



#7315

FOR COGCC USE ONLY RECEIVED AUG 07 2012 COGCC OGCC Employee: Tracking No: 667500003

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): Sensitive Area Determination

GENERAL INFORMATION

OGCC Operator Number: 95620, Name of Operator: Western Operating Company, Address: 518 17th Street, Suite 200, City: Denver, State: CO, Zip: 80202, Contact Name and Telephone: Name: Steven James, No: (303) 893-2438, Fax: ...

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Condensate and Produced Water, Site Conditions: Is location within a sensitive area (according to Rule 901e)? Y N, Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Open Pasture, Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Argusstolls-Rock outcrop complex, 1 to 9 percent slopes, Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water is located 855' northwest of the site; a building is located 2,510' northwest of the site; a water well is located 3,315' north of the site; and depth to groundwater is estimated to be 22' below ground surface.

REMEDIALTION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document): On April 10, 2012, the COGCC issued a violation following an on-site inspection (Document #667500003). Describe how source is to be removed: See attached workplan for details on the proposed remediation workplan. 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.: Any hydrocarbon material exceeding COGCC Table 910-1 Concentration Levels will be removed prior to sampling and will be disposed of at a licensed disposal facility or landfarmed on-site. Remediation of salt-impacted areas will be documented in a future Form 27.

State of Colorado Oil and Gas Conservation Commission

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



Tracking Number: Name of Operator: Western Operating Company OGCC Operator No: 95620 Received Date: Well Name & No: Nelson A-6 Facility Name & No.: Nelson A-6

REMEDIATION WORKPLAN (CONT.)

OGCC Employee

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.): Groundwater is estimated to be at a depth of at least 22 feet at the site. No groundwater samples will be collected during assessment activities.

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. If analytical results indicate the soil is compliant, the pits will be backfilled, reclaimed to previous grade, and reseeded.

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: Not applicable at this time.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.): Any hydrocarbon material exceeding COGCC Table 910-1 Concentration Levels will be removed prior to sampling and will be disposed of at a licensed disposal facility or landfarmed on-site. Remediation of salt-impacted areas will be documented in a future Form 27.

IMPLEMENTATION SCHEDULE

Table with 4 columns: Date Site Investigation Began, Date Site Investigation Completed, Remediation Plan Submitted, Remediation Start Date, Anticipated Completion Date, Actual Completion Date. Values include TBD, NA, 8/6/2012.

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

Print Name: Steven James Signed: [Signature] Title: President Date: 8/6/2012

OGCC Approved: ACE for John Axelsson Title: EPS NE Region Date: 9/20/2012

Conditions of Approval

- 1. Provide GPS coordinates for both of the pits.
2. Provide depth and size of excavations and sample depths.
3. Provide documentation of waste disposal from pits.
4. Include detailed reclamation plan to address salt kill.
5. Per inspection resulting in violation (4/10/2012, document #667500003), include documentation of appropriate disposal or treatment of oily soil observed at battery and treater in accordance with Rule 907e; and, include documentation of concrete/debris disposal or recycling. A. Eckman 9/20/2012



August 6, 2012

Mr. John Axelson  
Northeast Region Environmental Protection Specialist  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, Colorado 80203

**RE: Proposed Remediation Workplan  
Western Operating Company  
Nelson A-6 Tank Battery  
Facility #219024  
Document #667500003  
NWNW Sec. 17 T8N R54W, 6<sup>th</sup> Principal Meridian  
Logan County, Colorado**

Dear Mr. Axelson:

LT Environmental, Inc. (LTE), on behalf of Western Operating Company (WOC), is pleased to present this proposed Remediation Workplan to conduct pit closure sampling and documentation activities at the Nelson A-6 Tank Battery (Site) located in Logan County, Colorado (Figure 1). The purpose of the produced water and oil skim pit closure and related remediation activities are to satisfy the requirements set forth in a recent inspection summary (Document #667500003) which resulted in a violation filed by the Colorado Oil and Gas Conservation Commission (COGCC).

### **Background**

On April 10, 2012, the COGCC issued a violation to WOC following an on-site inspection. The inspection summary requires multiple action items be completed to obtain satisfactory conditions at the Site. LTE will assist with the following tasks at the Site:

- Provide recommendations on produced water pit and oil skim pit closure and reclamation;
- Collection of soil samples within the produced water and oil skim pits to confirm soil is compliant with COGCC Table 910-1 standards;
- Provide recommendations on assessment of salt impacted soil downgradient of the produced water pit. Reclamation will be addressed after assessment of the soil has been completed; and
- Collection of soil samples within the salt impacted area to assess the level of soil impact and evaluate the next step for proper reclamation.



## Produced Water and Oil Skim Pit Closure

The inspection notice indicates the attached Form 27 should document the proper closure of the produced water and oil skim pits. WOC will ensure the pits are compliant with COGCC Table 910-1 standards by removing any free hydrocarbons from the surface of the pits, including free oil, hydrocarbon sludge, or hydrocarbon impacted soil. Any hydrocarbon material removed prior to sampling will be disposed of at a licensed disposal facility or landfarmed on-site.

Once the pits have been sufficiently scraped of free hydrocarbons, LTE will perform the confirmation soil sampling of the pit bottoms. After the analytical results indicate the soil is compliant, the pits will be backfilled, reclaimed to previous grade, and reseeded.

LTE personnel will inspect the soil samples for petroleum hydrocarbon odor and/or staining. The soil will be screened using a photo-ionization detector (PID) to monitor the soil headspace for the presence of volatile organic vapors. LTE will collect four point composite samples from the base of the produced water and oil skim pits (Figure 2). This will result in one sample for each pit location.

The soil samples collected from the bottom of each pit will be submitted to an analytical laboratory for the following analyses:

Analyte	Method
Benzene, toluene, ethylbenzene, and total xylenes (BTEX), Total Petroleum Hydrocarbons – Gasoline Range Organics (TPH-GRO)	EPA Method 8260B
Total Petroleum Hydrocarbons – Diesel Range Organics (TPH-DRO)	EPA Modified Method 8015

## Salt-Impacted Soil Assessment

LTE will collect and submit four soil samples to assess the level of salt impact in the soil. Figure 3 depicts the proposed locations of the soil samples (SS01 and SS02). LTE will collect two samples from each location. One sample will consist of soil collected from the first 6 inches of soil, while the second sample will consist of soil collected from 18 inches to 2 feet below ground surface. This vertical characterization will aid in evaluating if the salt impact is confined to the shallow soil or has penetrated deeper into the root zone. This information will be useful in preparing a final reclamation plan for the area including revegetation. The depth and magnitude of salt-impact influences the type of reclamation necessary at the site.



LTE will composite samples from each set of SS01 aliquots to characterize the lower end of the salt-impacted area. LTE will also composite samples from the two sets of SS02 aliquots to characterize the area immediately downgradient of produced water pit. This will result in four samples to characterize the approximate 420 feet by 80 feet area described in the COGCC inspection summary.

LTE will also collect one background sample from within the healthy vegetation for comparison to the salt-impacted samples. LTE will submit the soil samples to an analytical laboratory for the following analyses:

Analyte	Method
Electrical Conductivity	Standard Method 2510B
Sodium Adsorption Ratio	USDA Handbook 60 6
pH	EPA Method 9045B

Following assessment activities, soil analytical data will be summarized and submitted to the COGCC. Should you have any questions, please contact Steven James with WOC at (303) 893-2438.

Sincerely,

LT ENVIRONMENTAL, INC.

A handwritten signature in black ink that reads "Devin Girtin". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

Devin Girtin, G.I.T.  
Staff Geologist

A handwritten signature in black ink that reads "Brian Dodek". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

Brian Dodek, P.G.  
Client Manager/Senior Geologist

Attachments:

Figure 1 – Site Location Map

Figure 2 – Produced Water and Oil Skim Pit Samples

Figure 3 – Salt-Impacted Area Sample Locations

## FIGURES



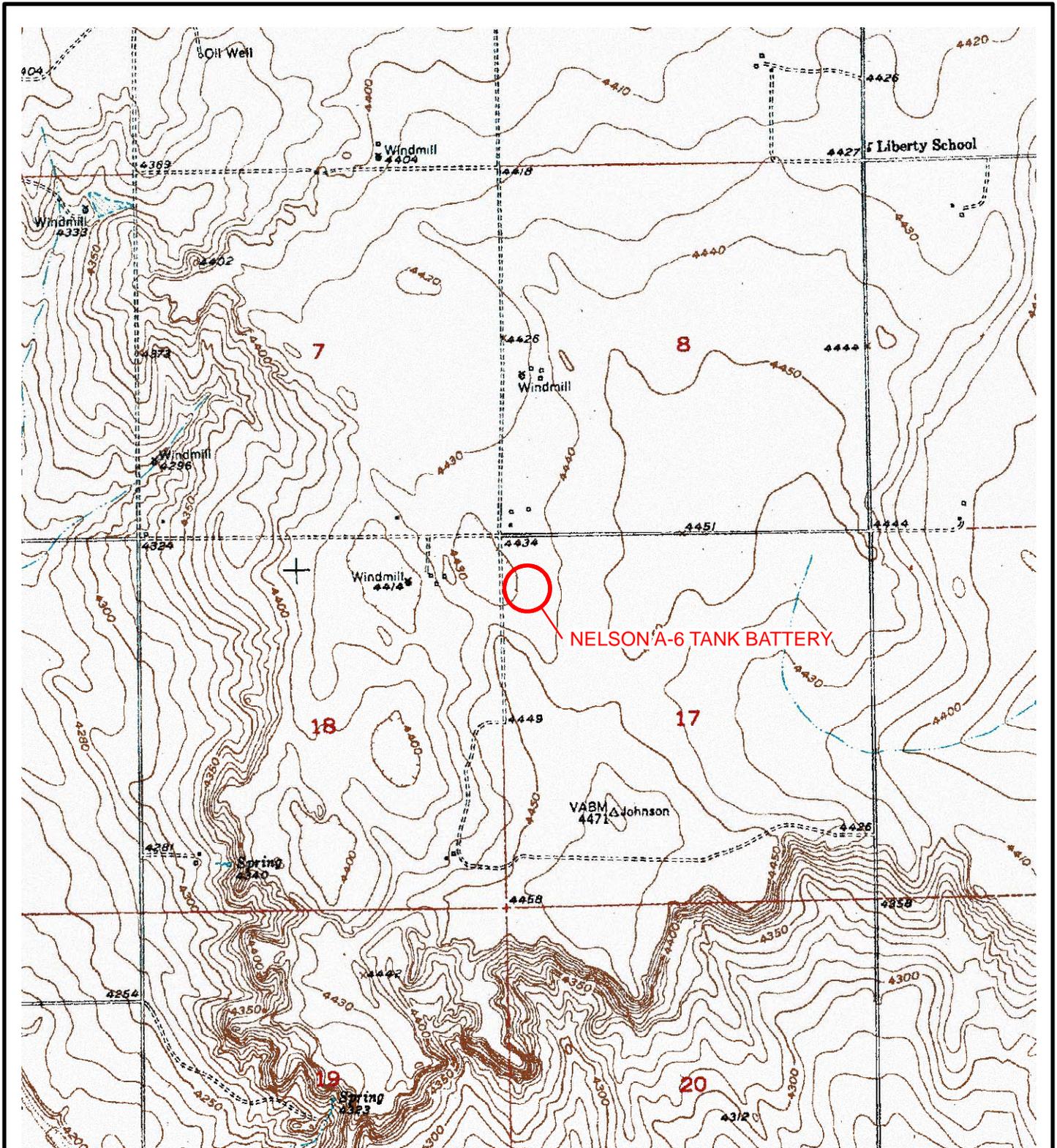
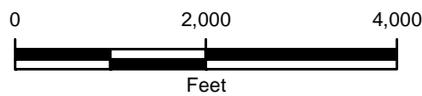


IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES

**LEGEND**

 SITE LOCATION



**FIGURE 1**  
**SITE LOCATION MAP**  
**NELSON A-6 TANK BATTERY**  
**LOGAN COUNTY, COLORADO**



**WESTERN OPERATING COMPANY**

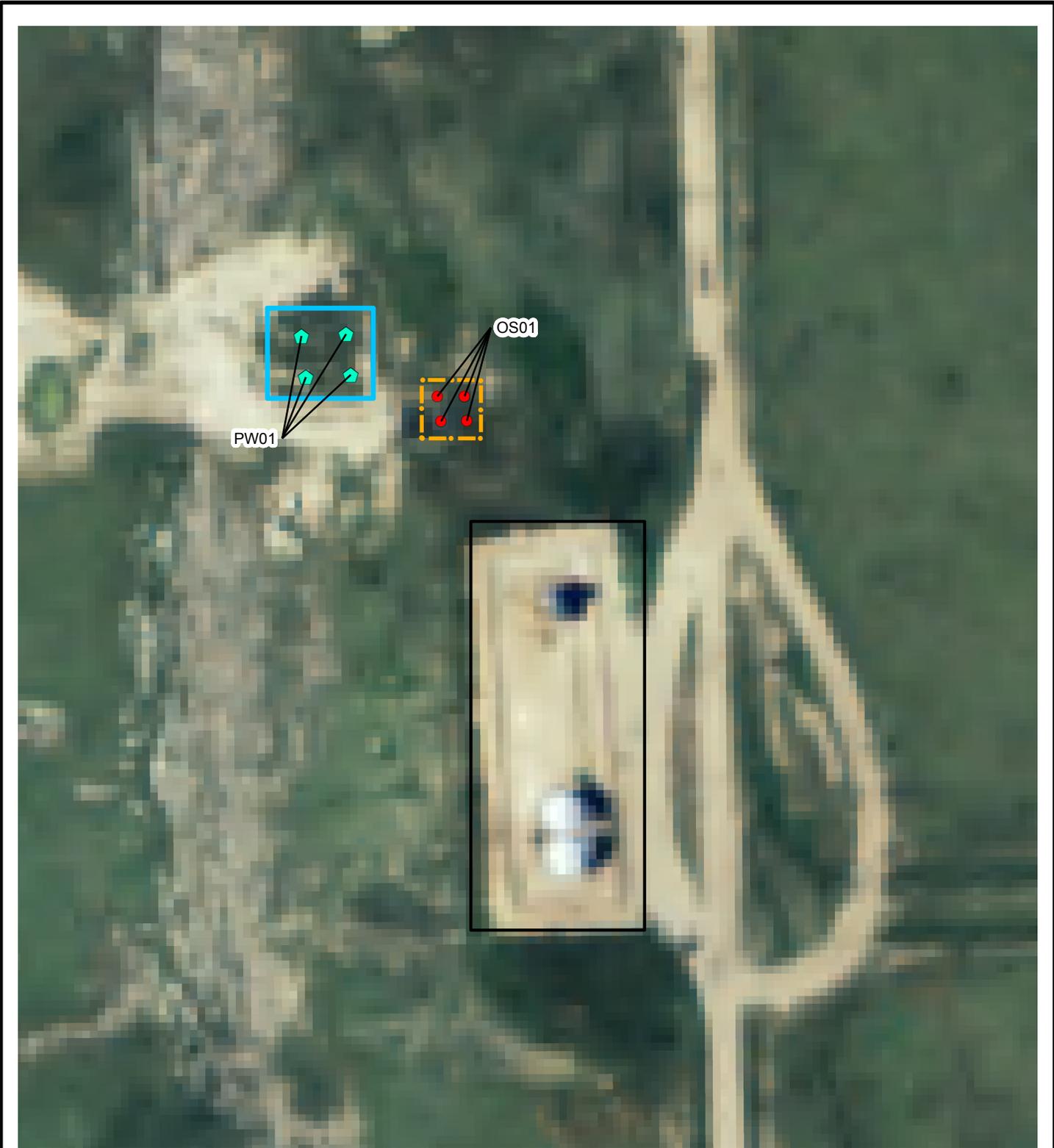
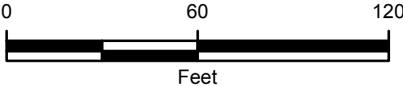


IMAGE COURTESY OF USDA/NRCS, 2011

**LEGEND**

- OIL SKIM PIT COMPOSITE SAMPLE
- ⬠ PRODUCED WATER PIT COMPOSITE SAMPLE
- OIL SKIM PIT
- PRODUCED WATER PIT
- NELSON A-6 TANK BATTERY



**FIGURE 2**  
**PRODUCED WATER AND OIL SKIM PIT SAMPLES**  
**NELSON A-6 TANK BATTERY**  
**LOGAN COUNTY, COLORADO**



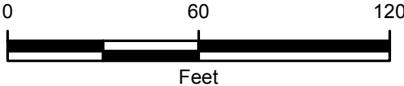
**WESTERN OPERATING COMPANY**



IMAGE COURTESY OF USDA/NRCS, 2011

**LEGEND**

-  SALT-IMPACTED COMPOSITE SAMPLE
-  BACKGROUND SAMPLE
-  SALT-IMPACTED AREA



**FIGURE 3**  
**SALT-IMPACTED AREA SAMPLE LOCATIONS**  
**NELSON A-6 TANK BATTERY**  
**LOGAN COUNTY, COLORADO**

**WESTERN OPERATING COMPANY**

