

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

Location of spill: COG - Copperhead 31 Fed 1H Battery

Date of Spill: 21-Oct-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		oil (%)	Standing Liquid Area		width	length	liquid depth	oil (%)	
				depth									
Rectangle Area #1	100 ft		20 ft	X	2.0 in	0%	Rectangle Area #1	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #2	0 ft	X	0 ft	X	0.00 in	0%	Rectangle Area #2	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #3	0 ft	X	0 ft	X	0.0 in	0%	Rectangle Area #3	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #4	0 ft	X	0 ft	X	0.0 in	0%	Rectangle Area #4	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #5	0 ft	X	0 ft	X	0.0 in	0%	Rectangle Area #5	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #6	0 ft	X	0 ft	X	0 in	0%	Rectangle Area #6	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #7	0 ft	X	0 ft	X	0 in	0%	Rectangle Area #7	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #8	0 ft	X	0 ft	X	0 in	0%	Rectangle Area #8	0 ft	X	0 ft	X	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: **2,000** sq. ft. **333** cu. ft. **cu. ft.** Total Free Liquid Volume: **sq. ft.** **cu. ft.** **cu. ft.**

Estimated Volumes Spilled

	H2O	OIL
Liquid in Soil:	<u>8.3</u> BBL	<u>0.0</u> BBL
Free Liquid:	<u>0.0</u> BBL	<u>0.0</u> BBL
Totals:	<u>8.3</u> BBL	<u>0.0</u> BBL

Total Liquid Spill Liquid: **8.3** BBL **0.0** BBL

Recovered Volumes

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

Estimated Production Volumes Lost

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

Estimated Surface Damage

Surface Area: 2,000 sq. ft.
 Surface Area: .0459 acre

Estimated Weights, and Volumes

Saturated Soil = **37,333** lbs **333** cu. ft. **12** cu. yds.
 Total Liquid = **8** BBL **349** gallon **2,904** 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?	NO	NO
H2S release reportable?	NO	NO