

LINN Energy

Linn Operating, Inc.

Piceance Asset

Parachute, Colorado

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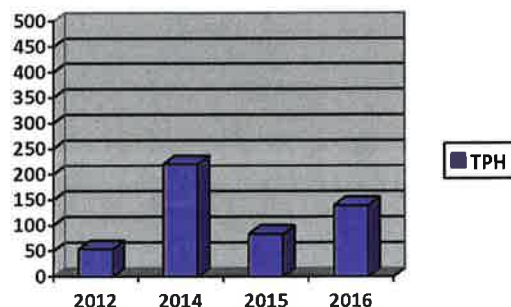
K15 696 Landfarming Plan – Land Application #443348

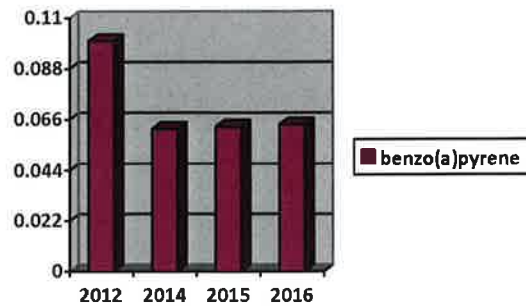
- History

- Five wells were drilled on this well pad in 2008. One well was plugged and abandoned. Four wells were completed and are currently producing. These wells were drilled with the use of diesel based drilling mud. Drill cuttings were blended with clean soil and stockpiled on location. Samples of these spoils have been taken annually (except 2013) beginning in 2012. Composite samples reported that TPH never exceeded COGCC Table 910-1, however, every sample reported that benzo(a)pyrene has exceeded the standards. Discrete samples taken from the pit bottom on July 11, 2015 passed all COGCC Table 910-1 standards. Backfilling the pit is pending the successful treatment of the spoil piles.

- Current Status

- Approximately 12,794 cubic yards of spoil material that is being treated on site by land farming is remnants from drilling and completion operations. The landfarming operations have taken place since the summer of 2011. Samples taken since September 26, 2012 indicate that this material fails COGCC Table 910-1 for benzo(a)pyrene at various levels (0.0639 – 0.10). The highest reading was taken on Oct. 8, 2016. The spoil material was spread out Sept. 12, 2016 and was treated three times in 2016: (May 25, July 28, & Sept. 15). TPH levels did not exceed the COGCC Table 910-1 standards at any time on this location.
- At the current time, this location has been tilled three times. Analysis of the pre-treatment samples recommended increasing the ammonia-phosphorus fertilizer at a slightly higher rate than previous rate and adding fulvic acid. A copy of the pre-treatment lab report is attached to the Form 27. The landfill spoils piles have been spread out even more on the site, but to achieve optimum exposure to sunlight and air, approximately 6,500 cubic yards will be moved to the L15 696 and spread out to approximately 12" – 16" high. The remaining 6,294 cubic yards will be spread out on the K15 696 pad to approximately 12" – 14" depth. A diagram of the L15 696 pad is attached to the Form 27.





- Treatment - 2017
 - Spoil will be turned over by an excavator or with a Kubota farm tractor with a chisel point plow 8 to 10 times (depending on weather and snow conditions) during the warm months in 2017. The soil will be turned over with the frequency established in the plan as a minimum or with a higher frequency if possible. The soil will be spread out to increase exposure to the atmosphere and sunlight as much as possible on the production pad.
 - Pre-treatment samples taken in the early spring will determine the amount of amendments that will be added to the spoil based on an analysis of nutrients present in the spoils.
 - Amendments.
 - Based on analysis, phosphorus fertilizer and fulvic acid will be added during each tilling operation to address benzo(a)pyrene.
- Samples and lab tests
 - Phase I - Composite sample will be taken from 8 locations on the spoil pile in early summer and analyzed.
 - If composite sample passes, discrete samples will be taken to confirm the composite samples.
 - If discrete samples pass, spoil will be buried per COGCC rules and interim reclamation of the pad will take place.
 - If discrete samples fail, landfarming will continue.
 - If composite sample fails, landfarming will continue.
 - Phase II - Composite sample will be taken from 8 locations on the spoil pile in late fall and analyzed.
 - Procedure will be the same as Phase I
- Continuation
 - Process will continue into 2018 until spoil passes COGCC Table 910-1, specifically the benzo(a)pyrene.