

Savage and Savage *Environmental*

practical solutions for environmental issues

4610 Haystack Drive
Windsor, Colorado 80550

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Transmittal

To: Ryan Hawkins
Company: Noble Energy, Inc.
Address: 804 Grand Avenue
City, State, Zip: Platteville, CO 80651
Phone: 970-785-5000
Via: U.S. Post Office

From: Edith Savage
Company: Savage and Savage, Inc.
Project: Lorenz F22-17, F22-18D, F23-31D
Drill Pad
Phone: 970-674-8080
Fax: 970-674-8088
Date: September 28, 2011

Attached for your files is concurrence from the U.S. Army Corps of Engineers that the Lorenz F22-17, F22-18D, and F23-31D drill site is man-induced due to irrigation. A Corps permit is not required for this site.



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
DENVER REGULATORY OFFICE, 9307 S. Wadsworth Boulevard
LITTLETON, COLORADO 80128-6901

September 26, 2011

Ms. Edith Savage
Savage and Savage
4610 Haystack Drive
Windsor, CO 80550-2597

**RE: Noble Energy, Lorenz F22-17, F22-18D & F23-31D Drill Pad
Artificially Irrigated Agricultural Field Wetlands
Corps File No. NWO-2011-1952-DEN**

Dear Ms. Savage:

Reference is made to the above-mentioned project located at 40.39053; -104.64242, Weld County, Colorado. Mr. Terry McKee of my office accepts your wetland delineation and mapping associated with this project.

This project has been reviewed in accordance with Section 404 of the Clean Water Act under which the U.S. Army Corps of Engineers regulates the discharge of dredged and fill material, and any excavation activity associated with a dredge and fill project in waters of the United States. The wetland located in on this site as identified in your September 16, 2011 letter to Mr. Terry McKee of my office is not waters of the U.S.

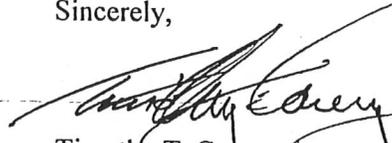
Reference is made to the November 13, 1986 Federal Register (Page 41217), Part 328 (a) Non-tidal drainage and irrigation ditches excavated on dry land, (b) artificially irrigated areas which would revert to upland if the irrigation ceased, (c) artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing, (d) artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons, and (e) waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States (as defined in 33 CFR 328.3(a)).

The Corps of Engineers generally does not consider the above types of aquatic resources waters of the U.S. except on a case-by-case basis. The wetland located on this site as identified in your September 16, 2011 letter/report falls under the description of artificially irrigated areas which would revert to upland if the irrigation ceased.

Based on the information provided, a Department of the Army (DA) Permit will not be required for work at this site. Although a DA Permit will not be required for the project, this does not eliminate the requirement that other applicable federal, state, and local permits be obtained as needed.

If there are any questions call **Mr. Terry McKee** of my office at **(303) 979-4120** and reference **Corps File No. NWO-2011-1952-DEN**.

Sincerely,



Timothy T. Carey
Chief, Denver Regulatory Office

tm

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Address: 804 Grand Avenue
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From: Edith Savage
Company: Savage and Savage, Inc.
Project: Lorenz F22-17, F22-18D & F23-31D
Phone: 970-674-8080
Fax: 970-674-8088
Date: September 16, 2011

Attached for your review is the Lorenz F22-17, F22-18D & F23-31D wetland delineation and concurrence request. Upon your approval I will submit this package to the Corps.

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savageandsavage@earthlink.net



September 16, 2011

Terry McKee
US Army Corps of Engineers
9307 South Wadsworth Blvd
Littleton, Colorado 80128-6901

**RE: Noble Energy, Lorenz F22-17, F22-18D & F23-31D Drill Pad
Concurrence Request for Non-Jurisdictional Wetland**

Mr. McKee:

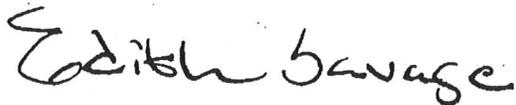
Savage and Savage, on behalf of Noble Energy, Inc., requests concurrence that the Lorenz F22-17, F22-18D & F23-31D drill pad site is non-jurisdictional. The drill site is located within an irrigated hayfield. The proposed site is located approximately 0.8 miles northwest of Weld County Roads 54 and 45. The latitude of the project site is 40.39053 degrees north and longitude is 104.64242 degrees west. The average elevation of the project site is 4629 feet. The site is located within the NE¼, Section 22, Township 5 North, Range 65 West of the 6th Prime Meridian, Weld County, Colorado.

A Noble Energy staff member interviewed Mr. Lorenz (the landowner) about the site. Mr. Lorenz stated that he installed an irrigation system for the hayfield in the 1930's. He indicated that he brought water under the road from a corn field on the secondary terrace to an irrigation canal and lateral ditches that he built for the hayfield on the

primary terrace. Over time, after decades of irrigation the hayfield has taken on the characteristics of a wetland. Without the continued flood irrigation, the field would revert to a mesic meadow, of the type present in adjacent native primary terrace areas.

If you have any questions or require further information about the Lorenz F22-17, F22-18D & F23-31D drill site please contact me.

Sincerely,

A handwritten signature in black ink that reads "Edith Savage". The signature is written in a cursive style with a large initial "E".

Edith Savage
Principal

c: Ryan Hawkins, Noble Energy, Inc.

attachment: Lorenz F22-17, F22-18D & F23-31D Wetland Delineation

**NOBLE ENERGY, INC.
LORENZ F22-17, F22-18D & F23-31D DRILL SITE
WATERS OF THE UNITED STATES IDENTIFICATION
AND WETLAND DELINEATION
WELD COUNTY, COLORADO**



Prepared by: **Savage and Savage, Inc.**
4610 Haystack Drive
Windsor, CO 80550
970 674 8080

September 2011

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FIGURES

1. Noble Energy Lorenz F22-17, F22-18D & F23-31D Wells; General Location Map
2. Lorenz F22-17, F22-18D & F23-31D Sample Point 001.
3. Lorenz F22-17, F22-18D & F23-31D Sample Point 002.
4. Noble Energy Lorenz F22-17, F22-18D & F23-31D Well Site; Wetland Map

APPENDIX

U.S. Army Corps of Engineers Great Plains – Interim Version Data Sheets

INTRODUCTION

Savage and Savage conducted a wetland delineation within the proposed Lorenz F22-17, F22-18D, F23-31D drill pad for Noble Energy, Inc. on September 13, 2011. The proposed drill site is located approximately 0.8 miles northwest of Weld County Roads 54 and 45, and is accessed from Greeley by proceeding south on US Highway 85 to Weld County Road 54 (37th Street, Evans), east on Weld County Road 54 to Weld County Road 45, then north approximately 0.8 miles to the site. The latitude of the project site is 40.39053 degrees north and longitude is 104.64242 degrees west. The average elevation of the project site is 4629 feet. The site is located within the NE $\frac{1}{4}$, Section 22, Township 5 North, Range 65 West of the 6th Prime Meridian, Weld County, Colorado (Figure 1).

STUDY METHODS

A wetland delineation was conducted in accordance with the requirements of the U.S. Army Corps of Engineers Wetlands Delineation Manual and Interim Supplement (USACE, 1987, 2008). To determine the areas subject to Corps jurisdiction, three criteria were evaluated: (1) evidence of a hydrologic regime reflecting saturation or periodic inundation by surface or ground water of sufficient duration and frequency, (2) soils which are considered hydric by classification or field characteristics indicating anaerobic conditions, and (3) a prevalence of vegetation typically adapted to areas of wetland hydrology and soils.

At two sample points within the proposed drill site the three wetland criteria were evaluated. Dominant individual plant species were identified, and their wetland indicator status was assessed (USFWS, 1988). Evidence of the hydrologic regime was collected and evaluated. A soil test pit was dug using a core auger to approximately 20 inches from the soil surface. Soil horizons were inspected and described using texture, soil color (Munsell, 1992), and moisture. Observations were recorded on the attached USACE Great Plains – Interim Version approved data sheet (Figures 2 – 3 depict the sample points).

PROJECT DESCRIPTION

Proposed temporary disturbance will include construction of a drill pad that is approximately 4.0 acres. Permanent disturbance will include fenced well heads located on the drill pad remnant. The existing tank battery will be expanded for this project.

SITE DESCRIPTION

The significant topographic feature in the vicinity of the site is the South Platte River that is located approximately 0.4 miles north of the project site (across US Highway 34). The Latham Ditch is located south of the hayfield. The proposed disturbance area is an irrigated hayfield immediately below the secondary terrace of the South Platte River that slopes gently north toward the river.

An east-west access road separates the corn field to the south from the irrigated hayfield to the north. The corn field is located on the secondary terrace; the hayfield is located on the primary terrace. Irrigation water from the ditch below the corn field flows through a culvert under the road to the hayfield. Water flows through a concrete lined ditch on the north side of the road into laterals that flow from south to north across the hayfield.

One soil map unit was identified in the area of the proposed project site. According to the Soil Survey of Weld County, Southern Part (1980), Aquolls and Aquent, gravelly substratum are located within the area. Aquolls and Aquent are comprised of deep, poorly drained soils formed in recent alluvium. No one pedon is typical. Surface layers are loamy or clayey and are underlain by sand or sand and gravel. These soils are listed as hydric by the U.S. Army Corps of Engineers (USACE, 1987). Soil sampling within the proposed disturbance area confirmed the presence of Aquolls and Aquent at Sample Points 001 and 002.

Plant species found at the sample points within the hayfield include three-square (*Scirpus americanus*), cordgrass (*Spartina pectinata*), orchardgrass (*Dactylis glomerata*), inland saltgrass (*Distichlis spicata*), and dandelion (*Taraxacum officinale*).

The landowner was irrigating the hayfield at the time of the investigation. Savage and Savage staff observed diverted flow from ditches above the hayfield to the east-west ditch feeding the laterals in the field. At Sample Point 001, water was present at 19” below the surface, while at Sample Point 002, the soil surface was inundated.

RESULTS/CONCLUSION

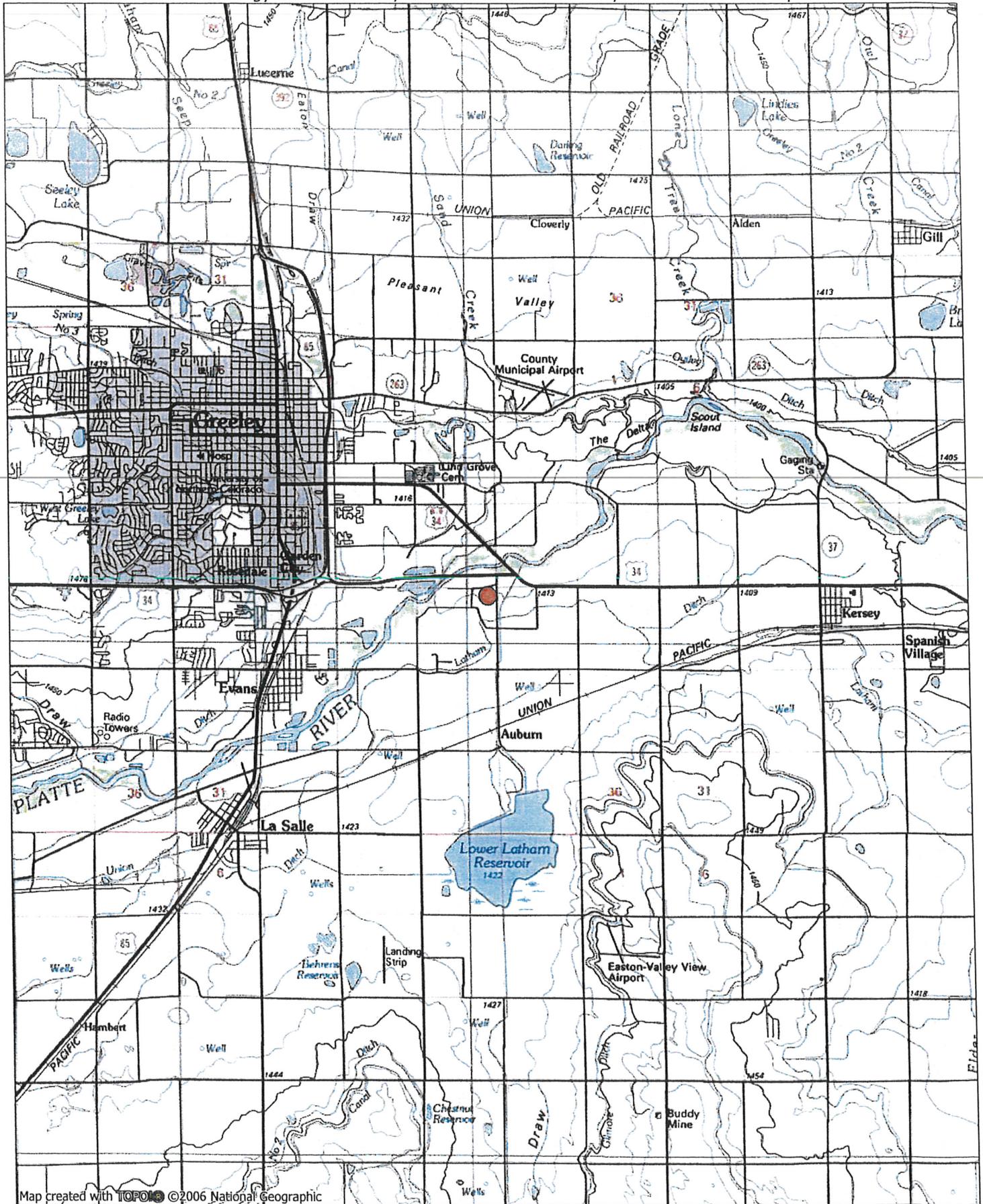
Savage and Savage conducted a wetland delineation at the proposed Noble Energy Lorenz F22-17, F22-18D, F23-31D drill pad on September 13, 2011. This delineation was conducted in order to determine the presence and extent of wetlands within the proposed drill site located within an irrigated hayfield. Hydrophytic vegetation, hydric soil, and wetland hydrology were identified within Sample Points 001 and 002. Vegetation, soils, and hydrology are consistent throughout the hayfield (Figure 4).

LITERATURE CITED

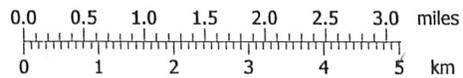
- Killmorgen Instruments Corp. 1992. Munsell® Soil Color Charts. Newburg, NW.
- Munshower, Frank F. 1991. Perennial Grasses for Revegetation of Disturbed Lands in the Northern Great Plains and the Intermountain Region. Reclamation Research Unit, Montana State University, Bozeman, Montana.
- U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi.
- U.S. Army Corps of Engineers. 2008. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region, ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble, ERDC/EL TR-08-12. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
-
- U.S. Department of Agriculture Soil Conservation Service. 1980. Soil Survey of Weld County, Colorado, Southern Part.
- U.S. Fish and Wildlife Service. 1988. National List of Plant Species that Occur in Wetlands: Central Plains (Region 5). U.S. Department of Interior, Fish and Wildlife Service Research and Project, Biological Report 88(26.5), Washington, D.C.

FIGURES

Noble Energy Lorenz F22-17, F22-18D & F23-31D Wells; General Location Map



Map created with TOPO! © 2006 National Geographic



TN MN
9 1/2°
09/15/11



**Figure 2. Lorenz F22-17, F22-18D, & F23-31D Sample Point 001.
Facing South (Secondary Terrace in Background)**



**Figure 3. Lorenz F22-17, F22-18D, & F23-31D Sample Point 002.
Facing South (Secondary Terrace in Background)**

Noble Energy Lorenz F22-17, F22-18D & F23-31D Well Site; Wetland Map



Irrigated Hay Field
Wetland

001 002

Co Rd 45

Data SIO: NOAA, U.S. Navy, NGA, GEBCO
Image © 2011 DigitalGlobe
© 2011 Google

Google

926 ft



APPENDIX

SOIL

Sampling Point: 001

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1"	7.5YR 2.5/1	95	N/A				CLAY W/DM MOIST	
1-19"	7.5YR 2.5/1	95	N/A				CLAY MOIST	
19-22"	7.5YR 4/1	90	7.5YR 4/4	5	CS	M	SAND ORGANIC STREAKING	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: GLEYING PRESENT IN A HORIZON.

HYDROLOGY

Wetland Hydrology Indicators:

<u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input type="checkbox"/> Water-Stained Leaves (B9)		

Field Observations:

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>19" after 5 minutes (vising)</u>	
Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: FLOOD IRRIGATED HAY FIELD. OWNER STATED IRRIGATED SINCE 1930'S. SOIL SURVEY MAP (1974) CONFIRMS FLOOD IRRIGATION AT THAT TIME.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: LORENZ F22-17, F22-18D, F23-31 City/County: WELD Sampling Date: SEPT 13, 2011
 Applicant/Owner: NOBLE ENERGY State: CO Sampling Point: 002
 Investigator(s): _____ Section, Township, Range: NE 1/4 SEC 22, T5N, R65W
 Landform (hillslope, terrace, etc.): 1° TERRACE, SLOPE Local relief (concave, convex, none): CONVEX Slope (%): 2
 Subregion (LRR): _____ Lat: 40.39053° N Long: 104.64222° W Datum: _____
 Soil Map Unit Name: AGGIOUS ± AQUEOUS, GRAVELLY SUBSTRATUM NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: <u>FIELD GETS WETTER AS MOVE EAST, STANDING H2O THIS SAMPLE POINT 165' EAST OF ROAD ON WEST SIDE OF FIELD DIVE EAST OF SAMPLE POINT 001</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>N/A</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (AB)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
HERBS				
Sapling/Herb Stratum (Plot size: <u>10' X 10'</u>)				
1. <u>Scirpus americanus</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Dactylis glomerata</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Dactylis spicata</u>	<u>2</u>	<u>N</u>	<u>NI(FAC)</u>	
4. <u>Taraxacum officinale</u>	<u>1</u>	<u>N</u>	<u>FACU</u>	
5. <u>Spartina pectinata</u>	<u>20</u>	<u>Y</u>	_____	
= Total Cover				
Herb Stratum (Plot size: <u>N/A</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
= Total Cover				
Woody Vine Stratum (Plot size: <u>N/A</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
= Total Cover				
% Bare Ground in Herb Stratum _____ = Total Cover				
1Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: _____				

SOIL

Sampling Point: 002

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		- Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-9"	7.5YR 2.5/1	95	N/A				CLAY	SATURATED
9-18"	7.5YR 4/1	90	7.5YR 4/4	5	CS	M	SAND	SATURATED

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: _____

HYDROLOGY

Wetland Hydrology Indicators:

<u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes No Depth (inches): 1"

Water Table Present? Yes No Depth (inches): 2"

Saturation Present? (includes capillary fringe) Yes No Depth (inches): SURFACE

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: _____