

10/13/2017

Subject: Remediation Update/Plan

****This location was under Encana Oil and Gas during the initial Remediation and now needs to be transferred to Utah Gas Corp. (Operator ID 10539)**

B12 6104 Young Cattle – Tank Release/Pit Investigation and Remediation System (Rem: 9341)

COGCC Location ID: 322420

NWNE, Sec. 12, T6S, R104W, 6th PM

Garfield County, Colorado

Attn: Carlos Lujan

Background

- 2015: During routine inspections, a tank on location lost ~200bbl into an unlined secondary containment. The free fluid was removed; however, the absence of a liner allowed vertical mobilization. During due diligence, it was discovered that the pit on location had never been closed. The pit was investigated also when the drill rig was scheduled to delineate the area.
- 07/14 – 18, 2015: Thirteen (13) soil borings were advanced ranging from 42' to 75' below ground surface. Five (5) borings were converted into soil vapor extraction (SVE) wells, four (4) being with the pit boundary. TPH ranging from 2,900 – 7,800 mg/kg and Benzene 0.34 – 1.4 mg/kg on the highest impacts.
- 3rd Quarter 2016: SVE pilot trailer testing.
- 4th Quarter 2016: Active SVE trailer installed. (Removed Q1 2017 after acquisition)
- July 2017: New active SVE trailer installed.

SVE pilot trailer data

In 2016, before the sales acquisition; Encana incorporated the use of an SVE pilot trailer to determine air flow in cubic feet per second, and vacuum pressures at which the air flow occurs. PID readings are collected to observe available hydrocarbon changes over time to help determine when additional drilling needs to occur to obtain site closure. This analysis demonstrates air movement occurring within the subsoils at the screened interval allowing for subsurface air exchange to occur. The continuous air exchange via the bio-vent wells allows for naturally occurring bacteria to consume the TPH (GRO/DRO ranges). The following table demonstrates data obtained with the use of the SVE pilot trailer in 2016:

B12 Well Pad	Q3 2016	Well	Start Time	SCFM	Vacuum (inches of Hg)	Temp (F°)	PID (ppm)
		SVEN02	14:15	110	12	70	2279
		SVEN01	14:12	110	12	70	1969
		SVES01	14:00	65	12	70	1916
		SVES02	13:35	70	12	70	200
		SVEW01	13:10	65	12	68	380

Q4 2016 – Q3 2017

Encana incorporated a solar Active SVE Trailer to intermittently run during daytime hours. The vacuum blower was connected to 2 bio-vents wells. PID readings were collected periodically to determine the effectiveness of the system. During the first run of the active SVE trailer; vacuum was able to collect/recover ~ 3oz of free product (Encana's trailer only ran for a total amount of 24 hours). The trailer that was in place had difficulties running through the winter months due to snow cover and available sunlight (the trailer was removed in late winter before Utah Gas acquired Encana). The new SVE trailer that Utah Gas Corp was installed and actively running in late summer. Active vacuum has been running for 3 months and has recovered ~ 1oz of free product. The following table demonstrates data obtained with the use of the Active SVE Trailer:

B12 Well Pad	Date	Hour Meter	Well: SVEN02 (Inches of Water)	Well: SVES01 (Inches of Water)	PID (ppm)	Free product Recovered (oz)
	7/27/17	24	*Unknown	*Unknown	2424	0
	09/08/17	152	*Unknown	*Unknown	2047	0
	09/20/17	190	*Unknown	*Unknown	1856	0
	10/4/17	290.1	*Unknown	*Unknown	1840	1

*Unknown – incorrect valve on vacuum. Replaced next field sampling round.

Approach

Based on the 2015 sampling data, allowable air movement at the location, impact depths, and the elevated PID readings, it has been determined that for 2018 the B12 will continue to have the Active SVE Trailer vacuum blower installed. The trailer is going to be rotated between two locations that are within close proximity (DPU 7712 Location ID: 322452 / REM# 5274 [see attached map for reference]). PID readings will be collected periodically throughout the year to determine the effectiveness of the trailer. When PID readings fall below 500ppm at the exhaust of the SVE system the location a Form 27 will be submitted and drilling will be scheduled to collect samples. If the active system proves to be ineffective at this location, an alternative remediation approach will be evaluated and proposed to the COGCC for approval.

If you have any questions pertaining to this project, please do not hesitate to contact me at (970) 901-9007 or mattkasten@dirtyco.info.

Attachments

- Site diagram

Regards,
Matt Kasten
Dirtyco
EHS Manager