FORM 27 Rev 6/99

# State of Colorado
# Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

FOR OGCC USE ONLY

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

## 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):

OGCC Operator Number: 66571
Name of Operator: OXY USA WTP LP
Address: 760 Horizon Drive, Suite 101
City: Grand Junction State: CO Zip: 81506

Contact Name and Telephone:
Daniel I. Padilla
No: 970.263.3637
Fax: 970.263.3694

05/16/2011

API Number: 05-045-10444
Facility Name: Oxy Mesa PP Pit (Pit Name)
Well Name: Cascade Creek

County: Garfield County
Facility Number: 616-21-32 (Pad Name) / Location # 324288
Well Number: 616-21-32

Location: (QtrQtr, Sec, Twp, Rng, Meridian): NENW, Sec 16, T6S, R97W, 6th PM Latitude: ~~39.526011~~ Longitude: ~~-108.229456~~

34.527277 / -106.228774

### TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Not Applicable

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 rangeland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Parachute-Rhone Loam 5-30% slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Nearest water well is ~8710' to the west. A natural drainage is ~300 feet southwest of pit location which connects to the intermittent unnamed drainage ~700' to the southwest. The unnamed drainage connects with Cascade Canyon ~4495 feet south of pit.

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

| Impacted Media (check): | Extent of Impact: | How Determined: |
|---|---|---|
| ☐ Soils | N/A | Laboratory analytical results |
| ☐ Vegetation | N/A | Visual |
| ☐ Groundwater | N/A | Visual inspection below pit liner |
| ☐ Surface Water | N/A | Visual |

### REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
Oxy submitted a Form 15 earthen pit report for the 616-21-32 production pit to the COGCC in October 2008, see attached. Oxy did not receive an approved Form 15 from the COGCC for this production pit. Oxy operated the pit for a short period of time but closed the pit in November of 2008. Oxy is providing this pit closure form/plan for COGCC review/approval.

Describe how source is to be removed:
In 2008 Oxy removed liquids found inside the production pit; no solids were encountered. Liquids removed from the pit were placed into Oxy's water system for reuse. Oxy disposed of the pit liners at the Garfield County Landfill. Based on sampling results (post production pit reclaim 11/26/2008) of the pit bottom, all analytes are found to be below allowable concentrations levels except for arsenic (As). Although the As was above the COGCC regulated concentration, Oxy collected background samples in undisturbed locations showing elevated concentrations of As which are above concentrations found in the pit bottom. Prior to constructing the production pit, Oxy collected a soil sample from the reserve pit bottom. Analytical results found exceedances in Table 910-1 for total petroleum hydrocarbons (TPH), sodium absorption ratio (SAR), electrical conductivity (EC), and As. Oxy's contactor excavated portions of the pit bottom and offset the materials on the pad for aeration to reduce TPH, and to blend the soil with native material to allow for stabilization. Excavated materials were reused as base material for the production pit. The production pit was later reclaimed, as described above.

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.:
Liquids were removed from the production pit and no solids were encountered. Liquids present in the pit were placed into Oxy's water system for reuse. The 36-mil high-density polyethylene liner and the geosynthetic clay liner were disposed of at Garfield County Landfill. Analytical concentrations found in the pit bottom are below the COGCC's Table 910-1 concentrations, except for arsenic. Oxy collected background samples in undisturbed locations which identified elevated concentrations of arsenic to be above concentrations found in the pit bottom. This pit was closed and sampled in 2008 under the old COGCC rules; therefore, PAHs and Chromium VI were ommited. Based on post production pit reclamation (post production pit reclaim 11/26/2008) analytical concentrations for TPH and total chromium, Oxy assumes no exceedances would be encountered for PAHs and Chromium VI. The site was contoured to be level with the existing pad grade in 2008, but has since been used as an approved cuttings disposal area (Document #1532786).

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**REMEDIATION WORKPLAN (Cont.)**

Tracking Number: _____
Name of Operator: _____
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.):**

No groundwater was impacted by the pit. The pit was lined with a 36-mil HDPE liner & a geosynthetic clay liner. Liquids were removed from the pit & placed into Oxy's water system for reuse; no solids were encountered during closure activities. During excavation of the pit liners, an Oxy contractor was present to observe the soil below the liner. The contractor collected soil samples from the pit bottom to ensure no environmental impacts were present. Laboratory analytical results identify compliance with the COGCC Table 910-1 allowable concentrations, except for As (attached). Although As was above the COGCC regulated concentration, Oxy collected background samples in undisturbed locations showing elevated concentrations of As which are above concentrations found in the pit bottom. The pit was closed and sampled in 2008 under the old COGCC rules; therefore, PAHs and Chromium VI were unsampled. Based on past production pit reclaim 11/28/2008 analytical sample concentrations for TPH and total chromium, Oxy assumes no exceedances would be encountered for PAHs and Chromium VI.

Note that prior to constructing the production pit, Oxy collected a soil sample from the reserve pit bottom. Analytical results found exceedances in Table 910-1 for total TPH, SAR, EC, and As. Oxy's contactor excavated portions of the pit bottom and offset the materials on the pad for aeration to reduce TPH, and to blend the soil with native material to allow for stabilization. Excavated materials were then reused as base material for the production pit. Based on previous drilling operations, Oxy believes the exceedances identified above were contained by bentonitic cuttings which lined the bottom of the reserve 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 production pit was constructed at grade with Oxy's Cascade Creek 616-21-32 well pad, and was approximately 10 feet deep. The pit liners were sent to the Garfield County Landfill for disposal. The reclaimed pit was contoured to be level with the pad grade in 2008 to minimize stormwater runoff. In 2010 Oxy began using this location for permanent disposal of drill cuttings (Document #1632786). Oxy will comply with the Cuttings Management Plan requirements for interim reclamation, and final pad reclamation will occur at the end of the life of the 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:**

Oxy monitored the site for stormwater when the pit was closed in 2008. Currently the location is being used for permanent disposal of drill cuttings, Oxy is monitoring the site for stormwater. Final reclamation will occur at time of pad closure and Oxy will follow up during the next growing season to determine if revegetation efforts were successful.

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

Oxy removed all liquids within the production pit and redistributed them into Oxy's water system for reuse. No solids were encountered during removal of the liquids from the production pit. Note that the production pit liners were disposed of at the Garfield County Landfill.

## IMPLEMENTATION SCHEDULE

| | | |
|---|---|---|
| Date Site Investigation Began: 8/25/2008 | Date Site Investigation Completed: 12/5/2008 | Date Remediation Plan Submitted: _____ |
| Remediation Start Date: ~9/05/2008 | Anticipated Completion Date: 3/1/2011 | 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: Daniel I. Padilla Signed: _____

Title: Regulatory Advisor Date: 4/15/11

OGCC Approved: _____ Title: For Chris Canfield Date: 05/17/2011

EPS NW Region


OXY USA WTP LP
760 Horizon Drive, Suite 101
Grand Junction, CO 81506
616-21-32 Production Pit
Sampling Figures
Revised: May 11, 2011
Garfield County, Colorado
0
0.01
0.02
0.03
0.04
0.05
Miles
616-21-32 pad
Post Reclaim sample location (9/17/2008)
Post Reclaim sample location (11/26/2008)
Background sample location another project

| 616-21-32 - Mesa Production Pit | |
|---|---|
| Pad #: | 616-21-32 |
| Sample Date: | 09/17/2008 |
| Clearance Achieved Date: | |

| | | Sample Identifications (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | MCL (mg/kg) | Post Reserve Pit Reclaim 9/17/2008 | Post Production Pit Reclaim 11/26/2008 | Pond G SW Background 10/21/2010 | Pond G NE Background 10/21/20010 | Pond G NW Background 10/21/2010 | Pond G SE Background 10/21/2010 |
| Organics in Soil | | | | | | | |
| TPH (GRO and DRO) | 500 | 1800 | 5.0 | 1.30 | <1.0 | 3.9 | <1.0 |
| Benzene | 0.17 | <0.0025 | <0.0025 | <0.00090 | <0.00090 | <0.00090 | <0.00090 |
| Toluene | 85 | <0.025 | <0.025 | <0.0015 | <0.0015 | <0.0015 | <0.0015 |
| Ethylbenzene | 100 | <0.0025 | <0.0025 | <0.0013 | <0.0013 | <0.0013 | <0.0013 |
| Xylenes | 175 | <0.0075 | <0.0075 | <0.0028 | <0.0028 | <0.0028 | <0.0028 |
| Organics in Soil (PAH's) | | | | | | | |
| Acenaphthene | 1000 | NA | NA | | | | NA |
| Anthracene | 1000 | NA | NA | | | | NA |
| Benzo(A)anthracene | 0.22 | NA | NA | | | | NA |
| Benzo(B)fluoranthene | 0.22 | NA | NA | | | | NA |
| Benzo(K)fluoranthene | 2.2 | NA | NA | | | | NA |
| Benzo(A)pyrene | 0.022 | NA | NA | | | | NA |
| Chrysene | 22 | NA | NA | | | | NA |
| Dibenzo(A,H)anthracene | 0.022 | NA | NA | | | | NA |
| Fluoranthene | 1000 | NA | NA | | | | NA |
| Flourene | 1000 | NA | NA | | | | NA |
| Indeno(1,2,3,C,D)pyrene | 0.22 | NA | NA | | | | NA |
| Napthalene | 23 | NA | NA | | | | NA |
| Pyrene | 1000 | NA | NA | | | | NA |
| Inorganics in Soil | | | | | | | |
| EC | <4 mmhos/cm or 2X background | 5.80 | 0.620 | 0.089 | 0.094 | 0.084 | 0.075 |
| SAR | <12 | 17.0 | 2.6 | 2.2 | 1.7 | 0.96 | 1.8 |
| pH | 6-9 | 7.7 | 8.7 | 8.7 | 8.6 | 8.0 | 8.6 |
| Metals in Soils | | | | | | | |
| Arsenic | 0.39 | 8.4 | 5.4 | 20.0 | 22.0 | 14.0 | 12.0 |
| Barium (LDNR True Total) | 15000 | 310 | 380 | | | | |
| Cadmium | 70 | 0.33 | 1.2 | | | | |
| Chromium | 120000 | 48.0 | 51.0 | | | | |
| Chromium VI | 23 | NA | - | | | | |
| Copper | 3100 | 21.0 | 21.0 | | | | |
| Lead | 400 | 16.0 | 17.0 | | | | |
| Mercury | 23 | 0.210 | 0.027 | | | | |
| Nickel | 1600 | 20.0 | 40.0 | | | | |
| Selenium | 390 | <1.0 | 3.80 | | | | |
| Silver | 390 | <0.50 | 1.4 | | | | |
| Zinc | 23000 | 54.0 | 67.0 | | | | |