

State of Colorado Oil and Gas Conservation Commission

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#5990

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4/11/2012

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.

OGCC Employee:

☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV

Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

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

OGCC Operator Number: 16700

Name of Operator: Chevron USA, Inc.

Address: 760 Horizon Drive

City: Grand Junction

State: CO Zip: 81506

Contact Name and Telephone:

Eric Page

No: Cell: 832.439.3832 Office: 713.372.1022

Fax: NA

API Number: 045-10727

County: Garfield

Facility Name: Skinner Ridge

Facility Number: 286034

Well Name: SKINNER RIDGE 698-12-02

Well Number: 324307

Location: (QtrQtr, Sec, Twp, Rng, Meridian): SENW 12 6S 98W

Latitude: 39.5478613 Longitude: -108.280242

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Produced water, condensate, drilling 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.): Non-crop land

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Happle very channery sandy loam

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Deer Park Gulch and Clear Creek

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

Impacted Media (check):



Soils



Vegetation



Groundwater



Surface Water

Extent of Impact:

Impacted soils in lined pit, no impacts below liner.

How Determined:

See attached analytical results and sampling plan.

REMEDIALATION WORKPLAN

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

Initial work at this location consisted of the removal of the netting material and fencing in order to access the pit. The exposed liner material that was on top of the pit contents was removed using an excavator. All gross pit material was shaken off the liner while it was being removed. The liner material was then cut into manageable sized pieces and was stored temporarily in a bermed area at the pit location.

Describe how source is to be removed:

Excavation of the pit material occurred between 9/9/11 and 9/12/11. This material was stockpiled within a bermed area on the well pad. Excavation continued until there were no visual impacts observed after the lower pit liner was encountered. Confirmation samples were collected from the north and south floor areas of the excavation and the west wall on 9/13/11. Sample results are presented in Table 1 as 12-2 "sample location" CONF.

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.:

Pit contents were mixed with approximately 2,088 cy of soil from a nearby borrow area and tested to verify that constituent concentrations in mixed soil did not exceed COGCC regulatory requirements summarized in Table 910-1 as listed on the attached Table 1. The mix ratio was determined by analyzing three bench scale mixes of borrow area material to pit contents (1:1, 2:1, 3:1) presented in Table 1 and identified as 12-2 BENCH "mix ratio". Based on these results, the Pit 12-2 material was mixed at a ratio of 3:1 to meet COGCC allowable limits and provide adequate volume to backfill the pit.

Submit Page 2 with Page 1



Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: Pit # 286034

Page 2

REMEDIAL WORKPLAN (Cont.)

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):
Impacted material was excavated until clean native soil was observed and tested. No groundwater was observed, therefore groundwater was not impacted from the pit.

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 pit contents were mixed with soil from the borrow area at a ratio of approximately 3:1. Mixing occurred by placing one loader bucket of pit material into the pit, then placing 3 loader buckets of borrow material into the pit and mixing the material in the pit with an excavator until well mixed. The material was then compacted by wheel-rolling the material with the front-end loader. On 10/12/11, samples were collected from the backfill material. These samples were collected from the south, center, and north areas of the pit at random depths. The results of these backfill samples are located in Table 1 and are identified as 12-2 BACKFILL "backfill location". The final surface was graded to match the existing elevation of the well pad and will be utilized as a traffic area.

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:

Based on the backfill and pit confirmation sample results, further investigation is not required. Three background soil samples were collected from the edges of the well pad away from the 12-2 pit and analyzed for Sodium Adsorption Ratio (SAR), pH, Arsenic, and Specific Conductivity to justify elevated levels for these constituents in the backfill and confirmation samples. The backfill and confirmation results have elevated sodium adsorption ratio (SAR), pH, and arsenic above COGCC allowable limits. According to COGCC regulations section 910.b.(3).E, "Where EC of the impacted soil exceeds the level in Table 910-1, the sodium adsorption ratio (SAR) shall also be determined." The electrical conductivity (EC) of the backfill and confirmation is within COGCC allowable limits. The background samples show comparable concentrations of arsenic to the confirmation and backfill samples. While the background pH samples are relatively high and exceed COGCC allowable limits in one of the samples, the concentrations are not as high as the pH of the backfill and confirmation samples which are likely the results of naturally high pH soil from the borrow area.

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

Pit contents were mixed with borrow soil and backfilled within the closed pits.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: <u>6/6/11</u>	Date Site Investigation Completed: <u>6/8/11</u>	Date Remediation Plan Submitted: <u>7/11/11</u>
Remediation Start Date: <u>8/23/2011</u>	Anticipated Completion Date: <u>11/30/2011</u>	Actual Completion Date: <u>10/12/2011</u>

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

Print Name: Eric Page Signed: [Signature]
Title: Chermon Project Manager Date: 4/10/12

OGCC Approved: [Signature] Title: For Chris Canfield Date: 04/13/2012
EPS NW Region

Table 1
Chevron Piceance Pits
Pit 12-2

Sample Summary													
Sample Location	12-2 BENCH 1:1	12-2 BENCH 2:1	12-2 BENCH 3:1	12-2 NORTH FLOOR CONF	12-2 SOUTH FLOOR CONF	12-2 WEST WALL CONF	12-2 BKGD EAST	12-2 BKGD NORTH	12-2 BKGD WEST	12-2 BACKFILL CENTER	12-2 BACKFILL NORTH	12-2 BACKFILL SOUTH	
Sample Type	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	
Sample Date	9/13/2011	9/13/2011	9/13/2011	9/13/2011	9/13/2011	9/13/2011	9/13/2011	9/13/2011	9/13/2011	10/12/2011	10/12/2011	10/12/2011	

Laboratory Data Summary													
Analytical Parameters													COGCC Allowable Limits Table 910-1
Units													
Organic Compounds													
TPH-Total	163	119	107	41.5	76.8	47.8	NA	NA	NA	175	195.6	346.8	500 (Comb)
Gasoline Range Organics	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	12.6	19.8	*
Diesel Range Organics	163	119	107	41.5	76.8	47.8	NA	NA	NA	175	183	327	*
Benzene	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.17
Toluene	0.0152	0.0087	0.0064	ND	ND	ND	NA	NA	NA	0.007	ND	0.0082	85
Ethylbenzene	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	100
Xylenes, Total	0.0514	0.024	0.0157	ND	ND	ND	NA	NA	NA	0.0436	0.0462	0.0807	175
Acenaphthene	0.0173	0.0116	0.008	ND	0.0048	ND	NA	NA	NA	0.0161	0.0189	0.0223	1,000
Anthracene	0.0154	0.0106	0.0071	ND	ND	ND	NA	NA	NA	ND	ND	0.0043	1,000
Benzo(a)anthracene	ND	ND	ND	0.0039	ND	ND	NA	NA	NA	ND	ND	ND	0.22
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.022
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.22
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	2.2
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.22
Chrysene	0.0105	0.0067	ND	ND	ND	ND	NA	NA	NA	0.005	0.005	0.0071	22
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	0.022
Fluoranthene	0.004	0.0046	ND	ND	ND	ND	NA	NA	NA	ND	ND	0.005	1,000
Fluorene	0.0373	0.0207	0.015	0.0042	0.0069	ND	NA	NA	NA	0.025	0.0229	0.0331	1,000
Naphthalene	0.151	0.0716	0.0532	0.0153	0.0239	ND	NA	NA	NA	0.0869	0.0854	0.117	23
Pyrene	0.0137	0.0113	0.0073	0.0041	0.0049	ND	NA	NA	NA	0.0167	0.0142	0.0199	1,000
Physical Properties													
Sodium Adsorption Ratio	20.5	15.8	11	50.4	5.5	3.8	ND	ND	5	15.6	15.2	22.7	<12
Specific Conductivity	1.34	0.786	0.583	1.34	0.4	0.223	0.124	0.0938	0.133	3.44	3.52	4.65	<4
pH	11	10.5	10	9.4	9.3	9.2	8.2	7.8	9.3	10.3	10.6	11	6 to 9
Metals													
Arsenic	17.1	12.3	11.3	31.1	20.9	19.4	18.8	17.2	28.2	17.3	14.5	16.4	0.39
Barium	1300	708	937	370	390	292	NA	NA	NA	860	921	1280	15000
Cadmium	ND	ND	ND	ND	ND	0.53	NA	NA	NA	ND	0.59	0.69	70
Chromium, Hexavalent	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	23
Chromium, Trivalent	21.9	17.2	13.8	21.7	19.3	24.6	NA	NA	NA	19.2	19.9	20.1	120000
Copper	27.6	22.4	17.3	26.7	22.1	23.1	NA	NA	NA	21.7	24.1	25	3100
Lead	20.2	13.1	11.7	13.6	11.2	13.4	NA	NA	NA	13.6	15.2	15.7	400
Mercury	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	23
Nickel	17.9	12.2	11.3	17.4	13	14	NA	NA	NA	15.5	16.1	15.9	1600
Selenium	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	390
Silver	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	390
Zinc	63.6	45.5	40.6	51.4	43.4	47.2	NA	NA	NA	56.7	55.7	94.8	23000

NA - Not analyzed
ND - Parameter reported under detection limit
mg/kg - milligrams per kilogram
mmhos/cm - milliehmhos per centimeter
Result Exceeds COGCC allowable limits