

Exploration & Production Waste Management Plan  
Land Application & Incorporation of Water-Based Bentonitic Drilling Fluids  
& Associated Drill Cuttings  
Ward Petroleum (Sharp 24-3-11HC Well)

**Subject Property:**  
**COGCC Facility ID:**

SE ¼, SE ¼, Sec 36, T3N, R65W  
Weld County Road 49  
Weld County, Hudson, Colorado

This Exploration & Production (E&P) Waste Management Plan outlines the operational requirements for applying water-based bentonitic drilling fluids and associated drill cuttings to privately owned agricultural land to maintain compliance with COGCC Rule 907.d. (3). Only water-based bentonitic drilling fluids and associated drill cuttings generated by Ward Petroleum are covered by this plan. The drilling fluids and drill cuttings will be applied to the agricultural cropland as a beneficial soil amendment and as a conservation method to prevent soil erosion. A topographic map showing the site location is provided as Figure 1. An aerial photograph showing the location of the proposed land application site is provided as Figure 2. The E&P Waste Management Plan is outlined as follows:

1. Ward Petroleum will certify this plan by signing said plan and certifying compliance with the contents of this plan (Attachment A).
2. Ward Petroleum shall obtain written authorization from the surface owner prior to land application of the water-based bentonitic drilling fluids and associated drill cuttings (Attachment B).
3. The agreement certifies that only water-based bentonitic drilling fluids and associated drill cuttings will be applied at this site. No other E&P waste shall be deposited at this site.
4. Water based bentonitic fluids and associated drill cuttings will be applied and spread at a minimum distance of approximately 50 feet from each property boundary to provide an adequate buffer between the application site and surrounding properties.
5. A 3-inch maximum lift of water-based bentonitic drilling fluids and associated drill cuttings will be applied prior to incorporation. The waste shall be applied to prevent ponding or erosion.
6. Ward Petroleum personnel will ensure that the material is incorporated into the soil within 10 days (site and weather conditions permitting).
7. Ward Petroleum will maintain records of the following information:
  - Name of the well where material was generated
  - Date the material was transferred from the well to the land application site

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- Volume of the material taken to the land application site
- Name of the transporter

8. Soil sampling:

- Baseline soil samples will be collected and analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX), inorganic analyses including electrical conductivity (EC), sodium adsorption ratio (SAR), and pH, and analyses of COGCC Table 910-1 priority metals.
- If horizontal wells will be drilled, a horizontal drilling composite soil sample will be obtained to determine the presence/absence of petroleum hydrocarbons in soil from the horizontal portion of the well within the producing formation. The soil sample will be submitted to a contract laboratory to determine the presence/absence of BTEX and total petroleum hydrocarbons (TVPH + TEPH).
- Following incorporation of the drilling mud, representative soil sample(s) will be collected from an interval of 0-12 inches below ground surface (bgs). The number of samples collected will depend on the surface acreage used for incorporation.
- At a minimum, post incorporation soil samples will be analyzed for TEPH-TVPH, BTEX, EC, SAR, pH, and Table 910-1 priority metals to ensure compliance with COGCC Table 910-1.

9. Water-based bentonitic drilling fluids and associated drill cuttings will be applied at this site for a maximum of two years.

10. Upon closure of the site, Ward Petroleum will submit a Form 4 Sundry Notice providing final confirmation soil sample(s) data and request closure for this site.

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**ATTACHMENT A**  
**PLAN CERTIFICATION**

Management Approval Statement:

This Exploration & Production (E&P) Waste Management Plan is fully supported by the management of Ward Petroleum. Ward Petroleum is committed to the protection of surficial and subsurface environments, waters of the State, and public health, and maintains the highest standards for tracking drilling fluid applications, site subsurface monitoring, sampling and compliance with Colorado Oil and Gas Conservation Commission (COGCC) regulations. Ward Petroleum ensures that E&P waste is properly stored, handled, transported, treated, recycled or disposed of to prevent threatened or actual adverse environmental impacts to air, water, soil or biological resources or to the extent necessary to comply with the concentration levels outlined in COGCC Table 910-1.

Ward Petroleum will implement this Plan at the referenced facility and will provide the means necessary to control impact to the environment as a result of the application of water based bentonitic drilling fluids and associated drilling cuttings as surficial soil amendments.

Please allow IPT to act as an agent for WARD PETROLEUM Corporation.  
Mark Jopling ,VP of Operations, WARD PETROLEUM

Paul Gottlob Date: 6/12/2014

Ward Petroleum owner or authorized agent Signature

Paul Gottlob - Integrated Petroleum Technologies - agent for Ward Petroleum

Printed Name