Kerr-McGee Oil & Gas Onshore LP

Odor Mitigation Plan

CAMENISCH 10-33HZ PAD - Well Pad and Facility

Section 33 T4N R67W, 6th P.M.
Weld County, Colorado

March 2022

Drilling Phase

1. List of potential sources of odors (prior to mitigation measures):
   a. Oil based drilling fluid is a potential source of odor. The following areas of the rig can be affected by oil-based drilling fluid odor if un-mitigated:
      i. Shaker area and cuttings transfer tank
      ii. Active and reserve oil-based mud tanks
      iii. Three- sided cuttings collection/storage tanks
      iv. Drilling tubulars racked in derrick
      v. Cuttings while in transport to landfill

2. Identification of drilling fluid planned:
   a. Hydrocarbon based drilling fluid at an approximate ratio of 70% hydrocarbon to 30% water.
   b. The 70% hydrocarbon portion of the drilling fluid will be comprised of a Group III non-aqueous fluid with low to negligible aromatic content. The PAH content of the Group III fluid will be less than 0.001% and contain no BTEX. The DrO product is a less volatile hydrocarbon which lowers total volatile organic compounds (VOCs).

3. List of odors reducing, or suppressive additives planned for use as part of normal operations:
   a. Group III drilling fluids are considered to have negligible odor and do not require any type of additional additive to suppress nuisance odors.
   b. In the unlikely event that nuisance odors do become a problem during active production drilling operations, KMOG will have a contingency water-soluble odor neutralizer with essential oils available to treat the drilling fluid system on an as needed basis.

4. Description of equipment and processes used to control odors for each source/activity:
   a. Utilizing a Group III base oil drilling fluid will be the primary defense against odor control
   b. The Group III drilling fluid eliminates odor in the following areas:
      i. Shaker area and cuttings transfer tank
      ii. Active and reserve oil-based mud tanks
      iii. Three-sided cuttings collection/storage tanks
      iv. Drilling tubulars racked in derrick
      v. Cuttings loads in transport to landfill
5. In addition to using Group III based oil, the following techniques are used to further ensure the elimination and/or reduction of odor:
   a. All cuttings on location are dried using centrifugal dryers to ensure only trace amounts of drilling fluid remain on the dry cuttings. This ensures odor is eliminated while waiting on transport and during transport to local landfills.
   b. Drill pipe and any other tubular pulled out of the hole are wiped down before being racked in the derrick or laid down on location.
   c. Base oil used to build new drilling fluid is transferred though a line outlet run to the bottom of the mix tank to minimize agitation (splashing) and reduce potential to create odor.
   d. During flowback and well completions, utilize closed-loop completion techniques to the maximum extent practicable to minimize emissions and the flaring of natural gas.

6. Description of how cuttings will be managed at location to include how odors will be managed during transport:
    a. All residual drilling fluid on cutting will be comprised of water and Group III base oil which is considered to have negligible odor.
    b. After passing over the shale shakers, cuttings are transported through a closed loop piping system to a centrifugal dryer which removes the majority of drilling fluid, leaving dry cuttings and the drilling fluid is then returned to the active pit system for reuse.
    c. Cuttings are transported to local landfills, generally, remaining on location less than 24 hours. The dried cuttings with only trace drilling fluid will not have an odor because of the use of Group III base oil.
    d. In the event odor did become noticeable on cuttings on location or during transport, an odor neutralizing agent will be available as a contingency to treat the residual fluid on cuttings, but only applied if necessary.

7. **Best Management Practices** used to manage odor from the location during the <u>drilling</u>:
    a. All oil based drilling fluids will be built using a Group III base oil with negligible aromatic content and PAH less than 0.001% so that it does not emit odor during all production drilling operations.
    b. The Group III base oil will be utilized in a closed loop drilling fluid system and eliminate odor at the shakers, transfer tank, active/reserve tanks, and cuttings in collection tanks and during transport.
    c. All drill cuttings are processed through centrifugal dryers to remove residual oil-based drilling fluid not removed by shale shakers.
    d. All tubulars pulled out of the hole will be wiped prior to being racked in the derrick or laid down.
    e. Cuttings storage time on location will be minimized prior to transport to local landfills.
    f. New drilling fluid will be built using transfer line outlets located below tank fluid level to minimize splashing/agitation. New fluid will only be built using Group III base oils.
    g. KMOG will use a mud chiller with the intent to lower the drilling fluid temperature as fluids are redeployed downhole. Mud chillers will be installed downstream of the shale shakers.

8. **Best Management Practices** used to manage odor from the location during <u>production</u>:
    a. KMOG uses pipelines to transport hydrocarbons (oil & gas) from the production facility eliminating odors that could occur during truck loading.
    b. Production facilities are inspected regularly by KMOG to make sure the equipment is working property and necessary maintenance is performed, to reduce potential odors. KMOG incorporates Audio, Visual, Olfactory (AVO) observations at production facility inspections.
    c. KMOG will use Best Management Practices to reduce unloading events and to reduce potential odor causing emissions when liquids unloading is necessary (i.e., maintenance activities to remove liquids from existing wells that are inhibiting production).
    d. KMOG remotely monitors production facilities, this reduces traffic onto production facilities which may create odors from truck traffic.