

State of Colorado
Oil and Gas Conservation Commission

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FOR OGCC USE ONLY
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SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☒ Other (describe): drill cuttings

OGCC Employee:
☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV
Tracking No:

OGCC Operator Number: <u>10516</u>	Contact Name and Telephone: <u>Bryan Burns</u>
Name of Operator: <u>LINN Operating, Inc.</u>	No: <u>303-999-4245</u>
Address: <u>1999 Broadway, Suite 3700</u>	Fax: <u>303-999-4345</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80202</u>	
API Number: <u>05-045-16135</u>	County: <u>Garfield</u>
Facility Name: <u>Chevron I31 596</u>	Facility Number: <u>335964</u>
Well Name: <u>Chevron #31-17D</u>	Well Number: <u>31-1D</u>
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>NE 1/4 SE 1/4 Sec 31 T5S R96W</u> Latitude: <u>39.572642</u> Longitude: <u>108.215221</u>	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): drill cuttings

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☒ Y ☐ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): rangeland and natural gas production

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: _____

Potential receptors (water wells within 1/4 mi, surface waters, etc.): _____

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>drill cuttings contained within soil berm</u>	<u>laboratory testing</u>
<input type="checkbox"/> Vegetation	_____	_____
<input type="checkbox"/> Groundwater	_____	_____
<input type="checkbox"/> Surface Water	_____	_____

REMEDIALATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

Pit is currently being drained and prepared for decommissioning. Drill cuttings, liquids, the synthetic liner, and any stained soil beneath the liner will be excavated and tested for Table 910-1 parameters. These cuttings will then be stockpiled on site before landfarming begins.

Describe how source is to be removed:

Drill cuttings and all other material will be excavated from the production pit, stockpiled on the well pad, and enclosed by a soil berm. Landfarming will then commence to treat the soil and periodic discrete sampling will monitor remediation progress. When soil meets the Table 910-1 standards, it will be spread onsite and used in reclamation.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

Drill cuttings will be landfarmed on site within a bermed area. Background soil samples will also be collected and analyzed for arsenic in the vicinity of the pit to characterize natural soil arsenic concentrations.

**REMEDIAL WORKPLAN (Cont.)**

OGCC Operator No: _____

Received Date: _____

Well Name & No: _____

Facility Name & No: _____

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

There are no impacts to groundwater.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

The site is currently used for water storage. After the use of water storage pit is completed, the pit will be drained, liner removed and disposed of at a certified land fill. Once background levels of arsenic in the drill cuttings are demonstrated and COGCC Table 910-1 standards are met, drill cuttings will be blended with non-contaminated on-site materials and buried in the pit and compacted. The remainder of the pit will be backfilled using native rock and soil, regraded to conform to the surrounding ground surface, and reseeded using an approved seed mix. Noxious weeds will be controlled as necessary using approved methods.

If COGCC Table 910-1 standards are not met, then the spoil material taken from the pit bottom will be treated on site by land farming. The pit will be excavated until clean soil is apparent and will be tested again and will be repeated until 910-1 Standards are met. The existing spoil material that is on site will also be tested and land farmed on site if required. The treatment will include adding nitrogen and/or phosphorus amendments. The treated contaminated material meeting COGCC minimum standards will be blended with clean non-contaminated on-site materials and will be buried on location per COGCC standards. Exterior slopes on west and south sides shall be pulled up and materials will be pushed into existing pit. The exterior slopes will be laid back at a minimum 3:1. Top soil will be spread over all slopes and will be reseeded with a Chevron approved seed mix. The location will also be fenced to keep cattle off revegetated area.

Linn Operating, Inc. has addressed and will accommodate the wildlife concerns during the site stabilization of this pad.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☒ Y ☐ N If yes, describe:

During closure of the water storage pit, samples of the pit bottom materials will be collected and analyzed for the Table 910-1 parameters to evaluate the compliance with the standards. Bi-annual sampling will be conducted until all land farming areas meet safe standards set and approved by the COGCC.

Final disposition of E&P waste (land treated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

The remediated drill cuttings and water storage pit bottom materials will be blended with on-site materials and buried in the pit as described above.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 7/14/2014

Date Site Investigation Completed: _____

Date Remediation Plan Submitted: _____

Remediation Start Date: 7/14/2014

Anticipated Completion Date: 07/14/2016

Actual Completion Date: _____

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Bryan Burns

Signed: 

Title: Environmental, Health, and Safety Representative

Date: 9/10/2015

OGCC Approved: Carlos Lujan, Ph.D.

Title: _____

Date: _____

Digitally signed by Carlos Lujan, Ph.D.
 DN: cn=Carlos Lujan, Ph.D., o=COGCC, ou=EPS NW Region, email=carlos.lujan@state.co.us, c=US
 Date: 2015.09.14 16:26:48 -0600

See attached Conditions of Approval (COAs).



Linn Operating Inc.
Piceance Asset
Parachute, Colorado

I31 596 Interim Site Stabilization Plan
July 14, 2014

- Pit will be drained; liner removed and disposed of at a certified land fill.
- Soil samples from bottom of pit will be analyzed
 - If spoil does not meet COGCC 910-1 standards, that spoil will be land farmed on location until standards are met. Bi-annual sampling will be conducted until all land farming areas meet standards.
 - If spoil meets COGCC 910-1 standards, then pit will be backfilled and site stabilization will take place as described below
- Spoil material that is being treated on site by land farming is remnants from drilling and completion operations from wells on this pad. The existing spoil material shall remain on site and we will continue to conduct land farming operations. This treatment could possibly include adding a nitrogen and/or phosphorus amendment. The treated contaminated material meeting COGCC minimum standards will be blended with clean non-contaminated on-site materials and will be buried on location per COGCC standards.
- Exterior slopes on west and south sides shall be pulled up and materials shall be pushed into existing pit.
- Exterior slopes shall be laid back at a minimum 3:1
- Top soil will be spread over all slopes.
- Location will be seeded with a Chevron approved seed mix.
- Location will be fenced to keep cattle off re-vegetated area
- Linn Operating, Inc. has addressed and will accommodate the wildlife concerns during the site stabilization of this pad.

Conditions of Approval for Linn Energy Chevron I-31 596 Pit Closure:

The Form 27 is conditionally approved; however, additional information or activities may be required during the course of remediation.

Pit Closure:

- Operator shall notify the COGCC 72 hours prior to beginning sampling and/or pit closure activities.
- The extent of impact shall be determined by field instrumentation (PID, Petro Flag, etc.) and confirmation sampling, *NOT* by visual/olfactory evaluation after excavation.
- Submit soil analytical results and a summary of pit closure activities via and amended Form 27.
- Pit excavation shall not be backfilled prior to 910-1 confirmation sampling.
- Fluid and sludge shall be removed prior to liner removal.
- The liner shall be removed intact as practicable, to prevent impact to material beneath the liner; removal of the liner by backhoe, mixing pieces of it with soil, is unacceptable.
- Liners shall be disposed of at an approved facility.
- Discrete samplings shall be collected from the bottom and each of the sidewalls of the pit.
- A minimum of three samples should be collected at the bottom of the pit, including the lowest point and/or spots with highest PID readings. Sample locations shall be presented in the final report (e-form 04 Notice of Closure)

In Situ Soil Treatment:

- Land Treatment of oily waste shall be performed in strict accordance with the requirements of COGCC Rule 907.e.(2).
- Provide surface owner's approval for land treatment.
- Soil will be spread on the available area of the pad in the thinnest possible layer to maximize exposure to air, water, and sunlight for bioremediation to occur. Land farming layer should be no thicker than 18 inches.
- If the operator prefers to use the "wind row" approach, the height of the wind row piles should not exceed 6 feet. Enough work space must be provided for heavy equipment to perform the soil mixing operation.
- The frequency of farming (tilling, disking, nutrient loading, surfactants, etc.) shall be more frequent, and aggressive enough to reduce the constituents of concern (i.e. at least three to four times during the growing season). This should be based on analytical results and not visual inspection alone.
- LINN shall provide a schedule for working the treatment areas.
- Soil samples shall be collected from the treatment areas at a frequency to determine rate of biodegradation.
- Progress samples shall be analyzed for Total Petroleum Hydrocarbons (TPH) – gasoline range organics (GRO), diesel range organics (DRO) and Polycyclic Aromatic Hydrocarbons (PAHs).

- Provide sample results with sample location diagram, summary table of results compared to Table 910-1 standards, and full laboratory reports.
- Final confirmation samples prior to reuse of the material shall be analyzed for TPH – GRO & DRO, PAHs, Electrical Conductivity (EC), pH, Sodium Adsorption Ratio (SAR).
- If one or more of the inorganics (EC, pH or SAR) exceed Table 910-1 standards, operator will be required to provide a plan to the COGCC for approval to either bury the waste with at least 3-feet of clean fill, or reuse it in another location outside of active agricultural areas. If buried off site, land owner permission is required (see Rule 907.e.(2)).
- No additional wastes shall be treated in the land treatment area. Addition of other waste will result in a violation of use of the land treatment area, and the location will be converted a CE&P facility and must meet Rule 908. d. requirements.
- The operator shall present monthly status reports, until it is determined that the project is moving forward at a satisfactory pace. These status reports can be a brief summary of what was done, if anything. Additionally, a more detailed status report shall be provided twice a year.
- Operator shall complete remediation within three years of the date of this conditional approval. Any treated waste failing to meet Table 910-1 standards within three (3) years, must be removed and disposed of at a commercial facility within 30 days. Disposal documentation must be received by COGCC within 15 days following disposal.

Soil Sampling Procedure:

For screening purposes, operator may use his preferred protocol given that this is an internal tracking procedure.

Number of samples for compliance purposes (as a minimum):

- Operator will 1) report the approximate volume and shape of the waste material pile (volume, area, height), 2) provide a figure showing the area occupied or to be occupied by the waste material, and 3) Indicate in the figure the sampling locations and depths.
- For soil piles equal or less than 500 cu yards:
One composite sample for every 250 cu yards. Every composite sample made of 6 sub-samples.
 - For fairly spread out, land farmed material, eight (6) random samples at least one (1) foot deep.
 - For stockpile or wind row, four (4) shallow samples two (2) or more feet deep toward the perimeter of the pile, and two (2) deep samples four (4) or more feet deep toward the center of the pile (consider a backhoe).
- For soil piles from 500 and up to 2000 cu yards:
Two (2) composite samples for the first 500 cu yards plus one composite for every 500 cu yards.
- For soil piles larger than 2000 cu yards:
Five (5) composite samples for the first 2000 cu yards plus one composite for every 1000 cu yards.

Example: A 5000 cu yards pile will require eight (8) composite samples. Each composite sample made of 6 sub-samples.

Operator may propose an alternate soil sampling procedure via e-form 04.