

October 11, 2012

John Axelson  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, CO 80203

**RE: Limited Subsurface Investigation: Three Historic Produced Water Pits, Terrace Gas Plant (COGCC Pit #100035 and 100036) and Kern 43-33 Battery (COGCC Pit #117951), Weld County, Whiting Oil and Gas Corporation**

Dear Mr. Axelson:

Olsson Associates (Olsson) performed a limited subsurface investigation of three historic unlined produced water pits in Weld County for Whiting Oil and Gas Corporation. Pit 1 is located at Terrace Gas Plant (Pit #100036), west of the intersection of Weld County Road (WCR) 118 and WCR-127. Pit 2 (Pit #100035) is located approximately 800 feet west of Pit 1, on the south side of WCR-118. The third pit, Pit 3 (Pit #117951), is located at the Kern 43-33 Battery (API 05-123-10268) approximately one mile southwest of the town of Hereford. Whiting proposes to replace these pits with an aboveground storage tank.

Olsson prepared the attached report that presents the findings of the limited subsurface investigation. Olsson proposes to excavate soils from each of the pits and land farm the impacted soils onsite. K&K Oilfield Services, Inc. will provide the necessary labor and equipment to excavate the impacted soil, constructed the landfarm cells, and till and fertilize the landfarm soil. Olsson will periodically sample the soils to demonstrate that they meet COGCC Table 910-1 concentration levels. An overview of the proposed plan for remediating these pits follows:

- The only area impacted at Pit 1 was beneath a discharge line into the pit where an elevated pH value was reported from the sample collected at a depth of 2.0 fbs. There was also some staining observed at depth. Olsson will collect a confirmation sample during excavation at Pit 1.
- Two tin horns (vertically buried culvert) adjacent to Pit 1 to the east will also be removed during excavation and confirmation samples will be collected at these locations.
- Pit 2 is located within the county Right of Way of WCR-118. Olsson proposes to remove the tin horn located within the pit and to excavate impacted soil to be land farmed at Terrace Gas Plant. We propose that soils excavated from the pit and the two tin horns will be land farmed onsite at Terrace Gas Plant.

Olsson contacted Mr. Jim Kerndt, Kerndt Brothers Savings in Iowa and Mr. Eugene Nelson with Nelson Ranches to request permission to landfarm the impacted soils on location. Olsson mailed letters each of these landowners, and followed up with telephone calls. Mr. Kerndt was in favor of remediating the impacted soils and closing the pit. Mr. Kerndt referred Olsson to Mr. Scott Tietmeyer, the local site manager, to schedule the work for the Kern well. Mr. Tietmeyer's only concerns were that we stay on the lease location and not impact the pasture adjacent to the lease, and notify him prior to initiating the work. Soil excavated from Pit 3 at the Kern 43-33 Battery will be land farmed in place within the pit on the Kern well location.

Mr. Nelson was also in favor of remediating the pits at the Terrace Gas Plant. He said that if we needed fill materials that there is a sand and gravel pit near the plant where we could obtain the material for fill and berm material.

Prior to excavation at these pits, any liquid within the tin horns, as well as sludge that remains in Pit 3, will be removed and disposed of offsite at the nearest disposal facility. K&K Oilfield Services will visit these sites periodically to turn the soil and add nutrients to accelerate the biodegradation process. For questions or comments, please contact me at 303-237-2072, or [jhix@olssonassociates.com](mailto:jhix@olssonassociates.com).

Sincerely,  
**Olsson Associates**



James W. Hix, P.G.  
Senior Geologist