

Drill Cuttings Waste Management Plan

Best Management Practices for Effective Remediation of Drill Cuttings

Oil Based Mud Cuttings

- All oil based mud cuttings will be removed from the location and disposed of at a commercial disposal facility.

Water Based Mud Cuttings

1 Mixing

- All cuttings shall be mixed on location to ensure contact between the cuttings and the moisture control additives.
- Cuttings are combined with an appropriate mixture of amendments to ensure they will pass a paint filter test.

2 Stockpile Management

- Mixed cuttings shall be stored on location in stockpiles.
- Stockpiles shall be constructed as tall as practical in order to aid in the retention of warmth within the stockpile, thereby increasing microbial activity, if warranted.
- Leachate and storm water runoff shall be managed through the properties of the moisture content reducing amendment, which allows the stockpiles to be stacked on location.
- A small earthen berm or wattles shall be constructed around the stockpiles as a further countermeasure against storm water runoff. The well pad's storm water berm is also a viable option for containment.
- The stackable consistency and absorbent properties of the cuttings material will aid in protecting the native landscape from windborne contaminated particulate. Stockpile disturbance shall be minimized until soil sampling technicians visit the site.

3 Sampling and Testing

- The stockpile of treated cuttings will be sampled and tested according to standard protocol and COGCC Table 910-1. One (1) soil sample comprised of a 5-part composite will be collected per every 100 cubic yards of cuttings. Initial sampling will be performed upon the drilling completion of each well. The frequency of sampling thereafter will be monthly.
- A permanent record of the laboratory analyses shall be maintained by the Operator.

4 Treatment or Disposal

- If the cuttings have not achieved the COGCC Table 910-1 threshold limits before the time of interim reclamation, the cuttings will be either treated or disposed of as described below.
- Treatment of the cuttings will be based on laboratory analytical results and may consist of oxidation, mechanical shredding, blending, bioremediation, and/or aeration.
- If deemed necessary, cuttings may be transported and disposed of under an appropriate waste manifest at an approved landfill facility.

- Once the cuttings have achieved the COGCC Table 910-1 threshold limits for organic compounds, the treated material may be reused on site (earthen berms, pad stabilization/reclamation, sub-soil stockpile stabilization/reclamation, thin spread).
- At the time of final reclamation, confirmation soil sampling will be performed to ensure that inorganic compound concentrations of contaminants of concern do not exceed the levels in Table 910-1 or background concentrations after incorporation into the native soil.