



Waste Management Plan

Archer Field Oil and Gas Development Plan

This Waste Management Plan has been prepared by Chaco Energy Company (Chaco) for its Archer Field Oil and Gas Development Plan (OGDP) in Cheyenne County, Colorado. The Plan addresses the Energy & Carbon Management Commission (ECMC) requirement at Rule 304.c.(11) to prepare a Waste Management Plan, ECMC's Waste Management Plan Guidance (September 15, 2021), and the waste management criteria in Rule 905.a.(4). The Plan addresses the following locations:

Table 1. Locations

Location	Location ID	Qtr Qtr T12S R44W	Lat/Lon
Champlin 360 Amoco A #4	380504 (Re-entry)	NWSE Sec. 29	38.977390, -102.359945
Pelton 41-31 #1	380356 (Re-entry)	NENE Sec. 31	38.969823, -102.373764
Champlin Tank Pad	New	NWSW Sec. 29	38.977813, -102.369827
Pelton Tank Pad	New	NENE Sec. 31	38.970818, -102.372405

1.0 Waste Streams

Chaco will re-enter and complete one previously plugged and abandoned conventional vertical well at each well pad location. Chaco will construct a separate tank pad for each well location. Wells will be approximately 5,400 feet deep. Chaco will re-enter each well using a workover rig. Chaco will remove the well plug, run new production casing, and perforate the well. Chaco will use freshwater for well re-entry and recycled produced water for well completion. There will be no hydraulic fracturing, stimulation, or flowback.

Waste streams are described in Attachment A. Attachment A distinguishes Well Pad from Tank Pad and the following operational phases: Drilling, Completion, Production, and All. For each waste stream, Attachment A lists phase, waste type, duration, containment, estimated volume, disposal, and waste classification.

The Construction and Interim Reclamation operational phases are captured under "All" in Attachment A. Construction and Interim Reclamation will generate only general trash, such as food wrappers and seed and mulch packaging. Packaging will be disposed of as domestic waste.

2.0 Haul Route, Waste Handling, and Characterization

Haul Route - Haul routes are listed below. They are illustrated in Attachment B.

Firstview Landfill

CR 43 to CR BB
S on US 385
E on CR V

Mitchell 41-35 #1 UIC Well

CR 43 to CR BB
S on US 385
E on CR Z
S on CO 57
E on CR V

Denver Arapahoe Disposal Site

CR 43 to CR BB
N on US 385
W on I-70

Drill Cuttings – There will be no drill cuttings. Well re-entry uses a workover rig to re-enter the well and remove the cement plug.

Fluids – Fluids handling is listed in Attachment A by operational phase. There is no well drilling, so no drilling mud. Well re-entry will use freshwater. Completion will use recycled produced water. Freshwater returns will be stored in a steel tank and recirculated. Recycled produced water will be stored in a truck tank for 1 day of well completion. Final disposal for fluids will be the underground injection control (UIC) well listed in Attachment A. During production, produced water will be disposed of in the same UIC well.

Oily Waste and Chemical Container – Waste will be disposed of at Waste Management's disposal facility listed in Attachment A.

Cement Returns – cement that has gone downhole will be disposed of at Waste Management's disposal facility listed in Attachment A. Excess cement that has not gone downhole will be disposed of as non-hazardous solid waste at the municipal landfill in Attachment A.

Tank Bottoms – During production, tank bottoms will be disposed of at Waste Management's disposal facility listed in Attachment A.

Other Wastes – Incidental trash will be bagged and secured for offsite disposal as domestic trash. Incidental packaging will be containerized to prevent blowing waste before transport for disposal. These domestic wastes will be landfilled.

Waste Characterization – Wastes will be E&P exempt from federal hazardous waste regulations. Waste will be characterized using a waste profile, process knowledge, and laboratory analysis as required by the commercial disposal facility. The E&P wastes transported offsite will be manifested and signed by the generator and transporter. Records will be maintained at Chaco's office in Denver, Colorado. Records will be provided upon request for a minimum of 5 years. Transported waste will include the information listed below.

- The date of the transport
- The identity of the waste generator
- The identity of the waste transporter
- The location of the waste pickup site
- The type and volume of waste
- The name and location of the treatment or disposal site

3.0 Spill Response and Remediation

Materials, such as absorbents, booms, shovel, and bucket, will be available to support cleanup of small leaks or spills.

In the event of a larger incident that exceeds Chaco's capacity to contain and control contamination, a third-party provider would be engaged for spill response and any necessary reporting would be provided to ECMC.

During production, well pads will have only a wellhead. Tank pads will have one produced water tank and one condensate tank inside of steel lined secondary containment sized to contain 150 percent of the volume of the largest tank, in accordance with Rule 603.o.

4.0 Plugging and Abandonment and Decommissioning

Chaco will conduct plugging and abandonment in compliance with ECMC Rules and an approved Form 6. During well plugging, Chaco will store any excess fluids in tanks for commercial disposal. Debris, risers, and surface equipment will be removed within 3 months of plugging the well. Disposal of E&P waste and synthetic liner material will be conducted according to applicable federal, state, and disposal facility requirements.

Chaco will decommission each location in accordance with Rule 911 and separate approved Form 27s by location. Chaco will document conditions at the location through observation, field screening, and sampling and lab analysis to determine if produced fluids or E&P waste was released. Per Rule 911.a.(4) Guidance (September 20, 2021), Chaco also will document hydrocarbon or salt staining or odor. The investigation at each location will be used to demonstrate that no residual impacts remain at the location. For sampling and analysis, Chaco will ensure adequate grab sample coverage and analysis of potentially impacted areas. Samples will consist of discrete, not composite, samples for site characterization. Samples will be analyzed by an approved commercial lab for constituents in Table 915-1. If impacted soil or releases are discovered, Chaco will report according to criteria in Rule 912.b and a Form 19 and will conduct necessary sampling for the vertical and horizontal extent for remediation and management

pursuant to Rule 913. Chaco will visually inspect and field screen around flowline removal and in accordance with Rule 1105. If there is indication of impacts, Chaco will sample to demonstrate compliance with Table 915-1. If impacted soil or releases are discovered, Chaco will follow the procedure described above for remediation and management.

5.0 Waste Minimization, Reuse and Recycling

Freshwater will be recirculated during well re-entry to reduce the volume of waste. Recycled produced water will be used during well completion. Salvaged topsoil will be reused on site to support interim and final reclamation at each Oil and Gas Location. Waste streams will not be commingled such that they no longer qualify as solid waste or E&P exempt from federal hazardous waste regulations. Unused material will be removed for reuse at another well site and will not be stored on the location.

6.0 Best Management Practices

Best management practices are listed in Table 2.

Table 2. Best Management Practices

Best Management Practice
<ul style="list-style-type: none">• Trash will be removed from the locations for disposal as domestic solid waste at an approved waste disposal facility.
<ul style="list-style-type: none">• Tanks and containers will be labeled according to requirements of Rule 605.h.
<ul style="list-style-type: none">• Waste streams will not be commingled such that they no longer qualify as solid waste or E&P exempt from federal hazardous waste regulations.
<ul style="list-style-type: none">• Wastes will be stored in containers or on lined containment that is chosen for compatibility and checked for leaks or integrity problems. Examples of containment include but are not limited to steel tanks, lined containment, plastic totes, drums, etc.
<ul style="list-style-type: none">• Good housekeeping measures will be implemented in the operating area to ensure safety and environmental health.
<ul style="list-style-type: none">• Unused material will be removed for reuse at another site or returned to the vendor as a product and will not be stored on the location.

Attachment

Attachment A – Waste Streams

Attachment B – Haul Routes

Attachment A

Waste Streams

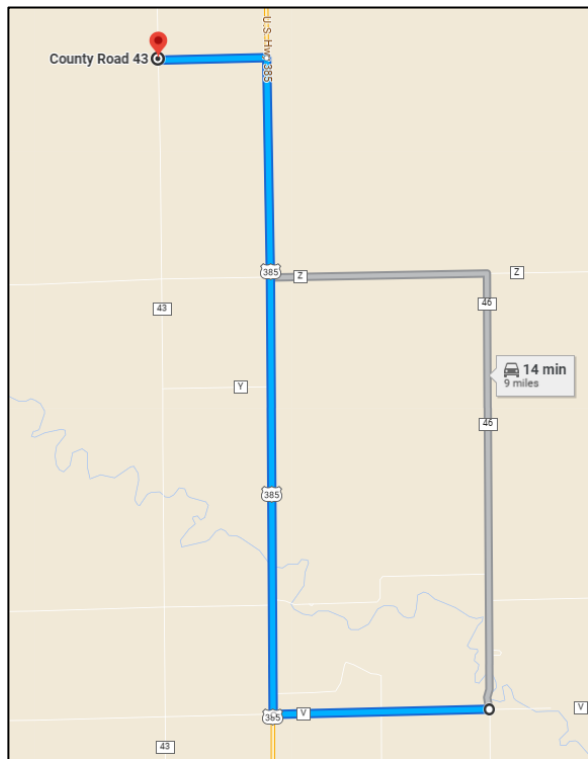
Phase	Waste Type	Duration	Containment	Estimated Volume	Disposal	Waste Classification
Well Pad Well Re-entry						
Drilling (re-entry)	Re-circulated water	2 days	Steel tank	800 bbls/well	Halde Oil UIC well ¹	Rule 805
Completion	Recycled produced water	1 day	Truck tank	50 bbls	Halde Oil UIC well	Rule 805
Completion	Excess cement that has not gone downhole	1 day	Open-top bin	Minimal	Municipal solid waste landfill ²	Non-hazardous solid waste
Completion	Cement returns	1 day	Open-top bin	Minimal	Waste Management DADS Facility ³	Federal E&P exempt as hazardous waste
Tank Pads						
Production/Final Disposal	Produced water	20-year life	Steel tank	5000 bbls, est.	Halde Oil UIC well	Rule 805
Production/Final Disposal	Tank bottoms	20-year life	Condensate tank until cleaned out by vacuum truck	40 bbls	Waste Management DADS Facility	Reclaimed/Recycled
Production/Final Disposal	Oily waste ⁴	20-year life	100-gallon polyethylene tote	Portion of 100-gallon tote per year	Waste Management DADS Facility	Federal E&P exempt as hazardous waste
Production/Final Disposal	Chemical container	20-year life	Polyethylene tote	Any product leakage over life of well	Waste Management DADS Facility	Federal E&P exempt as hazardous waste
Final Disposal	Plugging fluids	One-time	Steel tank	200 bbls, est.	Waste Management DADS Facility	Federal E&P exempt as hazardous waste
All	General trash, non-hazardous wastes	20-year life	Container to avoid blowing trash	1 drum/month	Municipal solid waste landfill	Domestic waste

¹Halde Oil, Inc. Mitchell 41-35 #1 UIC Well: Facility ID/API #150412 NE ¼ NE ¼ Section 35, Township 13 South, Range 42 West, Cheyenne County, CO

²Firstview Landfill, Cheyenne County, CO

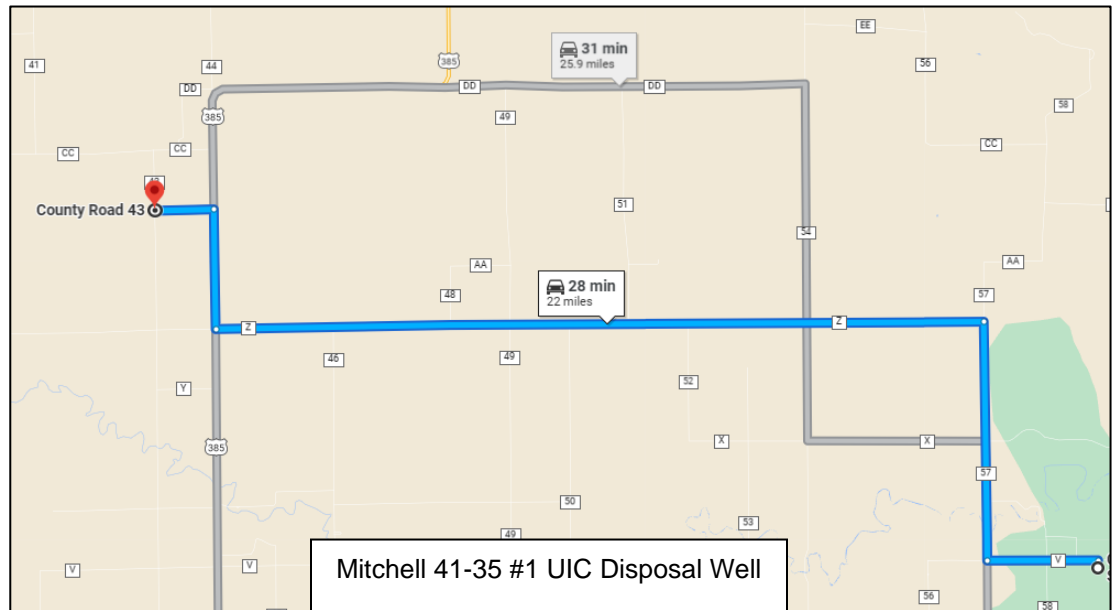
³Waste Management Denver Arapahoe Disposal Site (DADS), Arapahoe County, CO

⁴Potential for oily waste from investigation derived waste (IDW) would receive containment and disposal at the same facility



Firstview Landfill

Attachment B Haul Routes



Mitchell 41-35 #1 UIC Disposal Well



Denver Arapahoe Disposal Site