

**\*\*\*\*\* LIQUID SPILLS - VOLUME CALCULATIONS \*\*\*\*\***

Location of spill: COG - McIntyre A West 16

Date of Spill: 3-Dec-2018

If the leak/spill is associated with production equipment, i.e. - wellhead, stuffing box, flowline, tank battery, production vessel, transfer pump, or storage tank place an "X" here: ☒

**Input Data:**

If spill volumes from measurement, i.e. metering, tank volumes, etc. are known enter the volumes here: OIL: 0.0 BBL WATER: 0.0 BBL

If "known" spill volumes are given, input data for the following "Area Calculations" is optional. The above will override the calculated volumes.

| Total Area Calculations |       |        |   |                |         | Standing Liquid Calculations |       |        |              |         |    |
|-------------------------|-------|--------|---|----------------|---------|------------------------------|-------|--------|--------------|---------|----|
| Total Surface Area      | width | length |   | wet soil depth | oil (%) | Standing Liquid Area         | width | length | liquid depth | oil (%) |    |
| Rectangle Area #1       | 60 ft | 55 ft  | X | 0.75 in        | 100.0%  | Rectangle Area #1            | 0 ft  | X      | 0 ft         | 0.00 in | 0% |
| Rectangle Area #2       | 0 ft  | X      | X | 0.00 in        | 0%      | Rectangle Area #2            | 0 ft  | X      | 0 ft         | 0 in    | 0% |
| Rectangle Area #3       | 0 ft  | X      | X | 0.0 in         | 0%      | Rectangle Area #3            | 0 ft  | X      | 0 ft         | 0 in    | 0% |
| Rectangle Area #4       | 0 ft  | X      | X | 0.0 in         | 0%      | Rectangle Area #4            | 0 ft  | X      | 0 ft         | 0 in    | 0% |
| Rectangle Area #5       | 0 ft  | X      | X | 0.0 in         | 0%      | Rectangle Area #5            | 0 ft  | X      | 0 ft         | 0 in    | 0% |
| Rectangle Area #6       | 0 ft  | X      | X | 0 in           | 0%      | Rectangle Area #6            | 0 ft  | X      | 0 ft         | 0 in    | 0% |
| Rectangle Area #7       | 0 ft  | X      | X | 0 in           | 0%      | Rectangle Area #7            | 0 ft  | X      | 0 ft         | 0 in    | 0% |
| Rectangle Area #8       | 0 ft  | X      | X | 0 in           | 0%      | Rectangle Area #8            | 0 ft  | X      | 0 ft         | 0 in    | 0% |

**0.1**

**production system leak - DAILY PRODUCTION DATA REQUIRED**

Average Daily Production: Oil 0 BBL Water 0 BBL 0 Gas (MCFD)

Total Hydrocarbon Content in gas: 0% (percentage)

Did leak occur before the separator?: ☒ YES ☒ N/A (place an "X")

H2S Content in Produced Gas: 0 PPM

H2S Content in Tank Vapors: 0 PPM

Amount of Free Liquid Recovered: 0 BBL okay

Percentage of Oil in Free Liquid Recovered: 0% (percentage)

Liquid holding factor \*: 0.14 gal per gal

Use the following when the spill wets the grains of the soil.

\* Sand = **0.08** gallon (gal.) liquid per gal. volume of soil.  
 \* Gravelly (caliche) loam = **0.14** gal. liquid per gal. volume of soil.  
 \* Sandy clay loam soil = **0.14** gal liquid per gal. volume of soil.  
 \* Clay loam = **0.16** gal. liquid per gal. volume of soil.

Use the following when the liquid completely fills the pore space of the soil:

Occurs when the spill soaked soil is contained by barriers, natural (or not).  
 \* Clay loam = **0.20** gal. liquid per gal. volume of soil.  
 \* Gravelly (caliche) loam = **0.25** gal. liquid per gal. volume of soil.  
 \* Sandy loam = **0.5** gal. liquid per gal. volume of soil.

Total Solid/Liquid Volume: **3,300** sq. ft. **cu. ft.** **206** cu. ft. Total Free Liquid Volume: **sq. ft.** **cu. ft.** **cu. ft.**

**Estimated Volumes Spilled**

|                 |                |                |
|-----------------|----------------|----------------|
|                 | <b>H2O</b>     | <b>OIL</b>     |
| Liquid in Soil: | <u>0.0</u> BBL | <u>5.1</u> BBL |
| Free Liquid:    | <u>0.0</u> BBL | <u>0.0</u> BBL |
| Totals:         | <u>0.0</u> BBL | <u>5.1</u> BBL |

**Estimated Production Volumes Lost**

|                               |                |                |
|-------------------------------|----------------|----------------|
|                               | <b>H2O</b>     | <b>OIL</b>     |
| Estimated Production Spilled: | <u>0.0</u> BBL | <u>0.0</u> BBL |

**Estimated Surface Damage**

Surface Area: 3,300 sq. ft.  
 Surface Area: .0758 acre

**Recovered Volumes**

Estimated oil recovered: **BBL** check - okay  
 Estimated water recovered: **BBL** check - okay

**Estimated Weights, and Volumes**

Saturated Soil = 23,100 lbs 206 cu. ft. 8 cu. yds.  
 Total Liquid = 5 BBL 216 gallon 1,797 lbs

**Air Emission from flowline leaks:**

Volume of oil spill: - BBL  
 Separator gas calculated: - MCF  
 Separator gas released: - MCF  
 Gas released from oil: - lb  
 H2S released: - lb  
 Total HC gas released: - lb  
 Total HC gas released: - MCF

**Air Emission of Reporting Requirements:**

|                            |                   |              |
|----------------------------|-------------------|--------------|
|                            | <u>New Mexico</u> | <u>Texas</u> |
| HC gas release reportable? | <b>NO</b>         | <b>NO</b>    |
| H2S release reportable?    | <b>NO</b>         | <b>NO</b>    |