RE: Report of Work Completed – Excavation Oversight and Sampling
H2-797 well pad (COGCC Location ID # 439917)
Tract 66, Section 2, T7S, R97W, 6th PM (Lat = 39.475669, Long = -108.180217)
Garfield County, Colorado

Background

Based on records acquired from the Colorado Oil & Gas Conservation Commission (COGCC) and provided by Caerus, the flowline release (COGCC Spill/Release Point ID # 452867) occurred on the H2-797 well pad (COGCC Location ID # 439917). Initial Form 19 documentation identified by COGCC Document ID 40144768 was submitted as formal notification.

Per COGCC general comments in the Initial Form 19, Caerus was required to determine the extent of contamination and ensure remediation to Table 910-1 standards.

Approach

On October 31st, November 1st, and November 9th, 2017 field personnel provided oversight for excavation activities conducted along the flowline route between the well heads and the separators. Excavation of the flowline area identified the flowlines were placed on top of a competent sandstone bedrock. The sandstone bedrock was inspected with shovels to identify any cracks to allow for fluid migration. No cracks were identified during the process and weaknesses in the competency of the sandstone were not identified within the area. The identification of these two features created a scenario where the fluid released from the leaking flowline saturated the soil within the immediate area of the flowline and was not allowed to migrate a large distance.

Field assessment of the excavation was conducted using visual observation and a 10.2 eV photo-ionizing detector. Once field assessment activities confirmed removal of the impacted soil, confirmation soil samples were collected from the four walls and bottom of the excavation to determine if the extent of contamination was reached. Sample locations are depicted on the attached figure. All soil samples were placed into clean, laboratory provided containers and shipped under chain-of-custody procedures via FedEx to ALS Environmental located in Holland, Michigan. The soil samples were analyzed for COGCC Table 910-1 analytes. Table 1 summarizes the analytical results of these samples and the laboratory report is attached.

During the initial assessment of the spill, no expressions of groundwater or surface water were identified in the immediate area of the well pad.

All soil removed from the excavation was staged on the well pad location for field assessment and sample collection. Soil samples have been collected from the staged spoil pile but have not been received. Once received, Caerus will provide the laboratory analytical results of the spoils pile sampling under COGCC Form 4 cover to include final disposition or remediation activities to be completed.

Findings

Six soil samples were collected from the excavation to define the extent of contamination. Four sidewall samples demonstrate compliance with COGCC standards while the bottom sample exceeds COGCC standards, please see attached Table 1.

Conclusions

During construction of the well pad, chisel activities were required to dig through competent sandstone bedrock to allow for burial of the flowlines at an acceptable depth. Following excavation, competent sandstone bedrock was identified below the leaking flowline which acted as a sealed bottom to not allow migration of the spilled fluids.

Based on excavation oversight, field assessment, and confirmation samples collected, Caerus has delineated and removed the extent of contamination feasible from the flowline spill area. The soil sample collected from the bottom of the excavation represents a small amount of impacted competent bedrock which is not feasible for removal. Based on the horizontal extent of contamination defined, and the competent bedrock defining the vertical extent of contamination, Caerus requested via email approval to backfill the existing excavation and received approval.

Based on the small amount of impacted bedrock left in the excavation, Caerus will continue to assess and sample available water sources within the immediate area of the well pad through the second quarter of 2018. Once sample results from any available water sources indicate no impacts to surface water, Caerus will submit a Form 27 to close the remediation project.