Responses to Conditions of Approval for COGCC Document #402512257

COA #1
Provide an explanation for discrepancies of the 8260 analysis from the 7/21/2020 sampling event to the 8/31/2020 sampling event.

Response:
The first sample was from the open borehole and the second sample was collected from the purged well. Some free product was removed from the well between the two samples which resulted in different concentrations of some parameters. The second sample included 8260 Appendix IX parameters and was collected as an internal sample to allow for comparison of the sample results to the samples of produced water collected semi-annually from the water management pit at the P-32 facility located on Old Mountain.

COA #2
On the chain of custody, please clarify that the constituents are that are listed after VOCs 8260 + ??Ix, and MEETAC. It is assumed that MEETAC is for the methanol and ethanol analysis.

Response:
Method 8260B contains a supplemental list of parameters that are run for air permitting purposes referred to as "Appendix IX". 8260 Appendix IX and MEETAC (methanol and ethanol) analyses were analyzed to compare the lab results from MW-1 to the produced water analyses collected at the water management pit at the P-32. This was an internal sample that was not required under the regulations that was shared with the COGCC.

COA #3
Field reconnaissance of the two (2) prominent drainages to the north-northwest and north-northeast shall be performed in addition to those that discharge into Ben Good Creek and the East Fork of Parachute Creek. Any springs or seeps observed shall be analyzed for Table 910-1, as well as constituents listed under Rule 609, EPA Method 8260, and 8270.

Response:
Field reconnaissance of the two drainages, in addition to the two drainages located south and southeast of the spill site, will be conducted during the spring of 2021. Samples will be collected of any springs or seeps encountered.

COA #4
Under the Remediation Progress Update Tab, the Report Type "Land Treatment Progress" is checked. The various attachments to this Supplemental F27 do not address any of the land farming activities. The operator shall provide a Supplemental F27 addressing the land farming activities to include the volume of material being land farmed, frequency of tilling or disking, amendments added (if any), frequency of sampling for Table 910-1 constituents, and analytical results to determine the effectiveness and progress of the land farming activities.

Response:
The material excavated from the spill location was derocked and placed in a landfarm cell on the J15 well pad surrounded by a soil berm. The material was tilled on several occasions during the summer and fall of 2020. A screening level composite sample was collected from the landfarm materials on November 18, 2020 and will be analyzed for Table 910-1 parameters to evaluate further treatment needs. Additional screening samples will be collected during the spring of 2021 and final sampling conducted according to the current landfarm sampling program when screening samples indicate that the material is likely to pass the standards.

COA #5
Under the Remediation Progress Update Tab, the COGCC has changed the reporting period frequency from quarterly to monthly. This will be re-evaluated upon full delineation of subsurface and groundwater impact.

Response:
The change in reporting frequency is noted. This Supplemental Form 27 provides the first monthly progress report. Delineation of the lateral and vertical extent of impacts was completed on November 18, 2020. The sample results are pending.

COA #6
Provide construction details and surveyed elevation of MW-1 in a Supplemental F27.

Response:
Monitoring well MW-1 was constructed using 4" PVC. Twenty feet of screen with 0.01" slots was installed from 40.0-60.0 feet. The filter pack consists of 10-20 silica sand from 30.0 feet to the total depth of 60.4 feet. Bentonite (3/8" chips) was placed above the filter pack to 2.0 feet depth. A concrete seal is present from ground surface to 2.0 feet. The elevation of the well is 8,365 feet amsl. A complete listing of the construction details, locations, and elevations for all monitoring wells installed at the site, as well as the boring logs, will be presented in the J15 Site Investigation Report.

COA #7
Groundwater samples from all monitoring well and surface water locations (springs, seeps, etc.) shall be analyzed for Table 910-1, as well as constituents listed under Rule 609, EPA method 8260, and 8270.

Response:
Three groundwater samples were collected from wells MW-1, MW-4, and MW-5 on November 18, 2020 and are currently being analyzed for the listed parameters. A sample could not be collected from new well MW-2, installed in the center of the excavation, because a layer of condensate was present on top of the fluid that prevented direct sampling of the fluid beneath the condensate. Newly installed wells MW-3, MW-6, and MW-7 are currently dry.

COA #8
Operator has implied remediation cleanup standards to Colorado Aquatic Life Standards. Remediation cleanup standards shall be those standards in Table 910-1.

Response:
The comparison of sample results to Colorado Aquatic Life Standards was done for information purposes only and was not meant to imply that these are applicable cleanup standards.

COA #9
Operator shall provide documentation in determining background concentrations for the inorganic constituents.

Response:
An analysis of background groundwater concentrations for inorganic parameters using previous sampling results from springs in the Long Ridge and Old Mountain areas will be provided in the J15 Site Investigation Report.

COA #10
The operator shall provide a time line of proposed remediation efforts as soon as practicable. The delineation of this release shall be completed prior to the end of the calendar year. Notify the COGCC 72-hours prior to the field work.

Response:
Drilling for the delineation of the lateral and vertical extent of impacts was completed on November 18, 2020. The analytical results are pending and will be presented in the J15 Site Investigation Report. Additional activities planned during 2020 include the installation of a more robust extraction system in wells MW-1, MW-2, MW-4, and MW-5; measurement of fluid and condensate levels in the four wells and the amounts of fluid extracted; and, gauging of the three dry wells (MW-3, MW-6, and MW-7) for the presence of water and sampling of these wells if sufficient water is present.

COA #11
Shallow suspect zone from initial boring shall be isolated to determine influence in at least one of the proposed monitoring wells.

Response:
Well MW-2 was installed near the center of the excavation with a screen interval that extends across the entire impacted interval from 20-60 feet bgs. The filter pack was placed from 14.0-60.0 feet to isolate the impacted zone from influence from water seeping from above. Drilling results indicate that a groundwater unit is not present beneath the site.

COA #12
Free product encountered in investigative borings shall be removed upon discovery.

Response:
Free product (condensate) was encountered in new wells MW-2 (more than 4 feet of thickness) and MW-4 (about ¼ inch thick). No condensate layer was observed in well MW-5. Condensate will be removed by the extraction system.

COA #13
Additional investigative borings shall be drilled to determine the lateral and vertical extent. Per Rule 909.b.2, samples shall be collected and analyzed to determine the horizontal and vertical extent of any contamination in excess of the concentrations in Table 910-1.

Response:
Six additional borings were drilled and completed as monitoring wells during the period November 16-18, 2020. Samples were collected from two new wells and existing well MW-1 to evaluate the nature of impacts. The sample results are pending and will be presented in the J15 Site Investigation Report. The drilling results indicate that the impacts are confined to the immediate vicinity of the spill location and have not migrated past the Long Ridge access road to the south or east. The results also indicate that a groundwater unit is not present beneath the site. The spilled fluids are contained within fractures in the Uinta Formation sandstones beneath the site to depth of about 40 feet bgs. These fractures become tighter and less transmissive with depth and trapped the fluids at this depth. No clay layers were encountered during drilling, and the underlying Green River Formation was not reached in any of the borings.

COA #14
It is stated, "Approximately 13 gallons are pumped from the well in a few minutes and then the well goes dry. This indicates that the water is contained only in fractures within the sandstone bedrock at the site and that only the sand pack around the well is saturated with water." Does this mean then that the MW is being recharged from the fractured sandstone bedrock?

Response:
The spilled fluid is contained only in the fractures within the bedrock to depths of about 40 feet bgs; the sandstone matrix is dry. The drilling results indicate that no groundwater unit is present, therefore, the use of the term “recharge” is not appropriate here. Limited infiltration of surface water from melting snow into the fractured bedrock likely occurs in the spring.