



# United States Department of the Interior

BUREAU OF INDIAN AFFAIRS  
Great Plains Regional Office  
115 Fourth Avenue S.E.  
Aberdeen, South Dakota 57401



IN REPLY REFER TO:  
DESCRM  
MC-208

MAR 04 2010

## MEMORANDUM

TO: Superintendent, Fort Berthold Agency

FROM: Regional Director, Great Plains Region 

SUBJECT: Environmental Assessment and Finding of No Significant Impact

In compliance with the regulations of the National Environmental Policy Act (NEPA) of 1969, as amended, for five proposed exploratory drilling wells by Zenergy Operating Company LLC, on Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H, Dakota-3 Stevenson #15-8H and Dakota-3 KYW #27-34H on the Fort Berthold Reservation, an Environmental Assessment (EA) has been completed and a Finding of No Significant Impact (FONSI) has been issued.

All the necessary requirements of the National Environmental Policy Act have been completed. Attached for your files is a copy of the EA, FONSI and Notice of Availability. The Council on Environmental Quality (CEQ) regulations require that there be a public notice of availability of the FONSI (1506.6(b)). Please post the attached notice of availability at the Agency and Tribal buildings for 30 days.

If you have any questions, please call Marilyn Bercier, Regional Environmental Scientist, Division of Environment, Safety and Cultural Resources Management, at (605) 226-7656.

Attachment

cc: Marcus Levings, Chairman, Three Affiliated Tribes (with attachment)  
Perry "No Tears" Brady, Tribal Historic Preservation Officer (with attachment)  
Roy Swalling, Bureau of Land Management (with attachment)  
Jonathon Shelman, Corps of Engineers (with attachment)

## **Finding of No Significant Impact Zenergy Operating Company, LLC**

### **Five Bakken Exploratory Oil Wells: Dakota-3 Black Hawk #15-34H Dakota-3 Rubia #16-24H Dakota-3 Beaks #36-35H Dakota-3 Stevenson #15-8H Dakota-3 KYW #27-34H Fort Berthold Indian Reservation Dunn and McKenzie County, North Dakota**

The U.S. Bureau of Indian Affairs (BIA) has received a proposal for five oil/gas wells, access roads and related infrastructure on the Fort Berthold Indian Reservation to be located in Section 34, Township (T) 149 North (N), Range (R) 92 West (W), Dunn County, North Dakota; Section 24, T149N, R93W, McKenzie County, North Dakota; Section 36, T149N, R93W, Dunn County, North Dakota; Section 8, T149N, R94W, McKenzie County, North Dakota and Section 27, T150N, R94W, McKenzie County, North Dakota. Associated federal actions by BIA include determinations of effect regarding cultural resources, approvals of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Applications for Permit to Drill.

The potential of the proposed actions to impact the human environment is analyzed in the attached Environmental Assessment (EA), as required by the National Environmental Policy Act. Based on the recently completed EA, I have determined that the proposed projects will not significantly affect the quality of the human environment. No Environmental Impact Statement is required for any portion of the proposed activities.

This determination is based on the following factors:

1. Agency and public involvement was solicited and environmental issues related to the proposal were identified.
2. Protective and prudent measures were designed to minimize impacts to air, water, soil, vegetation, wetlands, wildlife, public safety, water resources, and cultural resources. The remaining potential for impacts was disclosed for both the proposed action and the No Action alternative.
3. Guidance from the U.S. Fish and Wildlife Service has been fully considered regarding wildlife impacts, particularly in regard to threatened or endangered species.
4. The proposed actions are designed to avoid adverse effects to historic, archaeological, cultural and traditional properties, sites and practices. Compliance with the procedures of the National Historic Preservation Act is complete.
5. Environmental justice was fully considered.
6. Cumulative effects to the environment are either mitigated or minimal.
7. No regulatory requirements have been waived or require compensatory mitigation measures.
8. The proposed projects will improve the socio-economic condition of the affected Indian community.

  
\_\_\_\_\_  
Regional Director

3/4/10  
\_\_\_\_\_  
Date

# **ENVIRONMENTAL ASSESSMENT**

**United States Department of Interior  
Bureau of Indian Affairs**

**Great Plains Regional Office  
Aberdeen, South Dakota**

**Cooperating Agency:**

**Bureau of Land Management**

**North Dakota State Office  
Dickinson, North Dakota**



**Zenergy Operating Company, LLC**

**Five Bakken Formation Exploratory Oil Wells:**

**Dakota-3 Black Hawk #15-34H**

**Dakota-3 Rubia #16-24H**

**Dakota-3 Beaks #36-35H**

**Dakota-3 Stevenson #15-8H**

**Dakota-3 KYW #27-34H**

**Fort Berthold Indian Reservation**

**March 2010**

For information contact:

Bureau of Indian Affairs, Great Plains Regional Office  
Division of Environment, Safety and Cultural Resources Management  
115 4th Avenue SE, Aberdeen, South Dakota 57401 (605) 226-7656

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## **1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION**

### **1.1 INTRODUCTION**

Zenergy Operating Company, LLC (Zenergy) has acquired the leases and is proposing to drill five horizontal oil and gas wells on the Fort Berthold Indian Reservation (Reservation) to evaluate and possibly develop the commercial potential of natural resources. Developments have been proposed on lands held in trust by the United States in Dunn and McKenzie counties, North Dakota. The Bureau of Indian Affairs (BIA) is the surface management agency for potentially affected tribal lands and individual allotments. The BIA manages lands held in title by the tribe and tribal members to subsurface mineral rights. Developments have been proposed in locations that target specific areas in the Middle Bakken Dolomite member of the Bakken Formation, a known oil reserve. The following proposed well sites, shown in Figures 1 through 6, will be located within the Reservation where the majority of the external boundaries are located above the Bakken Formation.

- **Dakota-3 Black Hawk #15-34H:** SE¼ SE¼ of Section 34, Township (T) 149 North (N), Range (R) 92 West (W), Dunn County, North Dakota
- **Dakota-3 Rubia #16-24H:** SE¼ SE¼ of Section 24, T149N, R93W, McKenzie County, North Dakota
- **Dakota-3 Beaks #36-35H:** SE¼ NE¼ of Section 36, T149N, R93W, Dunn County, North Dakota
- **Dakota-3 Stevenson #15-8H:** SW¼ SE¼ of Section 8, T149N, R94W, McKenzie County, North Dakota
- **Dakota-3 KYW #27-34H:** SW¼ NW¼ of Section 27, T150N, R94W, McKenzie County, North Dakota

Existing access roads will be upgraded and new access roads will be constructed to facilitate the construction and operation of each proposed well. Well pads will be constructed to accommodate drilling activities and well operations. Pits constructed for drilled cuttings will be used during drilling operations and reclaimed once operations have ceased. Should any of the proposed well sites result in long-term commercial production, supporting facilities may be constructed on site. All components (e.g., roads, well pads, supporting facilities) will be reclaimed upon final abandonment unless formally transferred with federal approval to either the BIA or the landowner. The proposed wells are exploratory; should they prove productive, further exploration of surrounding areas is possible. This environmental assessment (EA) addresses the potential impacts associated with the construction and possible long-term operation of the above-listed wells and directly related infrastructure and facilities. Further oil and gas exploration and development will require additional National Environmental Policy Act (NEPA) analysis and federal actions.

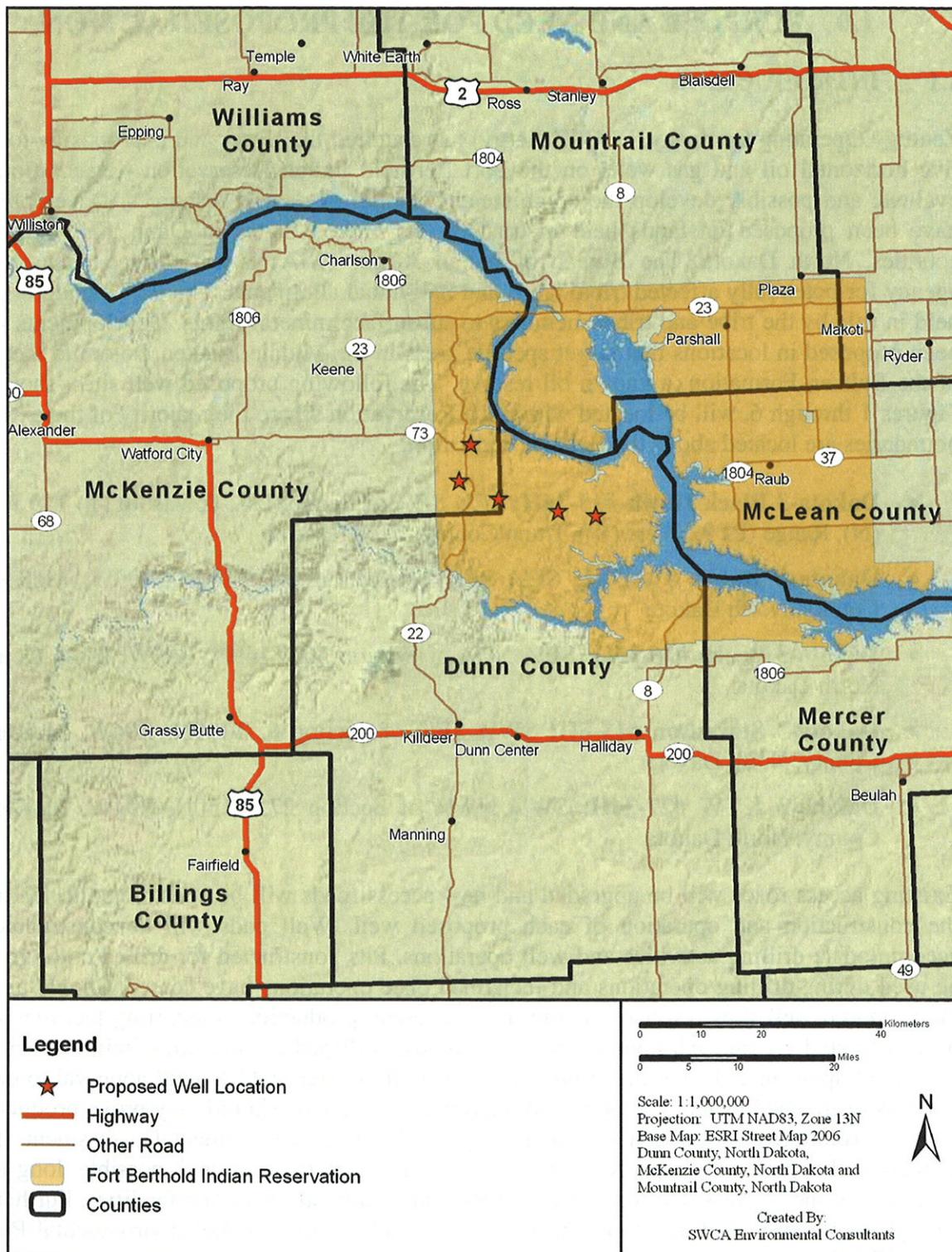


Figure 1. Project locations.

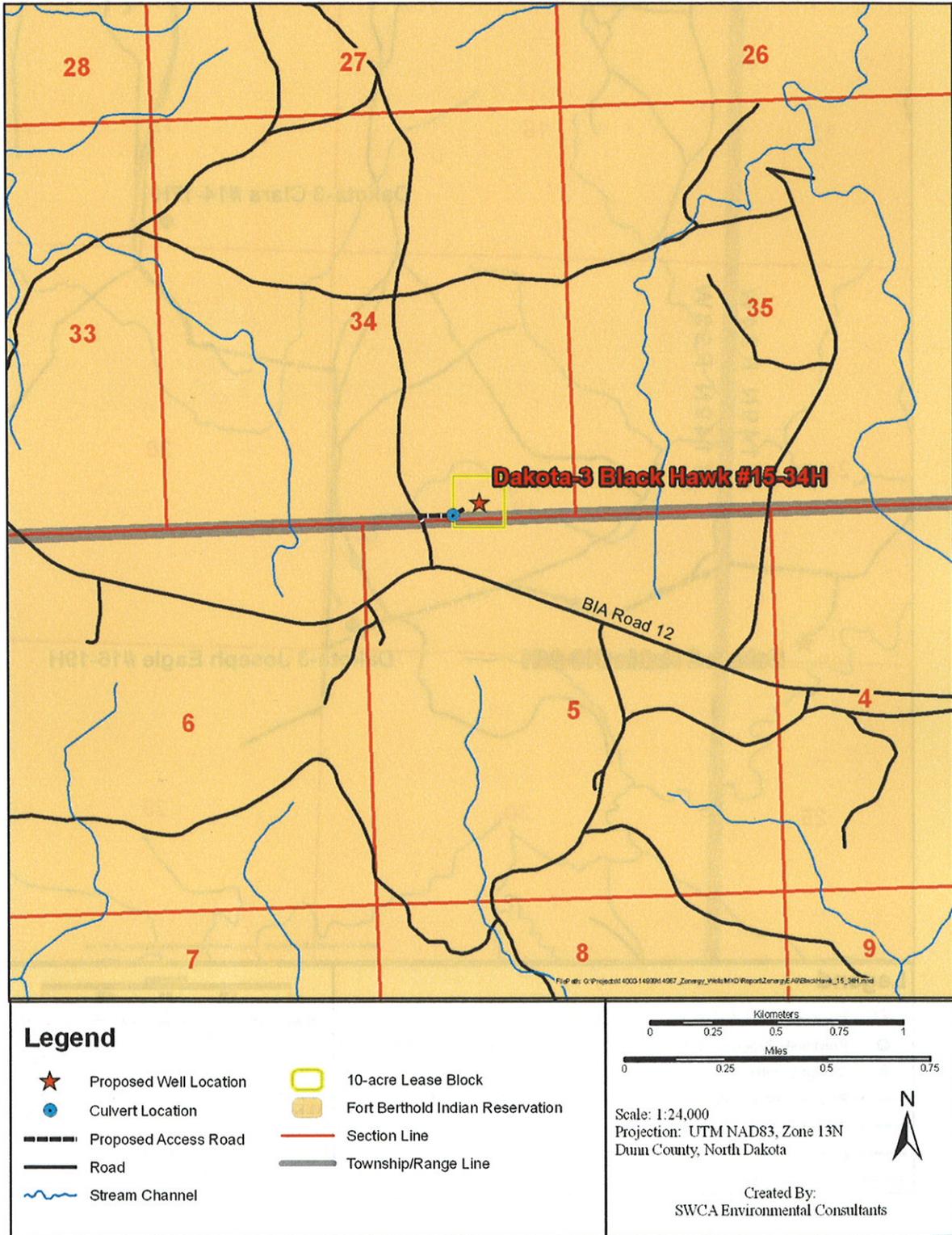
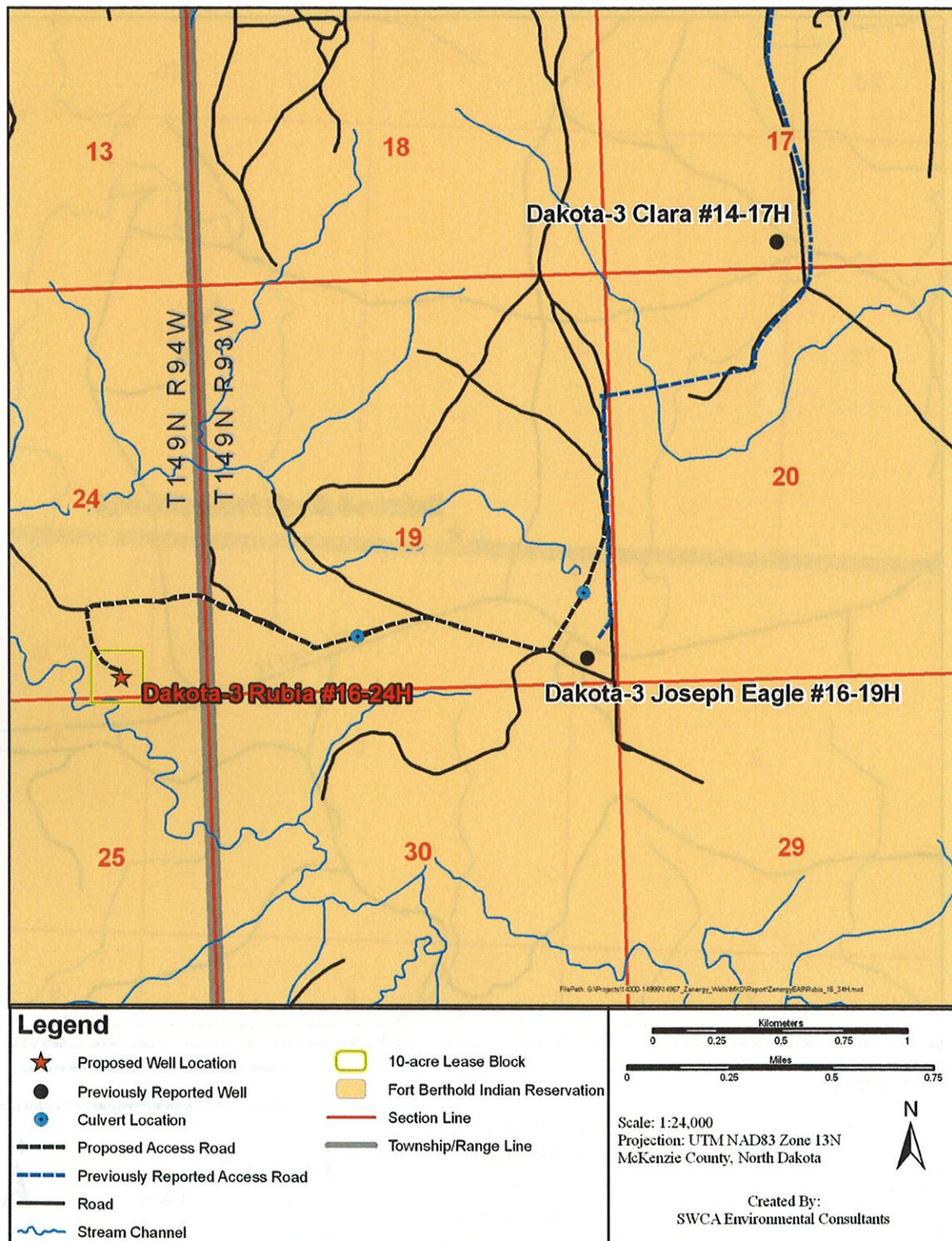


Figure 2. Dakota-3 Black Hawk #15-34H proposed location.



**Figure 3. Dakota-3 Rubia #16-24H proposed location.**

*(Although other roads appear available for use in the area, the operating company and BIA agreed that this would be the best route for this access road.)*

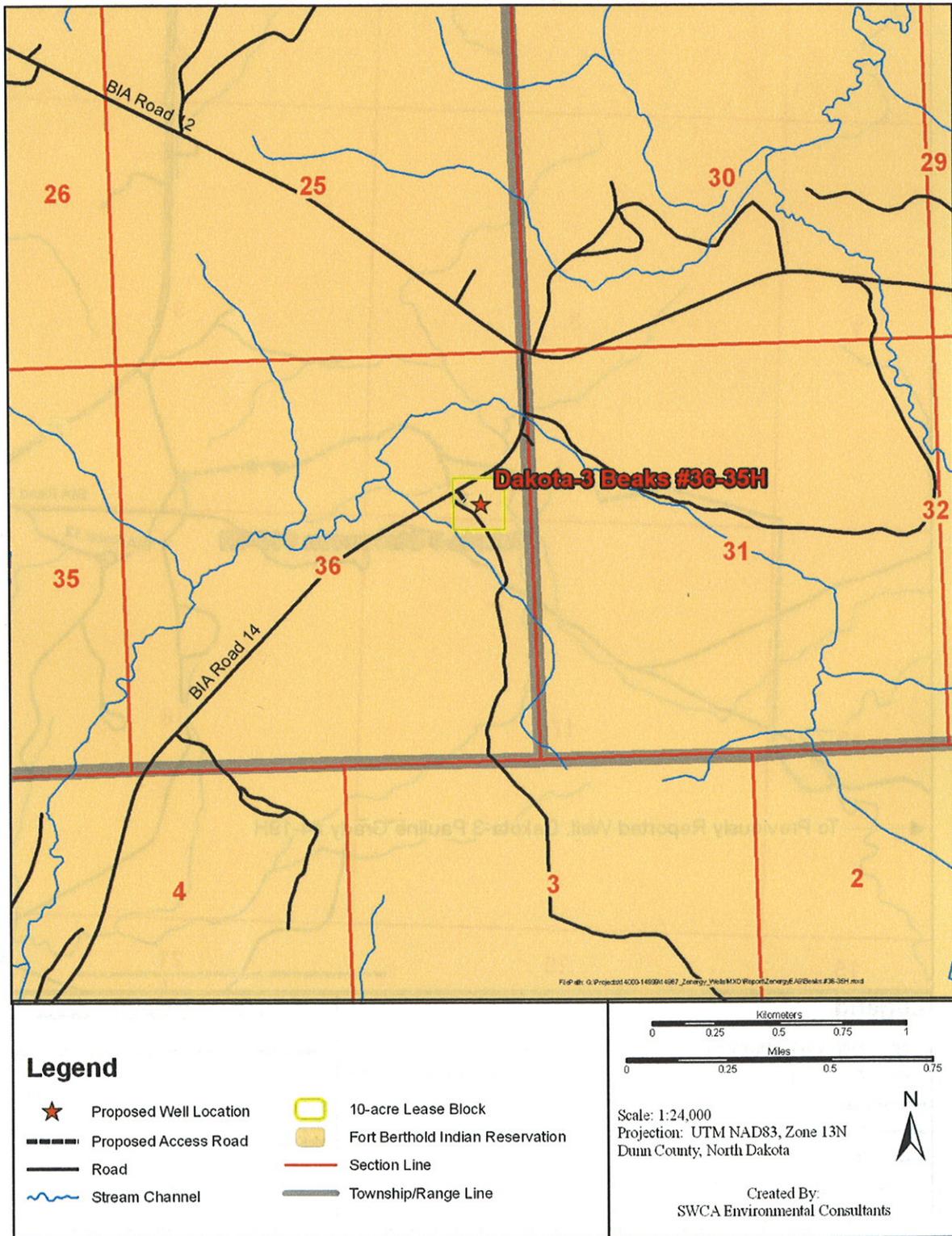


Figure 4. Dakota-3 Beaks #36-35H proposed location.

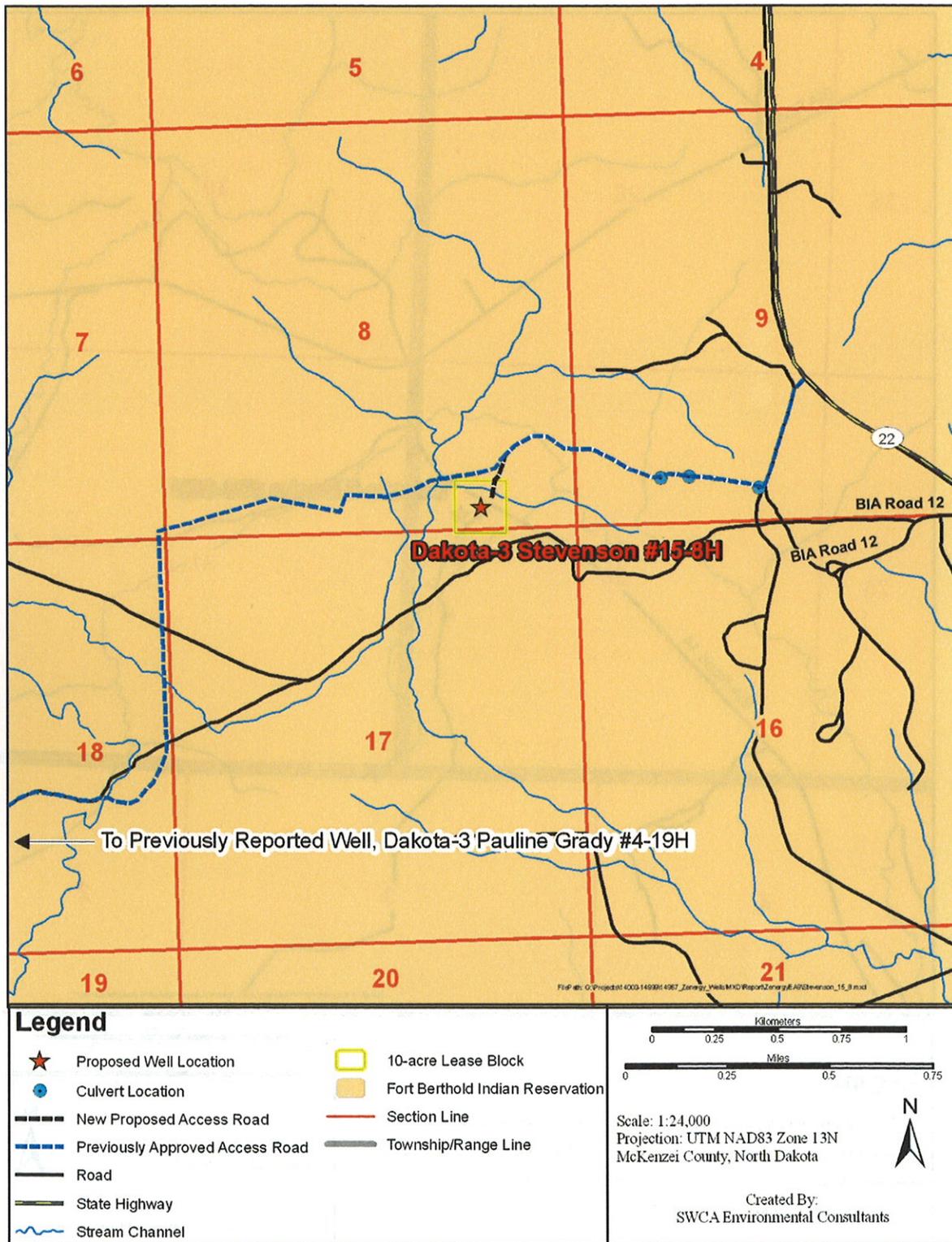


Figure 5. Dakota-3 Stevenson #15-8H proposed location.

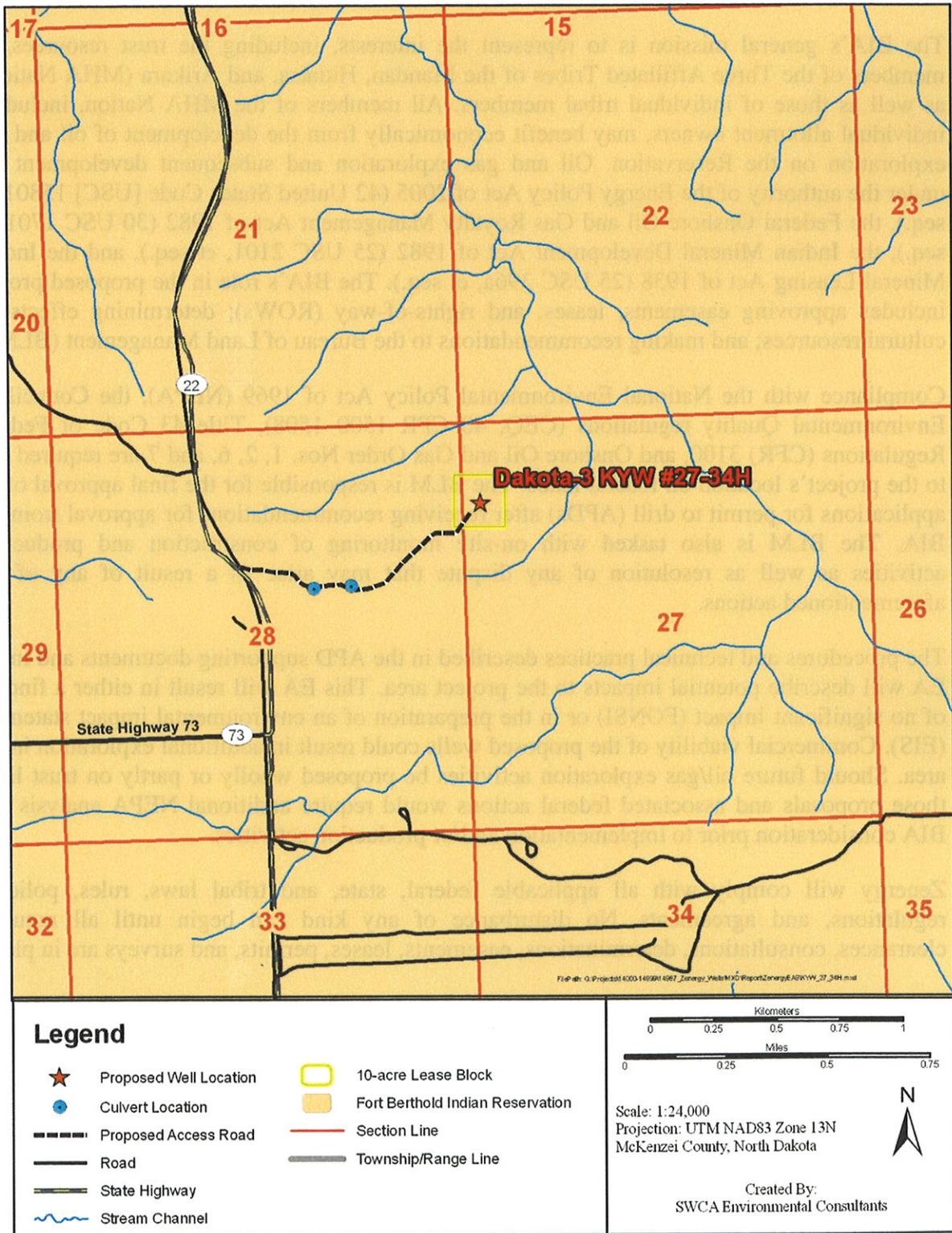


Figure 6. Dakota-3 KYW #27-34H proposed location.

## **1.2 FEDERAL AND OTHER RELEVANT REGULATIONS AND AUTHORITIES**

The BIA's general mission is to represent the interests, including the trust resources, of members of the Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara (MHA Nation), as well as those of individual tribal members. All members of the MHA Nation, including individual allotment owners, may benefit economically from the development of oil and gas exploration on the Reservation. Oil and gas exploration and subsequent development are under the authority of the Energy Policy Act of 2005 (42 United States Code [USC] 15801, et seq.), the Federal Onshore Oil and Gas Royalty Management Act of 1982 (30 USC 1701, et seq.), the Indian Mineral Development Act of 1982 (25 USC 2101, et seq.), and the Indian Mineral Leasing Act of 1938 (25 USC 396a, et seq.). The BIA's role in the proposed project includes approving easements, leases, and rights-of-way (ROWs); determining effects on cultural resources; and making recommendations to the Bureau of Land Management (BLM).

Compliance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality regulations (CEQ, 40 CFR 1500–1508), Title 43 Code of Federal Regulations (CFR) 3100, and Onshore Oil and Gas Order Nos. 1, 2, 6, and 7 are required due to the project's location on federal lands. The BLM is responsible for the final approval of all applications for permit to drill (APDs) after receiving recommendations for approval from the BIA. The BLM is also tasked with on-site monitoring of construction and production activities as well as resolution of any dispute that may arise as a result of any of the aforementioned actions.

The procedures and technical practices described in the APD supporting documents and in the EA will describe potential impacts to the project area. This EA will result in either a finding of no significant impact (FONSI) or in the preparation of an environmental impact statement (EIS). Commercial viability of the proposed wells could result in additional exploration in the area. Should future oil/gas exploration activities be proposed wholly or partly on trust land, those proposals and associated federal actions would require additional NEPA analysis and BIA consideration prior to implementation and/or production activities.

Zenergy will comply with all applicable federal, state, and tribal laws, rules, policies, regulations, and agreements. No disturbance of any kind can begin until all required clearances, consultations, determinations, easements, leases, permits, and surveys are in place.

## **2.0 PROPOSED ACTION AND THE NO ACTION ALTERNATIVE**

The BIA, as directed by NEPA, must “study, develop, and describe appropriate alternatives to the recommended course of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources...” (NEPA Sec 102[2][e]). Developing a range of alternatives allows for exploration of options designed to meet the purpose and need for the action. Along with the No Action Alternative, the BIA is considering the Proposed Action.

### **2.1 THE NO ACTION ALTERNATIVE**

Under the No Action Alternative, the proposed project (including well pads, wells, and access roads) would not be constructed, drilled, installed, or operated. The BIA would not approve easements, leases, or ROWs for the proposed locations and the BLM would not approve the APD. No impacts would occur as a result of this project to the following critical elements: air quality, public health and safety, water resources, wetland/riparian habitat, threatened and endangered species, soils, vegetation and invasive species, cultural resources, socioeconomic conditions, and environmental justice. There would be no project-related ground disturbance, use of hazardous materials, or trucking of product to collection areas. Surface disturbance, deposition of potentially harmful biological material, and traffic levels would not change from present levels. Under the No Action Alternative, the MHA Nation, tribal members, and allottees would not have the opportunity to realize potential financial gains from the discovery and resulting development of resources at these well locations.

### **2.2 THE PROPOSED ACTION**

This document analyzes the potential impacts of five exploratory oil and gas wells with varied surface and mineral estates located in the west-central portions of the Reservation in Dunn and McKenzie counties. Sites were chosen by Zenergy in consultation with tribal and BIA resource managers to provide information for future development. Well site locations underwent a pre-clearance process that included surveys for cultural, archaeological, and natural (i.e., biological and physical) resources. The proposed wells would test the commercial potential of the Middle Bakken Dolomite Member of the Bakken Formation.

#### **2.2.1 Field Camps**

A few personnel would be housed in self-contained trailers for a very short period of time. Long-term housing is not being proposed. Most personnel, both construction and drilling, would commute to the site. Human waste would be collected on-site in portable toilets and trailers and it would be transported off site to a state-approved wastewater treatment facility. All other solid waste would be contained in enclosed containers and transported to, and disposed of at state-approved facilities.

## **2.2.2 Access Roads**

### **2.2.2.1 Access Roads**

Up to 11,886 feet (i.e., 2.3 miles) of new access roads would be constructed. A maximum disturbed ROW width of 66 feet for each access road would result in up to 18 acres of new surface disturbance. Signed agreements would be in place allowing road construction across affected private and allotted land surfaces, and any applicable approach permits and/or easements would be obtained prior to any construction activity.

Construction would follow road design standards outlined in the BLM Gold Book (BLM and U.S. Forest Service [USFS] 2007). At a minimum, 6 inches of topsoil would be removed from the access road corridors. This stockpiled topsoil would then be placed on the outside slopes of the ditches following road construction. The ditches would be reseeded as quickly as possible using a seed mixture determined by the BIA. Care would be taken during road construction to avoid disturbing or disrupting any buried utilities that may exist along State Highway 22 and BIA Roads 12 and 14. The access roads would be surfaced with a minimum of 4 inches of aggregate if the site were to be established as a commercial production site. Also, the roadway would remain in use for the life of the well(s). Details of road construction are addressed in the APD. A diagram of typical road cross sections is shown in Figure 7.

## **2.2.3 Well Pads**

The proposed well pads would include a leveled area (pad) and a pit. The pad would be used for the drilling rig and equipment, and the pit would be excavated, lined, and used for drilling fluids and cuttings, **except for the Dakota-3 Rubia #16-24H site, which would utilize a closed loop system.** The pad would be stripped of topsoil and vegetation and then graded. The topsoil would be stockpiled and stabilized with a cover crop until it could be used to reclaim and revegetate the disturbed area. The subsoils would be used in the construction of the pad and the finished pads would be graded to ensure that water drains away from the pad. Erosion control best management practices (BMPs) would be implemented and could include surface drainage controls, soil surface protection methodologies, and sediment capture features.

The well pads average approximately 430 by 330 feet (3.3 acres per well pad). Cut-and-fill slopes, stockpiled topsoil, and reserve pit backfill placed on the edge of the pads would result in approximately 0.4 acre of additional surface disturbance per pad. Total surface disturbance would average approximately 3.7 acres per well pad and would total 18.5 acres. Details of pad construction and reclamation can be found in the APD.

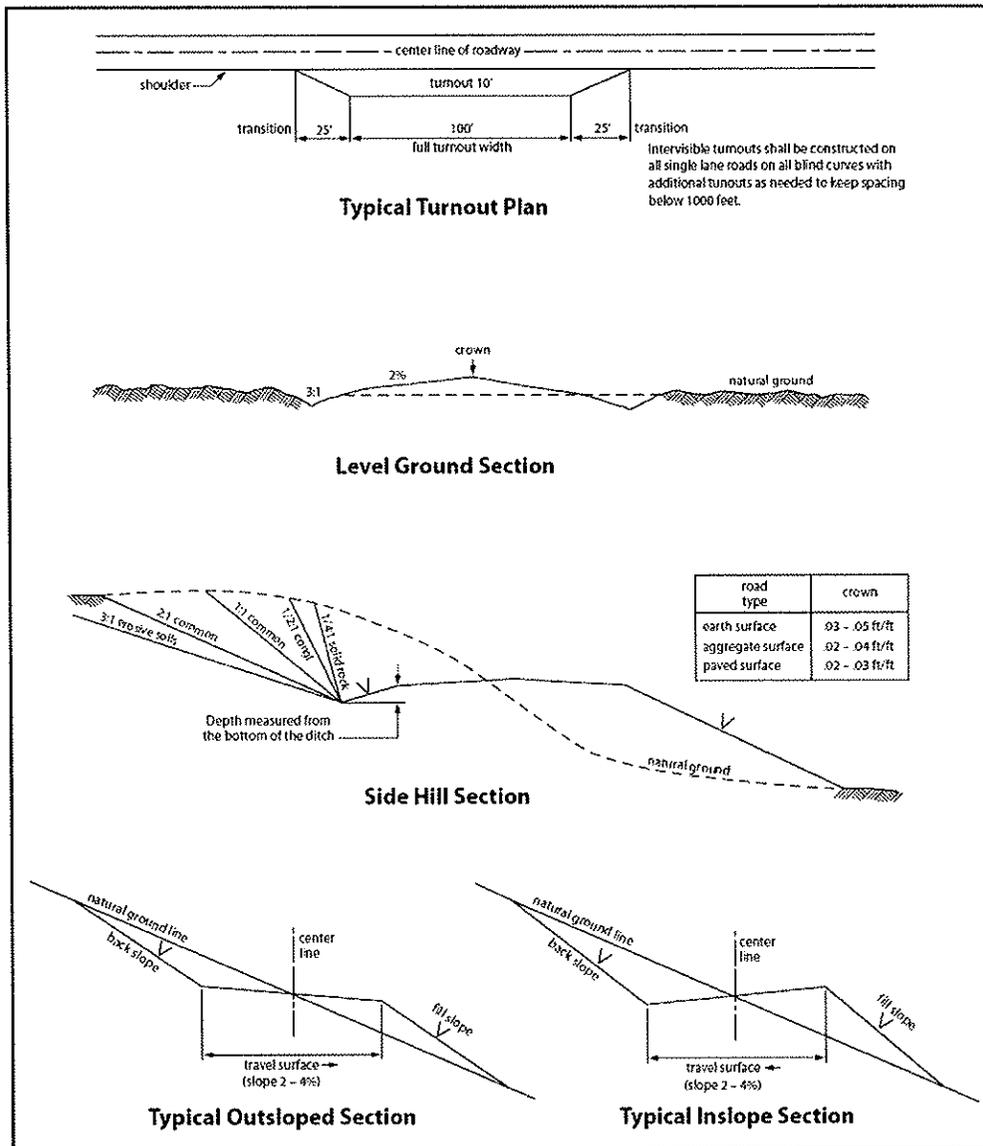


Figure 7. Typical road cross sections (BLM and USFS 2007).

#### 2.2.4 Drilling

After securing mineral leases, Zenergy submitted the APDs to the BLM on the following dates:

- Dakota-3 Black Hawk #15-34H: 12/30/09
- Dakota-3 Rubia #16-24H: 12/30/09
- Dakota-3 Beaks #36-35H: 12/30/09
- Dakota-3 Stevenson #15-8H: 12/30/09
- Dakota-3 KYW #27-34H: 12/30/09

The BIA's office in New Town, North Dakota, received copies of the APD from the BLM North Dakota Field Office. Construction will begin when the BIA completes the NEPA process and the APDs are then approved by the BLM.

Rig transport and on-site assembly would take roughly seven days for each well; a typical drill rig is shown in Figure 8. Drilling would require approximately 35 days to reach target depth, using a rotary drilling rig rated for drilling to approximately 15,000 feet. For the first 2,500 feet drilled, a freshwater-based mud system with non-hazardous additives would be used to minimize contaminant concerns. Water would be obtained from a commercial source for this drilling stage, using approximately 8.4 gallons of water per foot of hole drilled.

After setting and cementing the near-surface casing, an oil-based mud system (80% to 85% diesel fuel and 15% to 20% water) would be used to drill to a 7-inch casing point. Oil-based drilling fluids reduce the potential for hole sloughing while drilling through water-sensitive formations (shales). Approximately 4,720 gallons of water and 18,900 gallons of diesel fuel per well would be used to complete vertical drilling. The lateral reach of the borehole would be drilled using 33,600 gallons of fresh water as mud and adding polymer sweeps as necessary to clean the hole.



**Figure 8. Typical drilling rig (Ruffo 2009).**

### **2.2.5 Casing and Cementing**

Surface casing would be set at an approximate depth of 2,500 feet and cemented back to the surface during drilling, isolating all near-surface freshwater aquifers in the project area. The Fox Hills Formation and Pierre Formation would be encountered at depths of approximately

1,700 and 1,800 feet, respectively. Production casing would be cemented from approximately 11,256 feet deep to a depth of about 4,000 feet in order to isolate the hydrocarbon zone present in the Dakota Formation below a depth of 4,500 feet. Casing and cementing operations would be conducted in full compliance with Onshore Oil and Gas Order No. 2 (43 CFR 3160).

### **2.2.6 Completion Activities**

A completion rig unit would be moved on-site following the conclusion of drilling and casing activities. Approximately 30 days is usually required, at the proposed well depths, to clean out the well bore, pressure test the casing, perforate and fracture the horizontal portion of the hole, and run production tubing for commercial production. The typical procedure for fracturing a target formation to increase production includes pumping a mixture of sand and a carrier (e.g., water and/or nitrogen) downhole under extreme pressure. The resulting fractures are propped open by the sand, increasing the capture zone of the well and subsequently maximizing the efficient drainage of the field. After fracturing, the well is “flowed back” to the surface where fracture fluids are recovered and disposed of in accordance with North Dakota Industrial Commission (NDIC) rules and regulations.

### **2.2.7 Commercial Production**

If drilling, testing, and production support commercial production from any of the five proposed locations, additional equipment would be installed, including a pumping unit at the well head, a vertical heater/treater, tanks (usually 400-barrel steel tanks), and a flare pit (Figure 9). An impervious dike sized to hold 100% of the capacity of the largest tank plus one full day’s production would surround the tanks and the heater/treater. Load out lines would be located inside the diked area, and a heavy screen-covered drip barrel would be installed under the outlet. A metal access staircase would protect the dike and support flexible hoses used by tanker trucks. For all above-ground facilities not subject to safety requirements, the BIA would choose a paint color recommended by the BLM or the Rocky Mountain Five-State Interagency Committee, which would blend with the natural color of the landscape. Commercial production would be discussed more fully in subsequent NEPA analyses.

Initially, oil would be collected in tanks and periodically trucked to an existing oil terminal for sales. Any produced water would be captured in tanks and periodically trucked to an approved disposal site. The frequency of trucking activities for both oil and produced water would depend upon volumes and rates of production. The duration of production operations cannot be reliably predicted, but some oil wells have pumped for more than 100 years. The operator estimates that each well would yield approximately 500 barrels of oil per day and 50 barrels of water during the first year of production. After the first year, the operator estimates production would decrease to approximately 250 barrels of oil per day and 25 barrels of water. Produced water is mostly recovered frac fluids and is expected to become minimal after two years. In the future, Zenergy would complete a ROW application for oil and water pipelines and for an electric line, all of which would be located within existing disturbance along access and arterial roads.



**Figure 9. Typical producing oil well pad (Sobotka 2008).**

Large volumes of gas are not expected from these locations. Small volumes would be flared in accordance with Notice to Lessees (NTL) 4A and adopted NDIC regulations, which prohibit unrestricted flaring for more than the initial year of operation (North Dakota Century Code [NDCC] 38-08-06.4).

## **2.2.8 Construction Details at Individual Sites**

### **2.2.8.1 Dakota-3 Black Hawk #15-34H**

The proposed Dakota-3 Black Hawk #15-34H well site, shown in Figure 10, is located approximately 11.95 miles southeast of Mandaree in the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 34, T149N, R92W, Dunn County, North Dakota. A new access road approximately 792 feet long would be constructed from BIA 12 to the well site (Figure 11). The new road would disturb approximately 1.2 acres and the proposed well pad would disturb approximately 3.7 acres; the total anticipated new disturbance would be 4.9 acres.

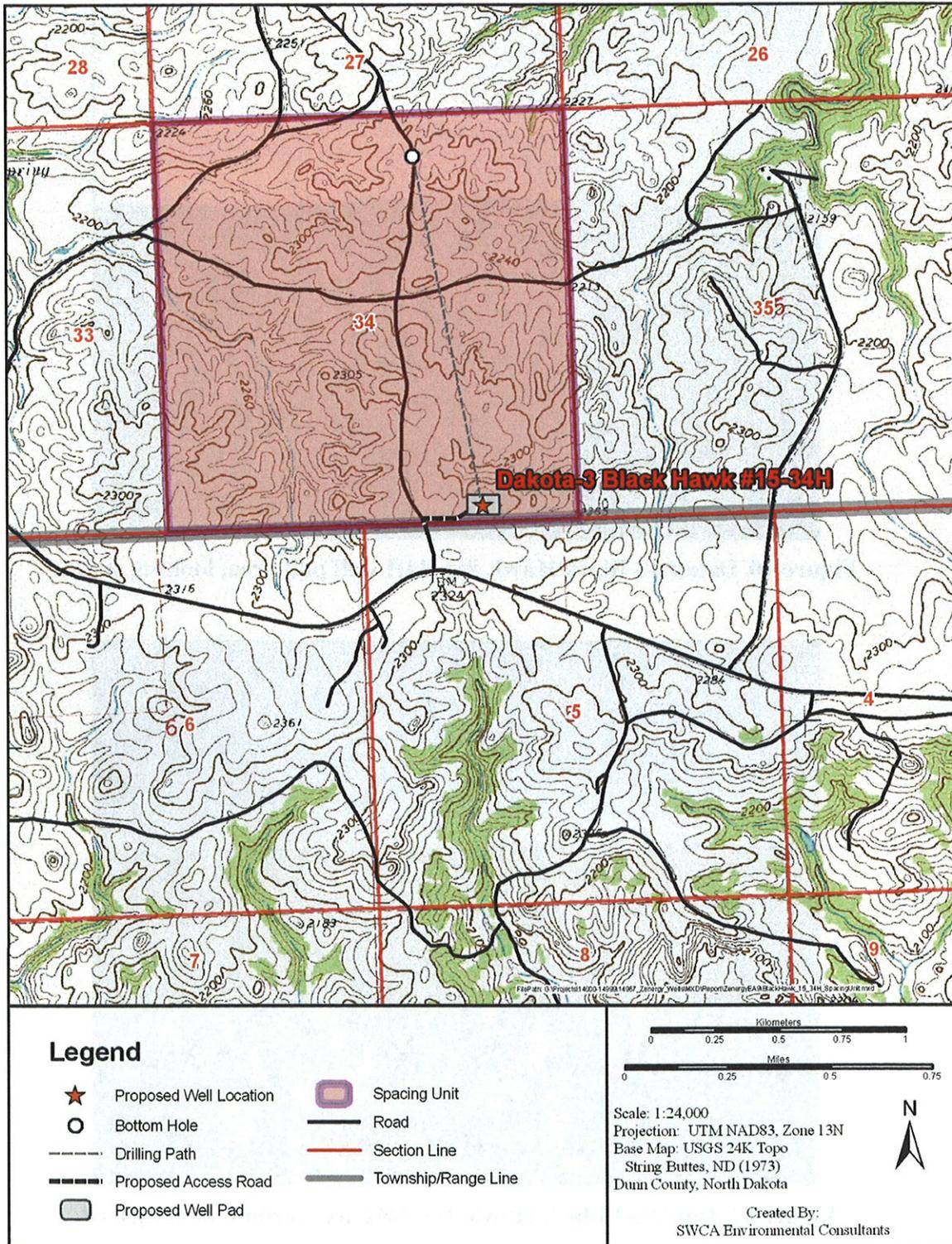
The spacing unit consists of 640 acres (+/-) with the bottom hole located in the NW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 34, T149N, R92W (Figure 12). Vertical drilling would be completed at approximately 9,921 feet, at which point drilling would turn roughly horizontal to an approximate total vertical depth (TVD) of 10,471 feet and total measured depth (TMD) 10,771 feet. The complete drilling string would measure approximately 15,270 feet, including approximately 4,500 to 5,000 feet of lateral reach into the Middle Bakken Formation. The drilling target is located approximately 550 feet from the north line (FNL) and 1,980 feet from the east line (FEL), approximately 4,591 feet northwest of the surface hole location. A setback of at least 500 feet would be maintained.



**Figure 10. Dakota-3 Black Hawk #15-34H well pad area, looking south.**



**Figure 11. Dakota-3 Black Hawk #15-34H access road, looking east.**



**Figure 12. Dakota-3 Black Hawk #15-34H proposed location showing spacing unit and drilling target.**

2.2.8.2 Dakota-3 Rubia #16-24H

The proposed Dakota-3 Rubia #16-24H well site, shown in Figure 13, is located approximately 2.22 miles southeast of Mandaree in the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 24, T149N, R94W, McKenzie County, North Dakota. The access road will follow the previously permitted Dakota-3 Clara #14-17H access road for approximately 3,168 feet from BIA 12 to the previously permitted Dakota-3 Joseph Eagle #16-19H access road. It will then follow the Dakota-3 Joseph Eagle #16-19H access road for 5,280 feet. A new access road (Figure 14) approximately 6,864 feet long would be constructed from the Dakota-3 Joseph Eagle #16-19H access road to the well location. The new road would disturb approximately 10.4 acres and the proposed well pad would disturb approximately 3.7 acres, bringing the total anticipated new disturbance to 14.1 acres.

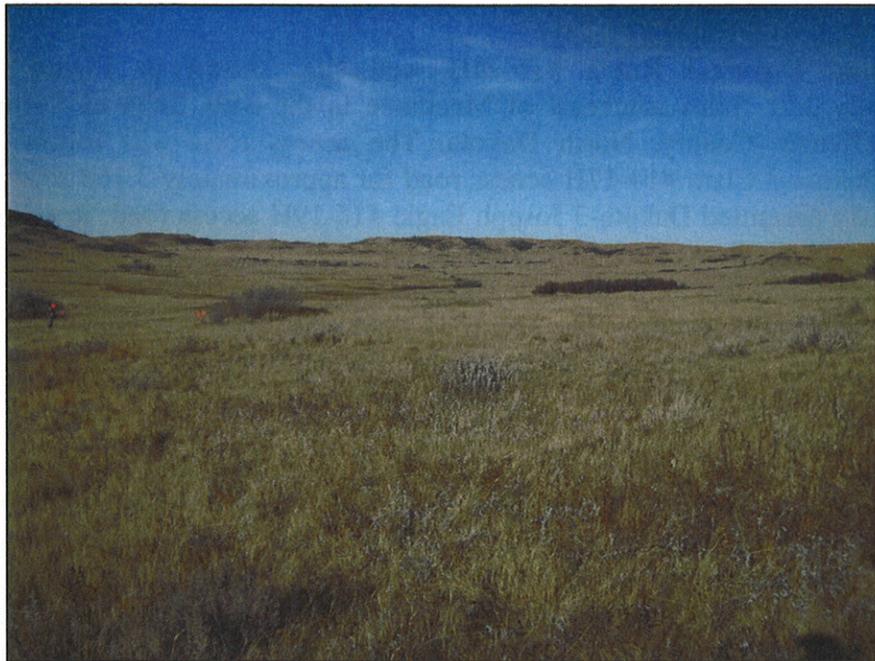
The spacing unit consists of 640 acres (+/-) with the bottom hole located on the dividing line of the NW $\frac{1}{4}$  NE $\frac{1}{4}$  and NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 24, T149N, R94W (Figure 15). Vertical drilling would be completed at approximately 10,225 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,775 feet and TMD of 11,075 feet. The complete drilling string would measure approximately 15,575 feet, including approximately 4,500 to 5,000 feet of lateral reach into the Middle Bakken Formation. The drilling target is located approximately 550 feet FNL and 1,320 feet FEL, approximately 4,381 feet north-northwest of the surface hole location. A setback of at least 500 feet would be maintained.

The Dakota-3 Rubia #16-24H well will use a modified closed loop system due to its close proximity to Squaw Creek. Drilling fluids will be contained in tanks on location. Also, cuttings will be contained in a tank and hauled to an approved disposal facility. Only an emergency pit will be on location.

2.2.8.3 Dakota-3 Beaks #36-35H

The proposed Dakota-3 Beaks #36-35H well site, shown in Figure 16, is located approximately 8.11 miles southeast of Mandaree in the SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 36, T149N, R93W, Dunn County, North Dakota. A new access road (Figure 17) approximately 180 feet long would be constructed from BIA 14 and connect to the well location. The new road would disturb approximately 0.3 acre and the proposed well pad would disturb approximately 3.7 acres, bringing the total anticipated new disturbance to 4.0 acres.

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located on the dividing line of the NW $\frac{1}{4}$  NW $\frac{1}{4}$  and SW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 35, T149N, R93W (Figure 18). Vertical drilling would be completed at approximately 9,921 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,471 feet and TMD of 10,771 feet. The complete drilling string would measure approximately 17,771 feet, including approximately 7,000 to 8,000 feet of lateral reach into the Middle Bakken Formation. The drilling target is located about 1,320 feet FNL and 550 feet from west line (FWL), approximately 9,412 feet west-northwest of the surface hole location. A setback of at least 500 feet would be maintained.



**Figure 13. Dakota-3 Rubia #16-24H well pad area, looking west.**



**Figure 14. Dakota-3 Rubia #16-24H access road, looking north.**

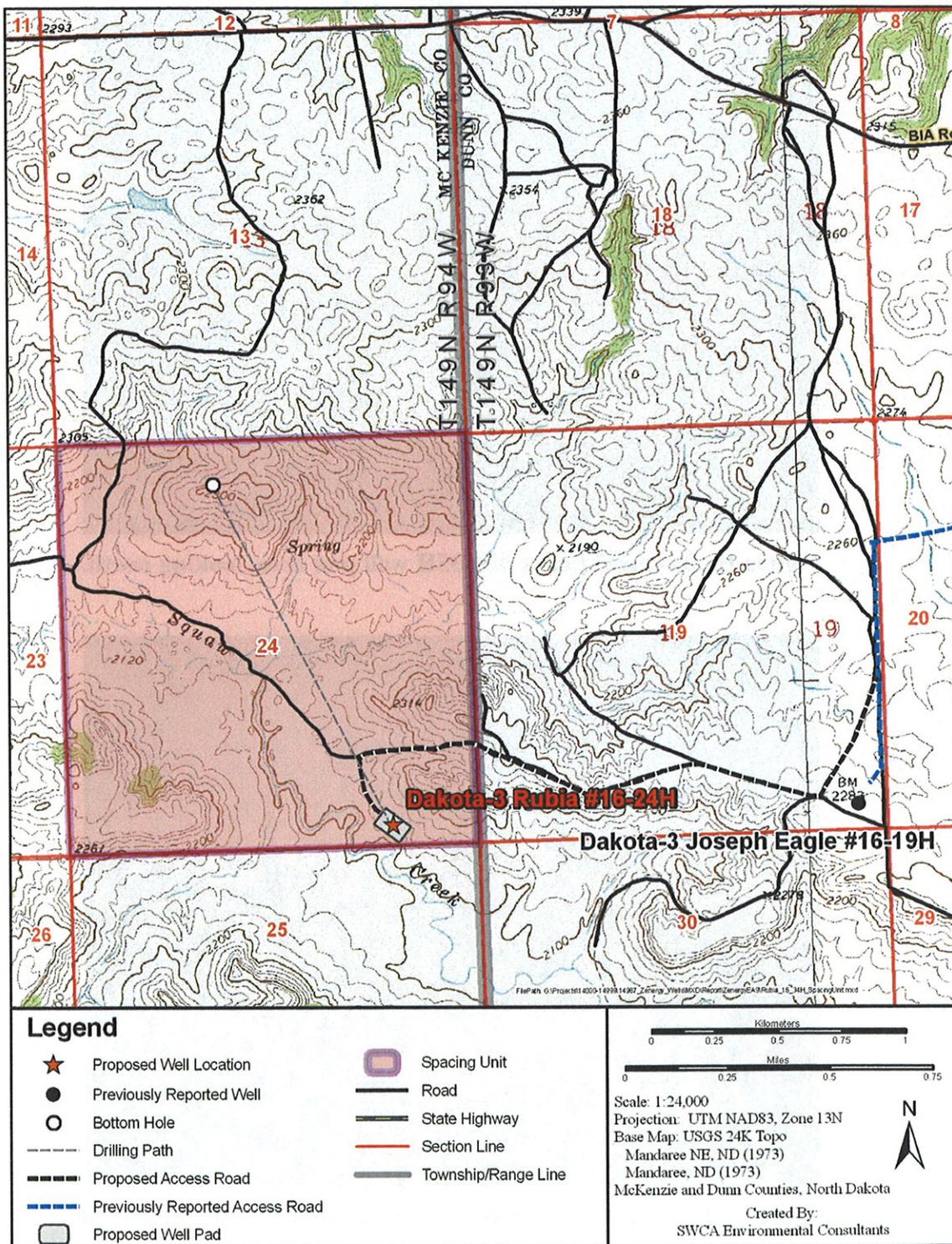


Figure 15. Dakota-3 Rubia #16-24H proposed location showing spacing unit and drilling target.



**Figure 16. Dakota-3 Beaks #36-35H well pad area, looking north.**



**Figure 17. Dakota-3 Beaks #36-35H access road area, looking west.**

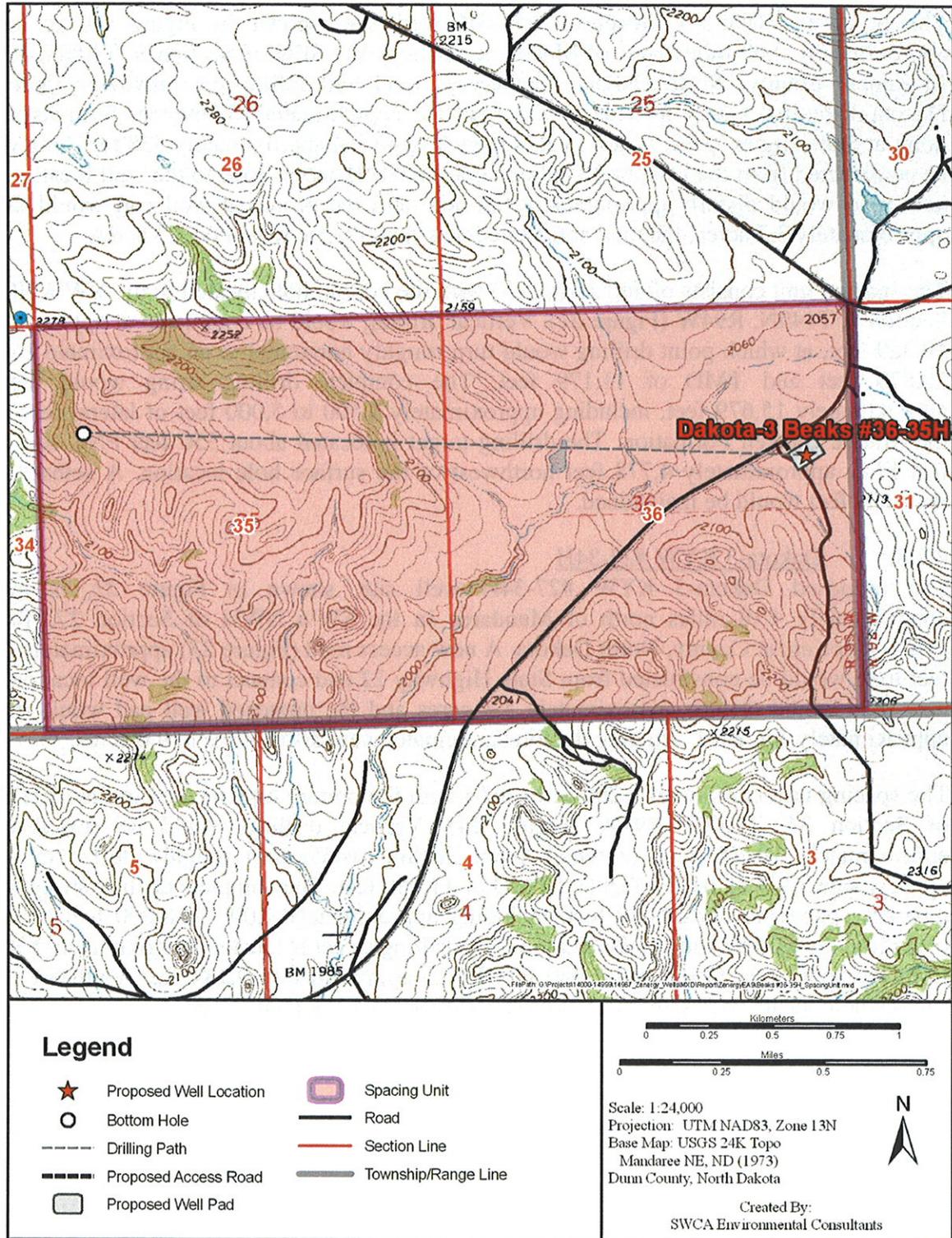


Figure 18. Dakota-3 Beaks #36-35H proposed location showing spacing unit and drilling target.

2.2.8.4 Dakota-3 Stevenson #15-8H

The proposed Dakota-3 Stevenson #15-8H well site, shown in Figure 19, is located approximately 2.69 miles west of Mandaree in the SW $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 8, T149N, R94W, McKenzie County, North Dakota. The access road will follow the previously permitted Dakota-3 Pauline Grady #4-19H access road for approximately 5,069 feet from its access point at State Highway 22. A new access road (Figure 20) approximately 528 feet long would be constructed from the Dakota-3 Pauline Grady #4-19H access road to the well location. The new road would disturb approximately 0.8 acre and the proposed well pad would disturb approximately 3.7 acres; the total anticipated new disturbance would be 4.5 acres.

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the NW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 8, T149N, R94W (Figure 21). Vertical drilling would be completed at approximately 10,329 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,879 feet and TMD of 11,179 feet. The complete drilling string would measure approximately 15,679 feet, including approximately 4,500 to 5,000 feet of lateral reach into the Middle Bakken Formation. The drilling target is located about 550 feet FNL and 1,980 feet FEL, approximately 4,778 feet northwest of the surface hole location. A setback of at least 500 feet would be maintained.

2.2.8.5 Dakota-3 KYW #27-34H

The proposed Dakota-3 KYW #27-34H well site, shown in Figure 22, is located approximately 4.18 miles north of Mandaree in the SW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 27, T150N, R94W, McKenzie County, North Dakota. A new access road (Figure 23) approximately 3,522 feet long would be constructed from State Highway 22 and connect to the well location. The new road would disturb approximately 5.3 acres and the proposed well pad would disturb approximately 3.7 acres, bringing the total anticipated new disturbance to 9.0 acres.

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located in the SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 34, T150N, R94W (Figure 24). Vertical drilling would be completed at approximately 10,200 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,750 feet and TMD of 11,050 feet. The complete drilling string would measure approximately 18,050 feet, including approximately 7,000 to 8,000 feet of lateral reach into the Middle Bakken Formation. The drilling target is located approximately 550 feet from the south line (FSL) and 1,980 feet FWL, approximately 9,134 feet southeast of the surface hole location. A setback of at least 500 feet would be maintained.



**Figure 19. Dakota-3 Stevenson #15-8H well pad area, looking west.**



**Figure 20. Dakota-3 Stevenson #15-8H access road area, looking north-northwest.**

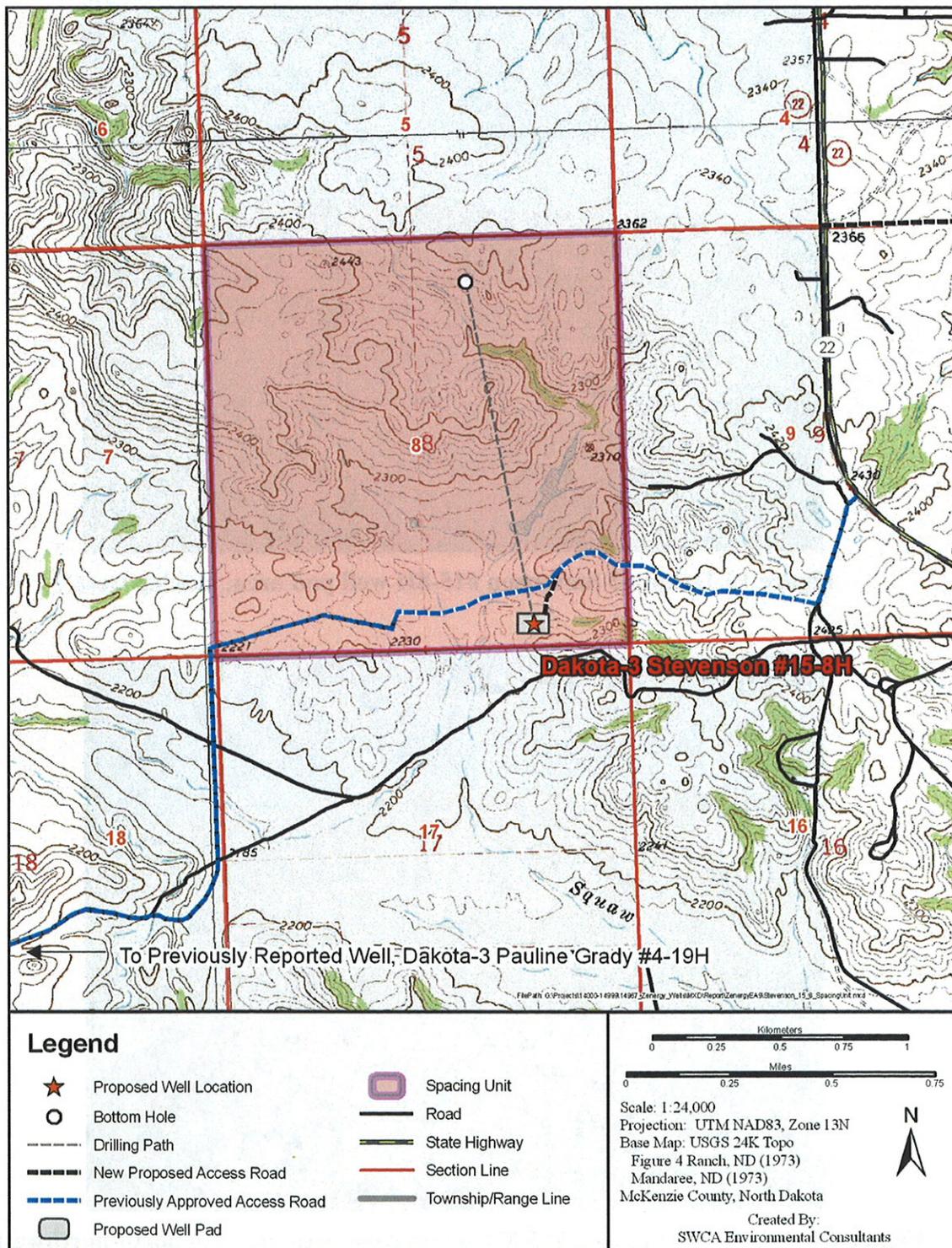


Figure 21. Dakota-3 Stevenson #15-8H proposed location showing spacing unit and drilling target.



**Figure 22. Dakota-3 KYW #27-34H well pad area, looking west.**



**Figure 23. Dakota-3 KYW #27-34H access road area, looking east.**

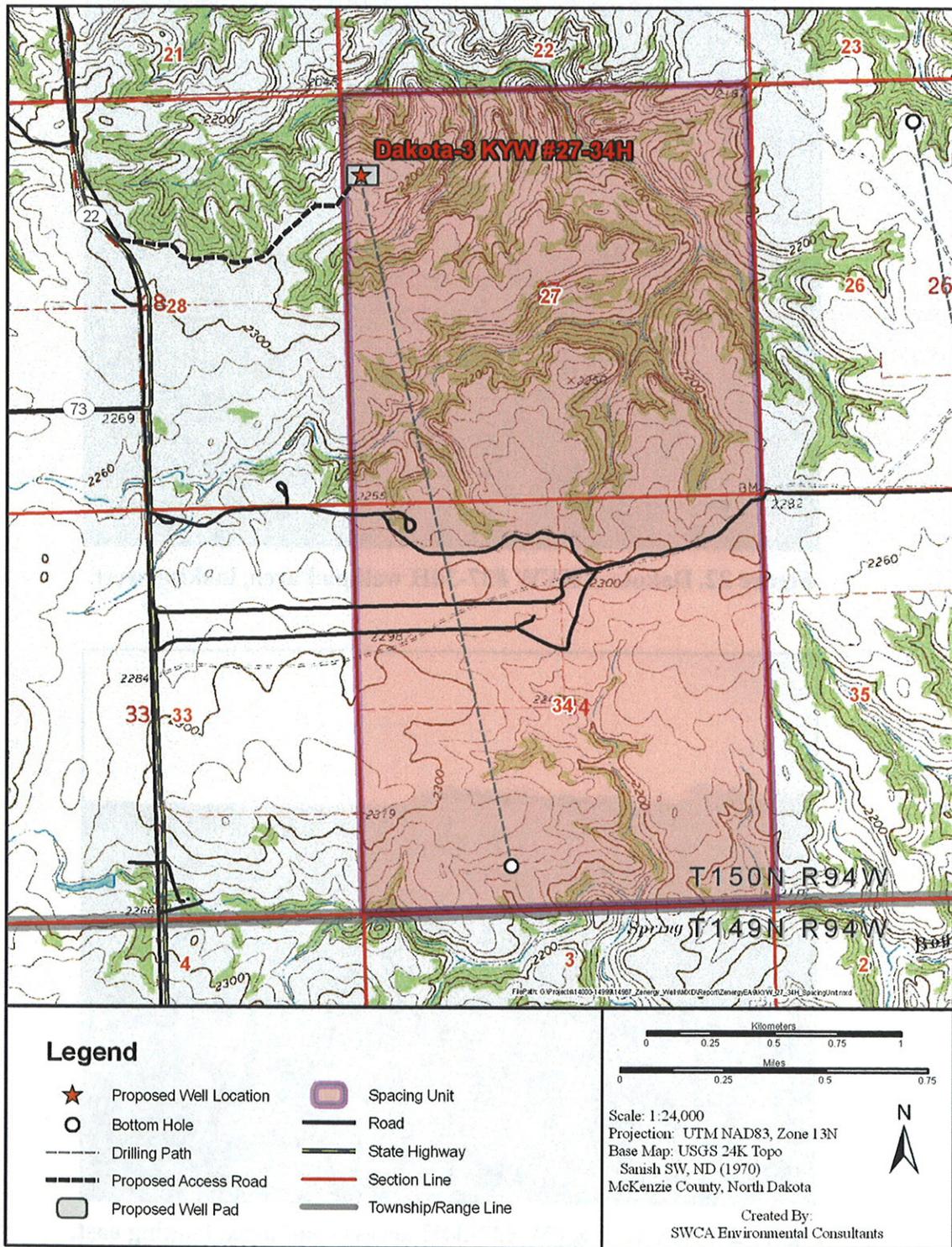


Figure 24. Dakota-3 KYW #27-34H proposed location showing spacing unit and drilling target.

### **2.2.9 Reclamation**

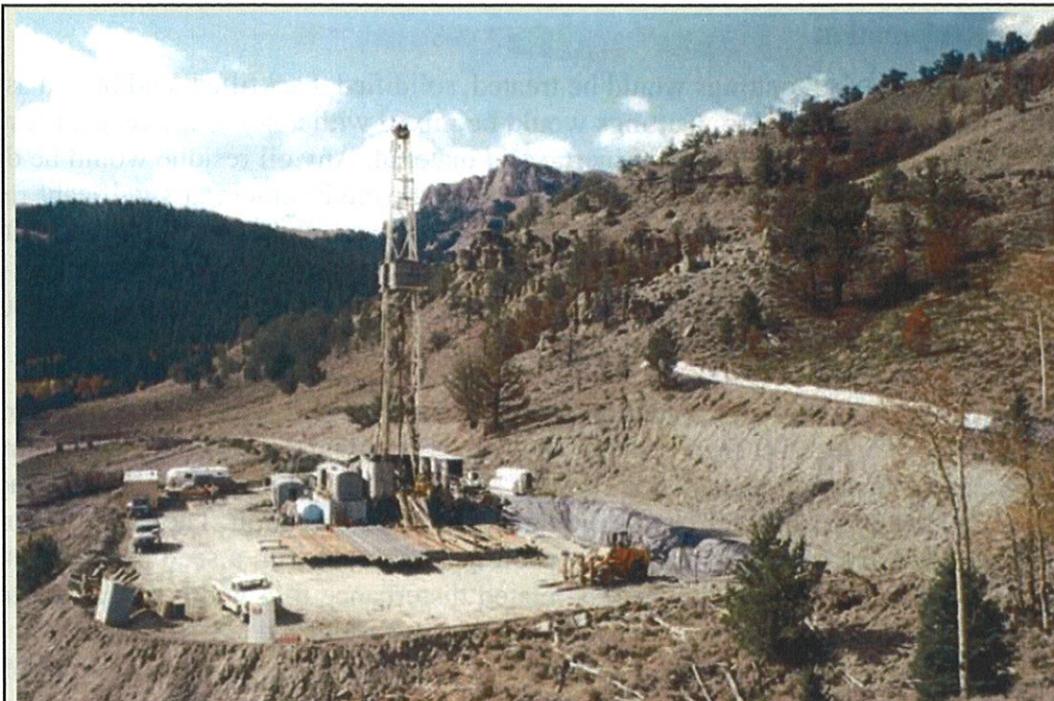
The reserve pit and drill cuttings would be treated, solidified, backfilled, and buried as soon as possible after well completion. Cuttings would be mixed with a non-toxic reagent resulting in an irreversible reaction to produce an inert, solid material. Any oil residue would be dispersed and captured, preventing coalescence and release to the environment at significant rates. The alkaline nature of the stabilized material also chemically stabilizes various metals that may be present, primarily by converting them into less soluble compounds. The treated material would then be buried in the reserve pit, and overlain by at least 4 feet of overburden as required by adopted NDIC regulations.

If commercial production equipment is installed, the well pad would be reduced in size to approximately 300 by 200 feet, and the rest of the original pad would be reclaimed. The working area of each well pad and the running surface of access roads would be surfaced with scoria or crushed rock obtained from a previously approved location. The outslope portions of roads would be covered with stockpiled topsoil and reseeded with a seed mixture determined by the BIA, reducing the residual access-related disturbance to a width of approximately 28 feet. Other interim reclamation measures to be accomplished in the first year include reduction of the cut-and-fill slopes, redistribution of stockpiled topsoil, installation of erosion control measures, and reseeded as recommended by the BIA.

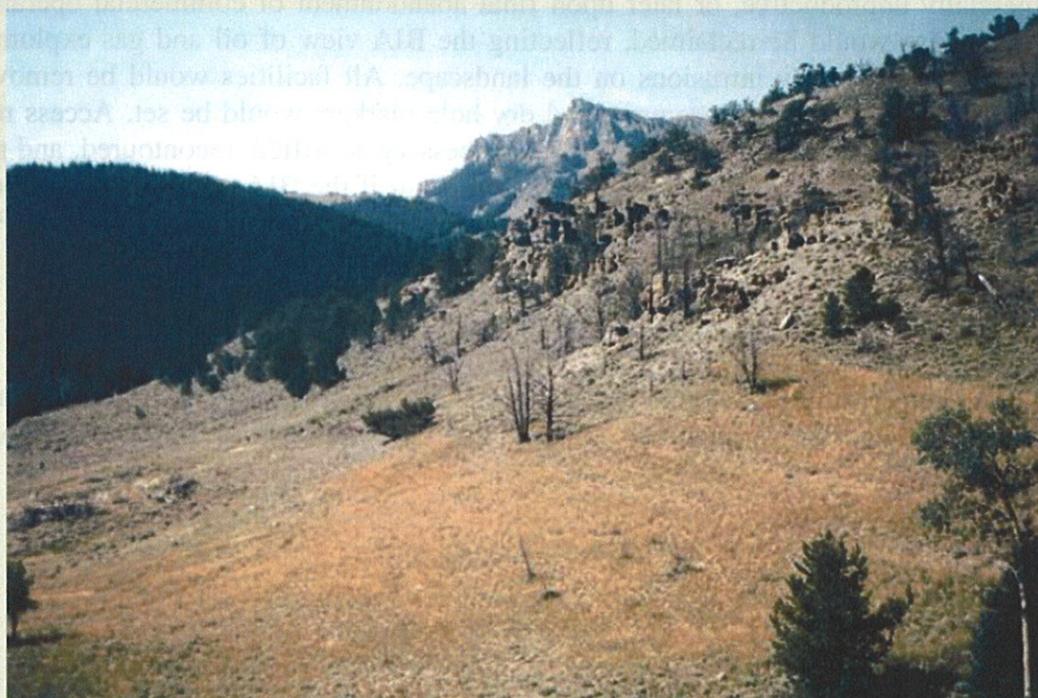
Final reclamation would occur either in the very short term if the proposed well is commercially unproductive, or later upon final abandonment of commercial operations. All disturbed areas would be reclaimed, reflecting the BIA view of oil and gas exploration and production as temporary intrusions on the landscape. All facilities would be removed, well bores would be plugged with cement, and dry hole markers would be set. Access roads and work areas would be leveled or backfilled as necessary, scarified, recontoured, and reseeded. Exceptions to these reclamation measures might occur if the BIA approves assignment of an access road either to the BIA roads inventory or to concurring surface allottees. Figure 25 shows an example of reclamation (BLM and USFS 2007).

### **2.3 BIA-PREFERRED ALTERNATIVE**

The BIA-preferred alternative is to complete all administrative actions and approvals necessary to authorize or facilitate oil and gas developments at the five proposed well locations.



The well pad and access road are constructed to the minimum size necessary to safely conduct drilling and completion operations.



The well pad and access road have been recontoured back to the original contour, the topsoil respread, and the site revegetated.

**Figure 25. Example of reclamation from the BLM Gold Book (BLM and USFS 2007).**

### **3.0 THE AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS**

The Reservation is the home of the MHA Nation. Located in west-central North Dakota, the Reservation encompasses more than one million acres, of which almost half are held in trust by the United States for either the MHA Nation or individual allottees. The remainder of the land is owned in fee simple title, sometimes by the MHA Nation or tribal members, but usually by non-Indians. The Reservation occupies portions of six counties, including Dunn, McKenzie, McLean, Mercer, Mountrail, and Ward. In 1945, the Garrison Dam was completed, inundating much of the Reservation. The remaining land was divided into three sections near Lake Sakakawea, an impoundment of the Missouri River upstream of the Garrison Dam.

The proposed wells and access roads are geologically situated in the Williston Basin, where the shallow structure consists of sandstones, silts, and shales dating to the Tertiary Period (65 to 2 million years ago), including the Sentinel Butte and Golden Valley formations. The underlying Bakken Formation is a well-known source of hydrocarbons; its middle member is targeted by the proposed project. Although earlier oil/gas exploration activity in the Reservation was limited and commercially unproductive, recent economic changes and technological advances now make accessing oil in the Bakken Formation feasible.

The Reservation is within the northern Great Plains ecoregion, which consists of four physiographic units: 1) the Missouri Coteau Slope north of Lake Sakakawea; 2) the Missouri River trench (not flooded); 3) the Little Missouri River badlands; and 4) the Missouri Plateau south and west of Lake Sakakawea (Williams and Bluemle 1978). Much of the Reservation is on the Missouri Coteau Slope. Elevations of the glaciated, gently rolling landscape range from a normal pool elevation of 1,838 feet at Lake Sakakawea to more than 2,600 feet on Phaelan's Butte near Mandaree. Annual precipitation on the plateau averages between 15 and 17 inches. Mean temperatures fluctuate between -3 and 21 degrees Fahrenheit (°F) in January and between 55°F and 83°F in July, with 95 to 130 frost-free days each year (Bryce et al. 1998; High Plains Regional Climate Center 2008).

The proposed well sites and spacing units are in a rural area consisting of mostly grassland, shrubland, and cropland that is currently farmed, idle, or used to graze livestock. The landscape has been previously disturbed by dirt trails and gravel and paved roadways. Fifteen residences are within 1 mile of the proposed well sites, the closest being 1,019 feet northeast of the Dakota-3 Beaks #36-35H location (Table 1).

**Table 1. Distance and Direction from Proposed Wells to Nearest Home.**

<b>Proposed Well</b>	<b>Feet to Nearest Home</b>	<b>Direction to Nearest Home</b>
Dakota-3 Black Hawk #15-34H	2,229	Southwest
Dakota-3 Rubia #16-24H	8,342	South
Dakota-3 Beaks #36-35H	1,019	Northeast
Dakota-3 Stevenson #15-8H	2,459	Southeast
Dakota-3 KYW #27-34H	3,517	West

The broad definition of the human and natural environment under NEPA leads to the consideration of the following elements: air quality, public health and safety, water resources, wetland/riparian habitat, threatened and endangered species, soils, vegetation and invasive species, cultural resources, socioeconomic conditions, and environmental justice. Potential impacts to these elements are analyzed for both the No Action Alternative (described in Section 2.1) and the Proposed Action. Impacts may be beneficial or detrimental, direct or indirect, and short-term or long-term. This EA also analyzes the potential for cumulative impacts, and ultimately makes a determination as to the significance of any impacts. In the absence of significant negative consequences, it should be noted that a significant benefit from the project does *not* in itself require preparation of an EIS.

### **3.1 AIR QUALITY**

#### **3.1.1 Introduction**

The federal Clean Air Act (CAA), as amended in 1990, established national ambient air quality standards for criteria pollutants to protect public health and welfare. It also set standards for cancer-causing compounds, regulated emissions that cause acid rain, and required federal permits for large sources. National standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. These standards were set for pervasive compounds that are generally emitted by industry or motor vehicles. Standards for each pollutant meet specific public health and welfare criteria; thus they are called the “criteria pollutants.” Some states have adopted more stringent standards for criteria pollutants, or have chosen to adopt new standards for other pollutants. For instance, North Dakota has a standard for hydrogen sulfide that the Environmental Protection Agency (EPA) does not.

#### **3.1.2 Atmospheric Stability and Dispersion, and Pollutant Concentrations**

The quantity of pollutant emissions in an area and the degree to which these pollutants disperse directly affects resulting concentrations (and hence affects health). Pollutant dispersion, in turn, is directly affected by atmospheric stability. Atmospheric stability determines the amount of vertical and horizontal air exchange, or mixing, that can occur within a given air basin. Restricted mixing and low wind speeds characterize a high degree of atmospheric stability. These conditions are characteristic of temperature inversions. The height of the inversion determines the mixing volume trapped below.

Three types of temperature inversions typically occur that affect air quality: subsidence, katabatic, and radiation. A subsidence inversion occurs when a mass of aloft high-pressure (cold) air slowly sinks toward the surface. This causes the air underneath to heat as it is compressed. These subsiding layers are more stable than they were at their original higher altitudes. These inversions break up when a low-pressure front moves into the area and causes turbulence.

Katabatic inversions occur when air cooling at higher elevations (e.g., hills) slides, because it is denser, down into valleys. This cool air in turn lifts warmer air, creating a strong boundary layer. If pollutants are emitted into the air near the surface after this inversion forms, there will be little vertical mixing until the inversion breaks. Katabatic inversions typically break when the sun warms the earth's surface and allows warmer air to float up through the boundary layer, thus creating vertical mixing.

Radiation inversions form when the lowest levels of the atmosphere are cooled by contact with the earth's surface, which cools by emitting radiation. Factors that help a radiation inversion form include calm winds, dry air, clear skies, long nights, and moist ground surface. Radiation inversions often occur in winter after rainstorms. They are often marked by strong surface fog. Like katabatic inversions, these inversions typically break up when the sun's energy penetrates to the surface, causing vertical mixing to occur.

The winds and unstable air conditions experienced during the passage of storms result in low pollutant concentrations and excellent visibility. Between winter storms, high pressure and light winds allow cold moist air to pool on the valley floors and in low areas. This creates strong low-level temperature inversions and very stable air conditions. This situation can lead to foggy conditions. If acidic compounds such as sulfur dioxide are present, the fog may become acidic as chemicals adsorb onto water droplets. Fog measurements in some areas of the western United States have found acid levels the same as table vinegar (pH 3.5).

Conditions favorable to fog formation are also conditions favorable to high concentrations of carbon monoxide and particulate matter of 2.5 microns or smaller (PM<sub>2.5</sub>). Maximum carbon monoxide concentrations tend to occur on clear, cold nights when a strong surface inversion is present and large quantities of emissions are occurring. The water droplets in fog, however, can act as a sink for carbon monoxide and nitrogen oxides, temporarily lowering pollutant concentrations. At the same time, though, fog can also help in the formation of secondary particulates such as ammonium sulfate. These secondary particulates are believed to be a significant contributor of high winter PM<sub>2.5</sub> levels.

### **3.1.3 Greenhouse Gas Emissions and Climate Change**

Carbon dioxide (CO<sub>2</sub>) is the primary greenhouse gas (GHG), responsible for approximately 90% of radiative forcing (the rate of energy change as measured at the top of the atmosphere; this can be positive [warmer] or negative [cooler]). To simplify discussion of the various GHGs, the term "equivalent CO<sub>2</sub>, or CO<sub>2</sub>e" has been developed. CO<sub>2</sub>e is the amount of CO<sub>2</sub> that would cause the same level of radiative forcing as a unit of one of the other GHGs. For example, 1 ton of methane (CH<sub>4</sub>) has a CO<sub>2</sub>e of 22 tons; therefore, 22 tons of CO<sub>2</sub> would cause the same level of radiative forcing as 1 ton of CH<sub>4</sub>. Nitrogen dioxide has a CO<sub>2</sub>e value

of 310. Thus, control strategies often focus on the gases with the highest CO<sub>2</sub>e value. CH<sub>4</sub> is a common fugitive gas emission in oil and gas fields and is emitted at many phases of exploration and production.

According to the Center for Integrative Environmental Research at the University of Maryland (2008), climate change will affect North Dakota's climate significantly over time. North Dakota will experience an increase in the unpredictability of droughts, floods, and pests making it harder for farmers to remain economically viable in the agricultural industry. This damage to the agricultural community will subsequently be a detriment to the livestock industry. Additionally, due to reductions in the amount of available wildlife habitat, including receding water levels, North Dakota's hunting, fishing, and tourism industries will be damaged.

### **3.1.4 Criteria Pollutants**

**Ozone** is a colorless gas with a pungent, irritating odor, and creates a widespread air quality problem in most of the world's industrialized areas. Ozone smog is not emitted directly into the atmosphere but is primarily formed through the reaction of hydrocarbons and nitrogen oxides in the presence of sunlight. Ozone's health effects can include reduced lung function; aggravated respiratory illness; and irritated eyes, nose, and throat. Chronic exposure can cause permanent damage to the alveoli of the lungs. Ozone can persist for many days after formation, and travel several hundred miles.

**Respirable particulate matter** is a class of compounds that can lodge deep in the lungs causing health problems. Based on extensive health studies, particulate matter is regulated under two classes. PM<sub>10</sub> describes particles 10 microns or smaller, and PM<sub>2.5</sub> is 2.5 microns or smaller. Respirable particulate matter can range from inorganic wind-blown soil to organic and toxic compounds found in diesel exhaust. Toxic compounds such as benzene often find a route into the body via inhalation of fine particulate matter.

**Nitrogen dioxide (NO<sub>2</sub>)** is a reddish-brown gas with an irritating odor. Primary sources include motor vehicles, industrial facilities, and power plants. In the summer months, nitrogen dioxide is a major component of photochemical smog. Nitrogen dioxide is an irritating gas that may constrict airways, especially of asthmatics, and increase the susceptibility to infection in the general population. Nitrogen dioxide is also involved in ozone smog production.

**Carbon monoxide (CO)** is a colorless, odorless gas that is a byproduct of incomplete combustion. Carbon monoxide concentrations typically peak nearest a source such as roadways or areas with high fireplace use, and decrease rapidly as distance from the source increases. Ambient levels are typically found during periods of stagnant weather, such as on still winter evenings with a strong temperature inversion. Carbon monoxide is readily absorbed into the body from the air. It decreases the capacity of the blood to transport oxygen, leading to health risks for unborn children and people suffering from heart and lung disease. The symptoms of excessive exposure are headaches, fatigue, slow reflexes, and dizziness.

**Sulfur dioxide (SO<sub>2</sub>)** is a colorless gas with a strong, suffocating odor. Sulfur dioxide is produced by burning coal, fuel oil, and diesel fuel. Sulfur dioxide can trigger constriction of the airways, causing particular difficulties for asthmatics. Long-term exposure is associated with increased risk of mortality from respiratory or cardiovascular disease. Sulfur dioxide emissions are also a primary cause of acid rain and plant damage.

The federal and state governments have set standards based on set criteria for various air pollutants caused by human activity. Table 2 summarizes the standards for these criteria pollutants.

**Table 2. Air Quality Standards and Monitored Data.**

Pollutant	Averaging Period	NAAQS (µg/m <sup>3</sup> ) or (ppm)	Year		
			2006	2007	2008
SO <sub>2</sub> (in ppm)	24-hour	0.14	0.011	0.011	0.009
	Annual Mean	0.03	0.002	0.002	0.002
PM <sub>10</sub> (in µg/m <sup>3</sup> )	24-hour	150	50	57	108
	Annual Mean	50	14	13	16
PM <sub>2.5</sub> (in µg/m <sup>3</sup> )	24-hour	35	18.9	13.5	16.4
	Weighted Annual Mean	15	6.3	6.6	6.7
NO <sub>2</sub> (in ppm)	Annual Mean	0.053	0.003	0.003	0.003
O <sub>3</sub> (in ppm)	1-hour	0.12	0.076	0.076	0.069
	8-hour	0.08	0.067	0.065	0.063

Source: EPA 2009. µg/m<sup>3</sup> = micrograms per cubic meter; ppm = parts per million

Note: For PM<sub>2.5</sub> the fourth-highest 24-hour value is reported per EPA attainment evaluation protocol.

### 3.1.5 Hazardous Air Pollutants

Hazardous air pollutants (HAPs) are a class of compounds known to cause cancer, mutation, or other serious health problems. HAPs are usually a localized problem near an emission source. HAPs are regulated separately from criteria air pollutants. Several hundred HAPs are recognized by the EPA and the State of North Dakota. Health effects of HAPs may occur at exceptionally low levels; for many HAPs, it is not possible to identify exposure levels that do *not* produce adverse health effects. Major sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), wood smoke, and motor vehicle exhaust. Unlike regulations for criteria pollutants, there are no ambient air quality standards for HAPs. Examples of HAPs found in gases released by oil field development and operation include benzene, toluene, xylene, and formaldehyde (BLM 2009). HAP emissions receive evaluation based on the degree of exposure that can cause risk of premature mortality, usually from cancer.

Risk assessments express premature mortality in terms of the number of deaths expected per million persons. The North Dakota Department of Health (NDDH) typically reviews projects and either requires an applicant to prepare a risk assessment or assign the state engineers to do the work. The state requires that maximum individual cancer risk be calculated using its adopted protocol (the Determination of Compliance in the state's Air Toxics Policy). For new

sources emitting HAPs with known negative health effects, an applicant must demonstrate that the combined impact of new HAP emission does not result in a maximum individual cancer risk greater than  $1 \times 10^{-5}$  (1 in 100,000).

### **3.1.6 Air Monitoring**

The NDDH operates a network of monitoring stations around the state that continuously measure pollution levels. Industry also operates monitoring stations as required by the state. The data from all these stations is subject to quality assurance, and when approved, it is published on the Internet (available from the EPA and other sources). Monitoring stations near the project site include Watford City in McKenzie County, Dunn Center in Dunn County, and Beulah in Mercer County. These stations are located west, south, and southeast of the proposed well sites, respectively. Criteria pollutants measured include SO<sub>2</sub>, PM<sub>10</sub>, NO<sub>2</sub>, and ozone. Lead and carbon monoxide are not monitored by any of the three stations. Table 2 summarizes federal air quality standards and available air quality data from the three county study areas. The highest value at any of the three monitoring locations is shown for each year.

Note that North Dakota has separate state standards for several pollutants that are different from the federal criteria standards. These are:

- SO<sub>2</sub> (parts per million [ppm]) – 0.023 annual arithmetic mean, 0.099 24-hour concentration, and 0.273 one-hour concentration
- Hydrogen sulfide (H<sub>2</sub>S) (ppm) – 10 instantaneous, 0.20 one-hour, 0.10 24-hour, and 0.02 three-month arithmetic mean

All other state criteria pollutant standards are the same the federal standards (shown in Table 2). North Dakota was one of 13 states that met standards for all federal criteria pollutants in 2008.

The CAA mandates prevention of significant deterioration (PSD) in the designated attainment areas. Class I attainment areas have national significance and include national parks greater than 6,000 acres, national monuments, national seashores, and federal wilderness areas larger than 5,000 acres that were designated prior to 1977. Theodore Roosevelt National Park, a Class I area that covers about 110 square miles in three units within the Little Missouri National Grassland, lies between Medora and Watford City and is roughly 30 to 40 miles west of the proposed well sites. All other parts of the state, including the Reservation, are classified as Class II, affording them a lower level of protection from significant deterioration.

### **3.1.7 Response to the Threat of Climate Change**

The EPA has proposed an endangerment finding that would allow regulation of GHGs under the CAA. The first step is a regulation that requires sources emitting 25,000 tons or more CO<sub>2e</sub> to report their emissions. The EPA and the National Highway Traffic Safety Administration have increased corporate fuel economy standards to promote national energy security and reduce GHGs. Standards will equal 35 miles per gallon by 2020, with an estimated savings to drivers of \$100 billion annually. Many U.S. states and foreign nations have adopted goals and actions to reduce GHGs to levels scientists forecast will allow the

earth's climate to stabilize at 1 to 2 degrees Celsius above the current level. Additional regulation is currently being developed by Congress to roll back emissions to levels recommended by atmospheric scientists.

### **3.1.8 Project Emissions**

Oil field emissions encompass three primary areas: combustion, fugitive, and vented.

- Combustion emissions include SO<sub>2</sub>, ozone precursors called volatile organic compounds (VOCs), GHGs, and HAPs. Sources include engine exhaust, dehydrators, and flaring.
- Fugitive emissions include criteria pollutants, H<sub>2</sub>S, VOCs, HAPs, and GHGs. Sources include equipment leaks, evaporation ponds and pits, condensate tanks, storage tanks, and wind-blown dust (from truck and construction activity).
- Vented emissions include GHGs, VOCs, and HAPs. Primary sources are emergency pressure relief valves and dehydrator vents.

Pad and road construction, drilling activities, and tanker traffic would generate emissions of criteria pollutants and HAPs. Primary emissions sources during drilling are diesel exhaust, wind-blown dust from disturbed areas and travel on dirt roads, evaporation from pits and sumps, and gas venting. Diesel emissions are being progressively controlled by the EPA in a nationwide program. This program takes a two-pronged approach. First, fuels are improving to the ultra-low sulfur standard, and second, manufacturers must produce progressively lower engine emissions.

### **3.1.9 Regulatory Emission Controls**

Under the CAA, federal land management agencies have an affirmative responsibility to help protect air quality. The tribes, federal land managers, and the State of North Dakota can make emission controls part of a lease agreement. The proposed project is similar to other projects installed nearby with state approval. State policy for permitting new oil and gas wells is as follows: Any oil or gas well production facility that emits or has the potential to emit 250 tons per year or more of any air contaminant regulated under North Dakota code must comply with state permitting requirements. The discussion outlines requirements for control of emissions from treaters, separators, flares, tanks, and other on-site equipment.

The North Dakota Air Pollution Control Rules (2009) require that the owner/operator submit an oil/gas facility registration form. This form must include an analysis of any gas produced from the well. The following sources must register oil and gas wells with the NDDH:

1. Any oil and gas well that is/was completed or re-completed on or after July 1, 1987. The registration form must be submitted within 90 days of the completion or re-completion of the well.
2. The owner or operator of any oil or gas well shall inform the NDDH of any change to the information contained on the registration form for a particular well. The owner shall submit a new gas analysis if the composition or the volume of the gas produced

from the well has changed from the previous analysis, and caused an increase of 10 tons per year or more in sulfur compounds.

3. North Dakota rules require that all new sources of H<sub>2</sub>S and VOCs be flared or treated in an equally effective manner. Flares must have an automatic igniter or pilot light. The stack height of flares will be sufficient to allow dispersion of the flared gas. The gas produced from the Bakken Formation is typically low in H<sub>2</sub>S, so odors from fugitive gas leaks are not expected to be a problem.
4. Chapter 33-15.03.03 of the North Dakota Air Pollution Control Rules specify that fugitive dust emissions greater than 40% opacity cannot leave the project site for more than one 6-minute period per hour. This applies to all construction and unpaved road emission sources.

### **3.1.10 Best Management Practices**

Under the CAA, federal land management agencies have an affirmative responsibility to protect air quality. Tribes, federal land managers, and private entities can make emission controls part of a lease agreement. BMPs can be adopted for various portions of an oil/gas well's lifecycle. BMPs fall into six general categories:

- Transportation
- Drilling
- Unplanned or emergency releases
- Vapor recovery
- Inspection and maintenance
- Monitoring and repair

The BLM has developed a set of BMPs for oil and gas extraction. As documented in case studies, applying many of the recommended BMPs produced substantial savings and increased revenue from fixed assets. The leasing agent (e.g., BLM) will negotiate a set of BMPs with the applicant before final sale. These BMPs will be formally presented, in writing, to the NDDH as part of the oil/gas facility registration process. They will also run with the land so that any transfer requires the new operator to meet or exceed the same standards for emission control.

## **3.2 WATER RESOURCES**

### **3.2.1 Surface Water**

As shown in Figure 26, the Dakota-3 Rubia #16-24H is located near Upper Squaw Creek which is classified by the U.S. Geological Survey (USGS) as perennial. None of the other proposed project areas are located near perennial water bodies. Given the topography of the individual sites over the project area, runoff occurs largely as sheet-flow. Runoff that concentrates near the proposed project well areas will flow to Bear Den Bay, Skunk Creek, and Upper Squaw Creek, and subsequently into Lake Sakakawea.

The proposed Dakota-3 Black Hawk #15-34H is located in the Skunk Creek subwatershed (Hydrologic Unit Code [HUC] 101101012102) of the Independence Point Bay Watershed (Figure 26). The Skunk Creek subwatershed is part of the Lake Sakakawea sub-basin, the Lake Sakakawea basin, the Little Missouri River and subregion, and Missouri region. Runoff from the well pad would flow to the east into an unnamed ephemeral tributary of Skunk Creek (HUC 10110101001095) and travel approximately 5.5 miles until reaching perennial waters in Lake Sakakawea (Figure 27). The well pad will use a closed loop system during drilling due to its close proximity to Squaw Creek.

The proposed Dakota-3 Rubia #16-24H is located in the Upper Squaw Creek subwatershed (HUC 1011020050607) of the Waterchief Bay Watershed (Figure 26). This subwatershed is part of the Lower Little Missouri River sub-basin, the Little Missouri basin and subregion, and Missouri region. Runoff from the well pad would flow to the west into an unnamed ephemeral tributary of Upper Squaw Creek (HUC 10110205006134). Runoff would travel approximately 26.1 miles until reaching perennial waters in Lake Sakakawea (Figure 27).

The proposed Dakota-3 Beaks #36-35H is located in the Lower Squaw Creek/Squaw Creek Bay subwatershed (HUC 101102050608) of the Waterchief Bay Watershed (Figure 26). It is part of the Lower Little Missouri sub-basin, Little Missouri basin, Little Missouri subregion, and Missouri region. Runoff from the well pad would flow to the west into an unnamed ephemeral tributary of Lower Squaw Creek (HUC 10110205002369) and travel approximately 12.2 miles until reaching perennial waters in Lake Sakakawea (Figure 27).

The proposed Dakota-3 Stevenson #15-8H is located in the Upper Squaw Creek subwatershed (HUC 1011020050607) of the Waterchief Bay Watershed (Figure 26). It is part of the Lower Little Missouri River sub-basin, the Little Missouri basin and subregion, and Missouri region. Runoff from the well pad would flow to the west into an unnamed ephemeral tributary of Upper Squaw Creek (HUC 10110205006089) and travel approximately 34.5 miles until reaching perennial waters in Lake Sakakawea (Figure 27).

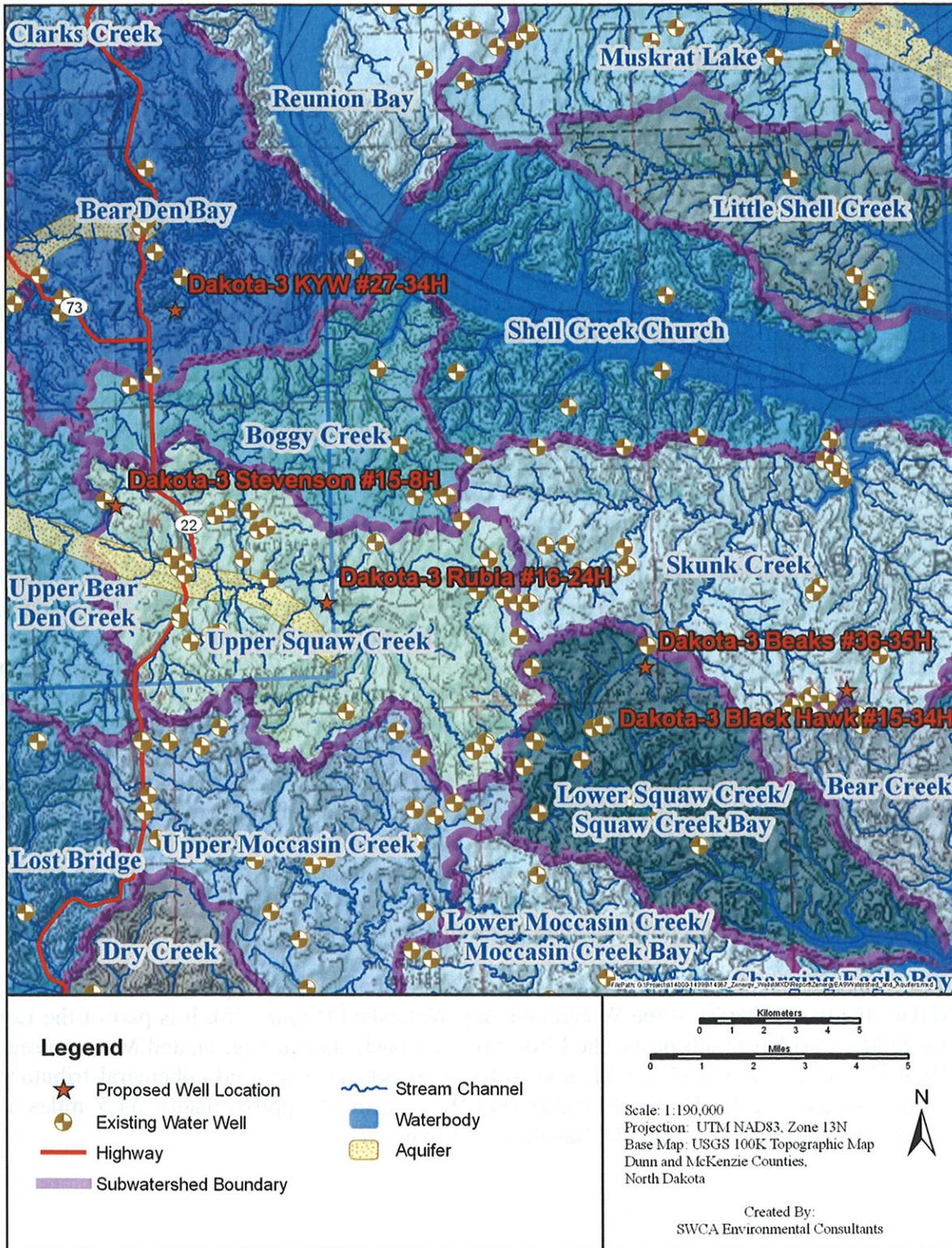


Figure 26. Watersheds and aquifers.

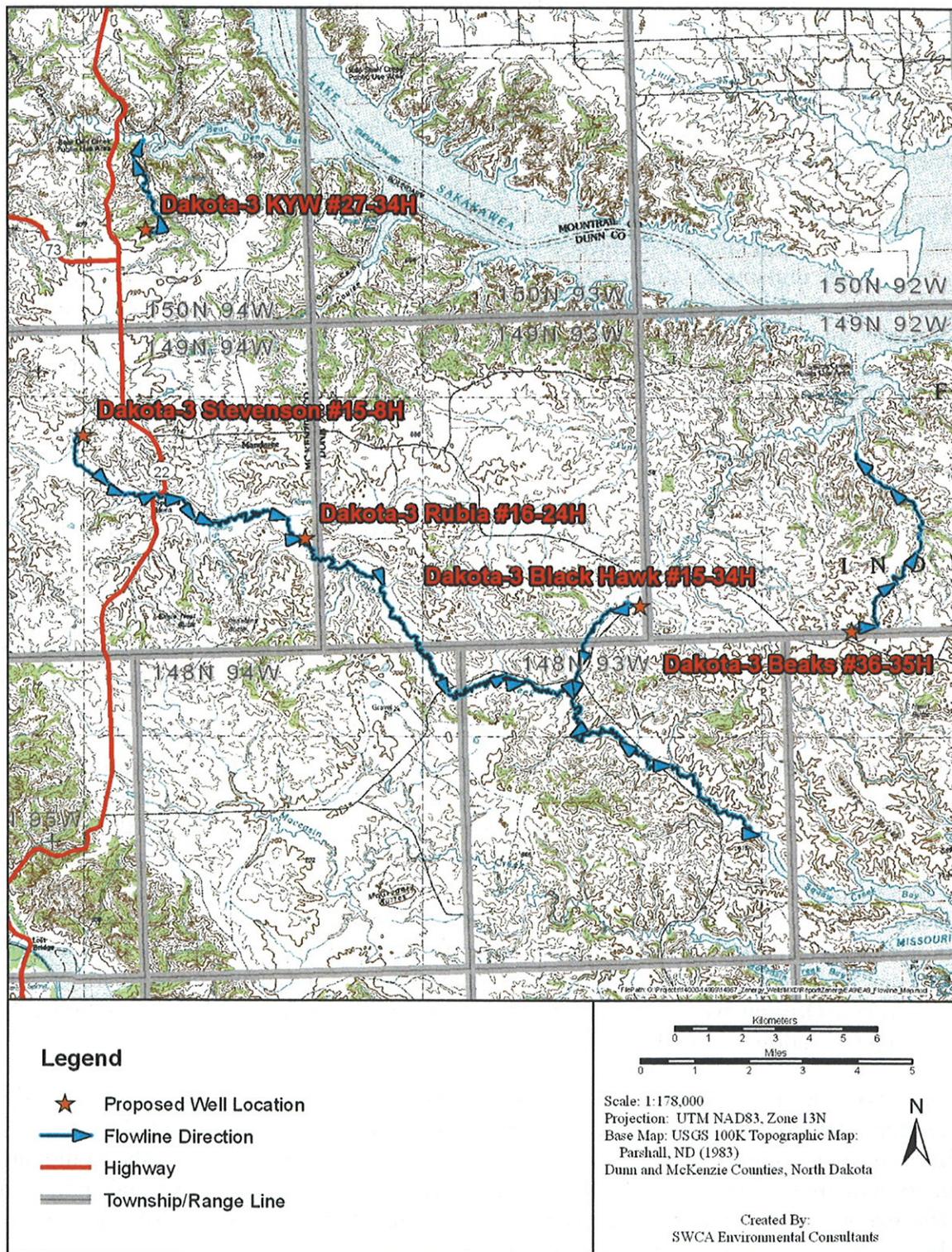


Figure 27. Flow lines from the well pad locations.

The proposed Dakota-3 KYW #27-34H is located in the Bear Den Bay subwatershed (HUC 101101012004) of the Bear Den Creek Watershed (Figure 26). It is part of the Lake Sakakawea, North Dakota sub-basin, Lake Sakakawea basin, Little Missouri subregion, and Missouri region. Runoff from the well pad would flow to the east into an unnamed ephemeral tributary of Bear Den Bay (HUC 101101012058) and travel approximately 2.5 miles until reaching perennial waters in Lake Sakakawea (Figure 27).

The proposed project would be engineered and constructed to minimize the suspended sediment (i.e., turbidity) concentration of surface runoff, avoid disruption of drainages, and avoid direct impacts to surface water. No surface water would be used for well drilling operations. Any chemicals or potentially hazardous materials would be handled in accordance with the operator's spill prevention, control, and countermeasure plan. Provisions established under this plan would minimize potential impacts to any surface waters associated with an accidental spill.

### **3.2.2 Groundwater**

Aquifers in the project area include, from deepest to shallowest, the Cretaceous Fox Hills and Hell Creek formations and the Tertiary Ludlow, Tongue River, and Sentinel Butte formations (Table 3). Several shallow aquifers related to post-glacial outwash composed of till, silt, sand, and gravel are located in Dunn and McKenzie counties. However, none are within the proposed project areas (Figure 26). The shallow Sentinel Butte Formation, commonly used for domestic supply in the area, outcrops in Dunn County and meets standards of the North Dakota Department of Health (Croft 1985). Detailed analyses are available from the North Dakota Geological Survey, Bulletin 68, Part III, 1976.

Review of electronic records of the North Dakota State Water Commission revealed 134 existing water wells within an approximate 5-mile boundary of the proposed project areas (Table 4). Eight of these water wells are found within 1 mile of Dakota-3 Black Hawk #15-34H, zero water wells within 1 mile of Dakota-3 Rubia #16-24H, one water well within 1 mile of Dakota-3 Beaks #36-35H, one water well within 1 mile of Dakota-3 Stevenson #15-8H, and one water well within 1 mile of Dakota-3 KYW #27-34H. Water quality would be protected by drilling with freshwater to a point below the base of the Fox Hills Formation, implementing proper hazardous materials management, and using appropriate casing and cementing. Drilling would proceed in compliance with Onshore Oil and Gas Order No. 2, Drilling Operations (43 CFR 3160).

Since none of the proposed project area lies within the boundaries of the post-glacial outwash aquifers, low porosity bedrock near the project wells would act as confining layers to prevent impacts to groundwater resources. Additionally, well completion methods would prevent cross contamination between aquifers or the introduction of hazardous materials into aquifers. The majority of the identified groundwater wells may have minimal hydrologic connections due to their respective distance from the project wells.

**Table 3. Common Aquifers in the Proposed Project Area and Surrounding Region.**

Period	Formation		Depth Range (feet)	Thickness (feet)	Lithology	Water-Yielding Characteristics
Quaternary	Alluvium		0-40	40	Silt, sand, and gravel	Maximum yield of 50 gal/min to individual wells from sand and gravel deposits.
Tertiary	Fort Union Group	Sentinel Butte	0-670	0-670	Silty, clay, sand and lignite	5 to 100 gal/min in sandstone. 1 to 200 gal/min in lignite.
		Tongue River	140-750	350-490	Silty, clay, sand and lignite	Generally less than 100 gal/min in sandstone.
		Cannonball/Ludlow	500-1,150	550-660	Fine- to medium-grained sandstone, siltstone, and lignite	Generally less than 50 gal/min in sandstone.
Cretaceous	Hell Creek		1,000-1,750	200-300	Claystone, sandstone, and mudstone	5 to 100 gal/min in sandstone.
	Fox Hills		1,100-2,000	200-300	Fine- to medium-grained sandstone and some shale	Generally less than 200 gal/min in sandstone. Some up to 400 gal/min.

Source: Croft (1985) and Klausing (1979). gal/min = gallons per minute

**Table 4. Existing Water Wells Near the Project Area.**

Well Number	Owner	Date Drilled	Section	Township/Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
148-092-03ABA	V. Huntsalong	1969	3	148N / 92W	Domestic	26	Sentinel Butte	15-34H	2.4
148-092-03DBA	Tribal	1950	3	148N / 92W	Unused	510	Unknown	15-34H	2.5
148-092-05	Tribal	1950	5	148N / 92W	Unused	400	Unknown	15-34H	0.5
148-092-05DBC	Keith Mandan	1996	5	148N / 92W	Domestic	62	Unknown	15-34H	0.7
148-092-06AAD	Rita Blackhawk	1981	6	148N / 92W	Domestic	210	Unknown	15-34H	0.4
148-092-06ABB	USGS	1994	6	148N / 92W	Monitoring	200	Unknown	15-34H	0.7
148-092-06ACC	Geraldine VanDike	1996	6	148N / 92W	Stock	450	Unknown	15-34H	0.8
148-092-06BAD	G. VanDike	1967	6	148N / 92W	Domestic/Stock	133	Sentinel Butte	15-34H	0.9
148-092-06BCA	P. VanDike	1971	6	148N / 92W	Stock	89	Sentinel Butte	15-34H	1.0
148-092-06BDB	P. VanDike	1966	6	148N / 92W	Stock	98	Sentinel Butte/ Tongue River	15-34H	1.1
148-092-10AAA2	USGS	1994	10	148N / 92W	Monitoring	108	Unknown	15-34H	2.8
148-092-11CCB	N. Baker	1971	11	148N / 92W	Domestic	100	Sentinel Butte	15-34H	3.3
148-092-23ABB	USGS	1992	23	148N / 92W	Monitoring	290	Tongue River	15-34H	4.4

*Environmental Assessment: Zenergy Operating Company, LLC,  
Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

Well Number	Owner	Date Drilled	Section	Township/Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
148-092-23CCA	NDSWC	1971	23	148N / 92W	Unknown	23	Sentinel Butte/ Tongue River	15-34H	4.8
148-092-23CCA	R. Youngbear	1971	23	148N / 92W	Domestic	50	Sentinel Butte	15-34H	4.8
148-093-01ADD	Geraldine VanDyke	2000	1	148N / 93W	Domestic	548	Unknown	15-34H	1.4
148-093-04	Pat Fredericks	1985	4	148N / 93W	Domestic	71	Unknown	36-35H	1.4
148-093-04CAB1	NDSWC	1973	4	148N / 93W	Monitoring	340	Tongue River	36-35H	1.6
148-093-04CAB2	NDSWC	1973	4	148N / 93W	Monitoring	190	Sentinel Butte Tongue River	36-35H	1.6
148-093-05CCA1	O. Standish	Unknown	5	148N / 93W	Unused	102	Sentinel Butte	36-35H	2.5
148-093-05CCA2	O. Standish	1968	5	148N / 93W	Domestic	72	Buried Glaciaofluvial	36-35H	2.6
148-093-06CCA	Rudolph Sanders	1981	6	148N / 93W	Stock	120	Unknown	36-35H	3.4
148-093-07ADA	R. Goodbird	Unknown	7	148N / 93W	Unused	Unknown	Unknown	36-35H	3.0
148-093-09BBC	Tribal	1950	9	148N / 93W	Unused	40	Buried Glaciaofluvial	36-35H	2.2
148-093-10CCC	NDSWC	1974	10	148N / 93W	Unused	103	Sentinel Butte	36-35H	2.5
148-093-14CDC	NDSWC	1974	14	148N / 93W	Unused	57	Sentinel Butte	36-35H	3.6
148-093-15ACB	NDSWC	1971	15	148N / 93W	Unknown	40	Unknown	36-35H	2.9

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Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

Well Number	Owner	Date Drilled	Section	Township/Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
148-093-17BBD	J. McKinze	Unknown	17	148N / 93W	Unused	160	Sentinel Butte	36-35H	3.5
148-093-20BCA	Tribal	1950	20	148N / 93W	Unused	450	Unknown	36-35H	4.5
148-094-01DDD	NDSWC	1971	1	148N / 94W	Unused	80	Unknown	36-35H	3.7
148-094-02	Garland Beston	1982	2	148N / 94W	Domestic	196	Unknown	16-24H	2.8
148-094-03ABB	Tribal	1950	3	148N / 94W	Unused	450	Unknown	16-24H	2.1
148-094-05BCB	USGS	1994	5	148N / 94W	Monitoring	104	Unknown	16-24H	3.2
148-094-06CBB	Gabe Fetting	2002	6	148N / 94W	Stock	1,848	Unknown	16-24H	4.1
148-094-06DBD	Tribal	Unknown	6	148N / 94W	Stock	Unknown	Sentinel Butte Tongue River	16-24H	3.7
148-094-11AAA2	USGS	1994	11	148N / 94W	Monitoring	58	Unknown	16-24H	3.5
148-094-12DCC	USGS	1992	12	148N / 94W	Monitoring	51	Unknown	36-35H	4.5
148-094-13AAD	Tribal	1950	13	148N / 94W	Unused	450	Unknown	36-35H	4.3
148-094-13BBD	R. Hall	1967	13	148N / 94W	Domestic\Stock	30	Sentinel Butte Tongue River	16-24H	4.6
148-094-14AAB	USGS	1992	14	148N / 94W	Monitoring	315	Tongue River	16-24H	4.3
148-094-14DAC	R. Hall	1968	14	148N / 94W	Stock	100	Buried Glaciofluvial	16-24H	4.9

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Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
148-094-15CCC2	USGS	1994	15	148N / 94W	Monitoring	36	Unknown	16-24H	4.9
148-095-01DDB	Tribal	Unknown	1	148N / 95W	Unknown	240	Sentinel Butte	16-24H	4.5
148-095-03	Daryl Young Bird	1985	3	148N / 95W	Domestic	247	Unknown	15-8H	4.8
149-091-30CCD	Tribal	1950	30	149N / 91W	Unknown	375	Unknown	15-34H	2.6
149-091-33BCC	Tribal	Unknown	33	149N / 91W	Unknown	347	Sentinel Butte	15-34H	4.3
149-092-05CCC	Three Affiliated Tribes	Unknown	5	149N / 92W	Stock	570		36-35H	4.6
149-092-10	John Bang	1992	10	149N / 92W	Domestic	118	Unknown	15-34H	4.5
149-092-10	Les Simmioniw	1990	10	149N / 92W	Domestic	190	Unknown	15-34H	4.5
149-092-10AB	Clyde Perzinski	1997	10	149N / 92W	Domestic	140	Unknown	15-34H	4.9
149-092-10AB	Ray Gress	1999	10	149N / 92W	Domestic	180	Unknown	15-34H	4.9
149-092-10D	Kevin Stockert	1989	10	149N / 92W	Domestic	345	Unknown	15-34H	4.2
149-092-10DAC	Ed Burich	1987	10	149N / 92W	Domestic	125	Unknown	15-34H	4.3
149-092-10DB	Jim Danks	1986	10	149N / 92W	Domestic	125	Unknown	15-34H	4.4
149-092-10DD	Skunk Brother - Tom Knutson	1986	10	149N / 92W	Domestic	135	Unknown	15-34H	4.1

*Environmental Assessment: Zenergy Operating Company, LLC,  
Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
149-092-10DD	Skunk Brother - Tom Knutson	1987	10	149N / 92W	Domestic	195	Unknown	15-34H	4.1
149-092-10DDB	Dakota Poultry	1987	10	149N / 92W	Domestic	200	Unknown	15-34H	4.1
149-092-22CDC	R. Smith	Unknown	22	149N / 92W	Unknown	40	Sentinel Butte	15-34H	2.1
149-092-27BA2	USGS	1994	27	149N / 92W	Monitoring	65	Unknown	15-34H	2.0
149-092-29DCC	Tribal	Unknown	29	149N / 92W	Unused	404	Unknown	15-34H	2.5
149-092-30DCB	Ted Lonefight III	2003	30	149N / 92W	Domestic	307	Unknown	15-34H	3.4
149-092-35BDA	Linda Baker	2008	35	149N / 92W	Domestic	433	Unknown	15-34H	0.9
149-093-05CDC	NDSWC	1961	5	149N / 93W	Unknown	84	Sentinel Butte Tongue River	16-24H	3.4
149-093-08DCC	M. Fox	1960	8	149N / 93W	Unknown	500	Sentinel Butte Tongue River	16-24H	2.7
149-093-09ABD	Dale McGrady	1981	9	149N / 93W	Stock	150	Unknown	16-24H	4.0
149-093-09CCC	St. Anthony's Mission	1988	9	149N / 93W	Domestic	440	Unknown	16-24H	3.1
149-093-09CCD	St. Anthony's Mission	1952	9	149N / 93W	Unknown	65	Sentinel Butte Tongue River	16-24H	3.1
149-093-10AAA	Tribal	1950	10	149N / 93W	Unused	450	Unknown	36-35H	4.8
149-093-12AB	Ivan Johnson	1976	12	149N / 93W	Stock	Unknown	Unknown	36-35H	4.3

*Environmental Assessment: Zenergy Operating Company, LLC,  
Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
149-093-14CC	Tribal	Unknown	14	149N / 93W	Unused	432	Sentinel Butte	36-35H	3.0
149-093-14CDD2	USGS	1994	14	149N / 93W	Monitoring	35	Unknown	36-35H	2.8
149-093-16BDD	Paul Rosario	1994	16	149N / 93W	Domestic	450	Unknown	16-24H	3.1
149-093-18DDB	Tribal	Unknown	18	149N / 93W	Unused	465	Sentinel Butte	16-24H	1.5
149-093-21AAD	Gerald Fox	2000	21	149N / 93W	Domestic	99	Unknown	16-24H	3.2
149-093-21DCA	E. Wicker	Unknown	21	149N / 93W	Unknown	35	Sentinel Butte Tongue River	16-24H	2.9
149-093-22CCD	Arla Muzzy	2002	22	149N / 93W	Domestic	92	Unknown	36-35H	3.0
149-093-23ACD	Unknown	Unknown	23	149N / 93W	Unused	34	Sentinel Butte	36-35H	2.3
149-093-24ABB	USGS	1994	24	149N / 93W	Monitoring	35	Unknown	36-35H	2.3
149-093-24AC	Mobile Oil	Unknown	24	149N / 93W	Unknown	11,331	Unknown	36-35H	2.0
149-093-24ACC2	USGS	1994	24	149N / 93W	Monitoring	33	Unknown	36-35H	2.0
149-093-25DDD	Tribal	Unknown	25	149N / 93W	Unused	147	Sentinel Butte	36-35H	0.4
149-093-27ABA	Patricia McKenzie	2004	27	149N / 93W	Domestic	89	Unknown	36-35H	2.5
149-093-27ABA	M. Youngbird	Unknown	27	149N / 93W	Domestic	65	Sentinel Butte	36-35H	2.5

*Environmental Assessment: Zenergy Operating Company, LLC,  
Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
149-093-27BAA	USGS	1994	27	149N / 93W	Monitoring	60	Unknown	36-35H	2.8
149-093-27CAD	USGS	1994	27	149N / 93W	Monitoring	165	Unknown	36-35H	2.5
149-093-34ACA	Tribal	Unknown	34	149N / 93W	Unused	357	Sentinel Butte	36-35H	2.2
149-094-08DCB	Randy Binger	1992	8	149N / 94W	Domestic	195	Unknown	15-8H	0.2
149-094-14	Mandaree School	1994	14	149N / 94W	Monitoring	16	Unknown	16-24H	1.9
149-094-14	Mandaree School	1988	14	149N / 94W	Monitoring	16	Unknown	16-24H	1.9
149-094-14	BIA	2002	14	149N / 94W	Monitoring	29	Unknown	16-24H	1.9
149-094-14	BIA	2002	14	149N / 94W	Monitoring	28	Unknown	16-24H	1.9
149-094-14	BIA	2002	14	149N / 94W	Monitoring	30	Unknown	16-24H	1.9
149-094-14	BIA	2000	14	149N / 94W	Monitoring	25	Unknown	16-24H	1.9
149-094-14ACD	Mike Mason	1973	14	149N / 94W	Domestic	66	Unknown	16-24H	1.9
149-094-14BA	Mandaree 3	1970	14	149N / 94W	Public Supply	1,745	Hell Creek Fox Hills	16-24H	2.3
149-094-15AAA	Sandy Youngbird	2006	15	149N / 94W	Domestic	278	Unknown	15-8H	2.2
149-094-15ABD	Tilly Lone Fight	2005	15	149N / 94W	Domestic	335	Unknown	15-8H	2.0

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Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
149-094-16DDC	Jimmy Stone	1981	16	149N / 94W	Domestic	200	Unknown	15-8H	1.5
149-094-21AAD	NDSWC	1980	21	149N / 94W	Unused	147	Unknown	15-8H	1.7
149-094-22BBB	NDSWC	1980	22	149N / 94W	Unused	140	Unknown	15-8H	1.7
149-094-22BCB	NDSWC	1980	22	149N / 94W	Unused	80	Unknown	15-8H	1.9
149-094-23ACD	USGS	1994	23	149N / 94W	Monitoring	109	Unknown	16-24H	1.2
149-094-23BBA	USGS	1994	23	149N / 94W	Monitoring	58	Unknown	16-24H	1.8
149-094-27	Margaret Wolf	1982	27	149N / 94W	Domestic	63	Unknown	16-24H	2.3
149-094-27ACD	George Wolf	1973	27	149N / 94W	Domestic	36	Unknown	16-24H	2.2
149-094-27CB	NDSWC	1973	27	149N / 94W	Domestic	36	Unknown	16-24H	2.8
149-094-28AAA	USGS	1992	28	149N / 94W	Monitoring	120	Sentinel Butte Tongue River	15-8H	2.4
149-095-12CAA	BIA	1999	12	149N / 95W	Monitoring	20	Unknown	15-8H	2.3
149-095-12CBA	BIA	1999	12	149N / 95W	Monitoring	25	Unknown	15-8H	2.5
149-095-15CBB	NDSWC	1980	15	149N / 95W	Unused	120	Unknown	15-8H	4.7
149-095-16AA	Amerada	1953	16	149N / 95W	Unknown	9,618	Unknown	15-8H	4.8

*Environmental Assessment: Zenergy Operating Company, LLC,  
Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

Well Number	Owner	Date Drilled	Section	Township/Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
149-095-16DAD	NDSWC	1980	16	149N / 95W	Unused	140	Unknown	15-8H	4.8
149-095-23CB	John Kirkland	1988	23	149N / 95W	Stock	166	Unknown	15-8H	3.9
149-095-23CBB	John Kirkland	1988	23	149N / 95W	Stock	140	Unknown	15-8H	3.9
150-093-19ACB	Waterford City	1988	19	150N / 93W	Municipal;	95	Unknown	27-34H	3.6
150-093-31ADD	Tribal	1961	31	150N / 93W	Unknown	336	Sentinel Butte Tongue River	27-34H	4.1
150-094-09ACC	Howard Fettig	2001	9	150N / 94W	Stock	1,617	Unknown	27-34H	2.8
150-094-15ABC	Nick Fox	1962	15	150N / 94W	Unknown	414	Fort Union	27-34H	2.1
150-094-16ACCI	NDSWC	1980	16	150N / 94W	Unused	40	Unknown	27-34H	1.8
150-094-16ACC2	NDSWC	1980	16	150N / 94W	Unused	40	Unknown	27-34H	1.8
150-094-16CAA	Diane Avery	1994	16	150N / 94W	Domestic	250	Unknown	27-34H	1.7
150-094-19BDD	Shane Johnson	2000	19	150N / 94W	Domestic/Stock	175	Unknown	27-34H	2.7
150-094-19BDD	Shane Johnson	2000	19	150N / 94W	Domestic	202	Unknown	27-34H	2.7
150-094-19DD	Veronica Serdahl	1989	19	150N / 94W	Domestic	820	Unknown	27-34H	2.2
150-094-21ABA	Youngwolf	1964	21	150N / 94W	Unknown	380	Fort Union	27-34H	1.2

*Environmental Assessment: Zenergy Operating Company, LLC,  
Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
150-094-22CBA	Youngwolf	1964	22	150N / 94W	Unknown	327	Fort Union	27-34H	0.7
150-094-30AAC	Lawrence Birdsbill	1986	30	150N / 94W	Stock	200	Unknown	27-34H	2.2
150-094-33ACC	USGS	1992	33	150N / 94W	Monitoring	195	Unknown	27-34H	1.3
150-094-33CB	Occidental	1964	33	150N / 94W	Unknown	11,630	Unknown	27-34H	1.7
150-095-14CAD	Dean Levang	1998	14	150N / 95W	Domestic	44	Unknown	27-34H	4.8
150-095-14DAC	Dean Levang	2006	14	150N / 95W	Stock	40	Unknown	27-34H	4.3
150-095-14DAD	Dean Levang	1988	14	150N / 95W	Domestic	65	Unknown	27-34H	4.4
150-095-14DCB	Carol Berwald	1972	14	150N / 95W	Unknown	35	Fort Union	27-34H	4.6
150-095-24DDD	Melvin Johnson	2003	24	150N / 95W	Domestic	420	Unknown	27-34H	3.1

Source: North Dakota State Water Commission (2009).

### 3.3 WETLANDS, HABITAT, AND WILDLIFE

#### 3.3.1 Wetlands

National Wetland Inventory maps maintained by the U.S. Fish and Wildlife Service (USFWS) do not identify any jurisdictional wetlands in the area of the proposed well pads or access roads (USFWS 2009). No wetlands were observed along any access road ROWs or at any of the well sites during surveys conducted in November 2009. No riparian or wetland habitats are anticipated to be directly or indirectly impacted by the proposed access roads or wells.

According to the USFWS National Wetland Inventory database, several palustrine emergent (PEM) wetlands are located between 0.2 and 1.0 mile from the proposed project areas (Table 5). These PEM wetlands would not be impacted as a result of construction, drilling, or production activities associated with the proposed well pads and associated access roads.

**Table 5. Distance and Bearings from Well Pad Locations to PEM Wetlands.**

<b>Well Pad</b>	<b>Distance (mile)</b>	<b>Bearings (degrees)</b>
Dakota-3 Black Hawk #15-34H	0.56	19.72
	0.76	304.37
	0.78	37.85
	0.82	39.05
	0.83	84.71
	0.86	38.59
	0.91	38.01
	0.95	43.29
	0.95	89.87
	0.96	81.24
Dakota-3 Rubia #16-24H	0.97	112.44
	0.20	293.34
	0.24	300.49
	0.30	296.36
	0.33	261.24
	0.34	309.95
	0.39	255.14
	0.42	255.85
	0.52	329.71
	0.54	24.38
	0.65	140.29
	0.75	303.99
	0.76	67.15
	0.82	135.68
0.86	126.28	
0.94	64.15	

*Environmental Assessment: Zenergy Operating Company, LLC,  
Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

<b>Well Pad</b>	<b>Distance (mile)</b>	<b>Bearings (degrees)</b>
Dakota-3 Beaks #36-35H	0.23	54.72
	0.25	326.68
	0.26	305.49
	0.26	331.94
	0.30	275.69
	0.39	260.91
	0.47	265.53
	0.48	90.62
	0.49	2.40
	0.60	91.44
	0.65	92.89
	0.70	41.78
	0.74	251.59
	0.81	357.33
	0.87	250.09
	0.90	112.59
	0.91	117.29
0.92	247.03	
0.93	123.03	
Dakota-3 Stevenson #15-8H	0.74	70.31
	0.77	74.21
	0.83	77.67
	0.93	36.10
Dakota-3 KYW #27-34H	0.53	157.97
	0.55	246.16
	0.57	134.23
	0.61	103.20
	0.64	191.80
	0.67	179.18
	0.67	196.14
	0.69	180.75
	0.69	183.80
	0.69	186.86
	0.69	197.54
	0.71	188.88
	0.72	242.80
	0.75	3.77
	0.79	1.26
	0.82	2.71
	0.83	236.72
0.85	241.75	
0.97	178.74	
1.00	172.79	

### **3.3.2 Wildlife**

Several wildlife species that may exist in Dunn and McKenzie counties are listed as threatened or endangered under the Endangered Species Act (ESA). Listed species in Dunn and McKenzie counties include the black-footed ferret, gray wolf, interior least tern, pallid sturgeon, piping plover, and whooping crane (USFWS 2008). Although delisted in 2007, the bald eagle remains a species of special concern to the BIA and the Department of the Interior, and is effectively treated the same as a listed species. Tribes and states may recognize additional species of concern; such lists are taken under advisement by federal agencies but are not legally binding in the manner of the ESA. Listed species are described below.

#### **Bald Eagle (*Haliaeetus leucocephalus*)**

**Status:** Delisted in 2007

**Likelihood of impact:** May affect, but is not likely to adversely affect

Proposed project areas are located between 4.34 and 7.45 miles from Lake Sakakawea and do not contain suitable nesting/perching habitat, concentrated feeding areas, or other necessary habitat. Though delisted, the bald eagle is afforded some protection under the Migratory Bird Treaty Act (916 USC 703–711) and the Bald and Golden Eagle Protection Act (16 USC 668–668c). No impacts are anticipated.

#### **Black-footed Ferret (*Mustela nigripes*)**

**Status:** Endangered

**Likelihood of impact:** No effect

Several isolated populations are known to exist in the United States. However, this species is presumed extirpated from North Dakota because it has not been observed in the wild for more than 20 years. No impacts are anticipated.

#### **Dakota Skipper (*Hesperia dacotae*)**

**Status:** Candidate

**Likelihood of impact:** May affect, but is not likely to adversely affect

Project areas are maintained for agricultural use including cultivation and pasture land. Therefore, undisturbed native prairie areas with a high diversity of wildflowers and grasses were not observed in the proposed project areas. The absence of suitable habitat makes the presence of Dakota skippers unlikely. No impacts are anticipated.

#### **Golden Eagle (*Aquila chrysaetos*)**

**Status:** Unlisted; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

**Likelihood of impact:** May affect, but is not likely to adversely affect

The golden eagle prefers habitat characterized by open prairie, plains, and forested areas. Usually, golden eagles can be found in proximity to badland cliffs that provide nesting habitat. None of the proposed project areas contain suitable nesting habitat for golden eagles; however, eagle prey species may be present in and around the project area. No impacts are expected as a result of any activities associated with the construction, production, or reclamation of the project areas.

**Gray Wolf (*Canis lupus*)**

**Status:** Endangered

**Likelihood of impact:** No effect

The proposed project areas do not contain suitable habitat for occupation or colonization by gray wolves. Due to the distance of known gray wolf populations in Minnesota, Canada, Montana, and Wyoming, transient wolves are not expected to be present. No impacts are anticipated.

**Interior Least Tern (*Sterna antillarum*)**

**Status:** Endangered

**Likelihood of impact:** May affect, but is not likely to adversely affect

The proposed project areas would be located in upland areas that would not provide suitable nesting habitat for the interior least tern. Key habitat includes sparsely vegetated sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. Interior least tern nests are usually found along the shoreline and islands of Lake Sakakawea. Migrating or foraging interior least terns may transition through the project area; however, no adverse impact is expected as a result of construction, production, or reclamation activities.

**Pallid Sturgeon (*Scaphirhynchus albus*)**

**Status:** Threatened

**Likelihood of impact:** May affect, but is not likely to adversely affect

Activities associated with the construction, production, or reclamation of the proposed project areas are not anticipated to adversely affect water quality and subsequently the pallid sturgeon. Pallid sturgeons prefer turbid, main stem river channels. No proposed project area is closer than 4.34 miles from Lake Sakakawea, which will reduce the likelihood of adverse effects due to activities. No impact is anticipated.

**Piping Plover (*Charadrius melodus*)**

**Status:** Threatened

**Likelihood of impact:** May affect, but is not likely to adversely affect

The entire shoreline of Lake Sakakawea has been designated critical habitat for piping plover. These birds nest on sparsely vegetated shoreline beaches, peninsulas, and islands composed of sand, gravel, or shale. The nearest critical habitat would be greater than or equal to 4.34 miles from the proposed project areas. Individual piping plovers may transition across or forage at the proposed project areas during construction, drilling, production, or reclamation activities. However, no impact is anticipated, though minor impacts could occur as a result of the aforementioned activities.

**Whooping Crane (*Grus americana*)**

**Status:** Endangered

**Likelihood of impact:** May affect, but is not likely to adversely affect

No viable habitat including PEM wetlands is located within the proposed project areas. The lack of suitable foraging and nesting habitat makes the proposed project areas unsuitable for whooping cranes. No impact is anticipated.

The wildlife species listed in Table 6 were observed during field visits to the proposed project areas. All species listed were visually observed by an ecologist during the field survey (i.e., primary observation). Various secondary indicators, including scat, tracks, and animal carcasses, were not observed in the proposed project areas.

The primary impacts to wildlife species will come as a result of the construction of five well pad areas including the reconstruction of existing two-track roads, construction of new access roads, increased vehicular traffic density, drilling activities, and potential commercial production. No impacts to listed species are anticipated because of the low likelihood of their occurrence in the proposed project areas, confirmed by on-site assessments conducted by biologists from SWCA Environmental Consultants (SWCA). Ground clearing might impact habitat for unlisted species, including small birds, small mammals, and other wildlife species. Proposed projects may affect raptor and migratory bird species through direct mortality, habitat degradation, and/or displacement of individual birds. These impacts are regulated in part through the Migratory Bird Treaty Act of 1918 (916 USC 703–711). Fragmentation of native prairie habitat can detrimentally affect grouse species; however, due to the ratio of each project area to the total landscape area, the overall disturbance would be negligible.

**Table 6. Wildlife Observed during Field Surveys at the Proposed Project Areas.**

Well Pad	Common Name	Scientific Name	Observation Type	Habitat
Dakota-3 Black Hawk #15-34H	---	---	---	Mixed grass prairie
Dakota-3 Rubia #16-24H	Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	Primary	Mixed grass prairie
	White-tailed Deer	<i>Odocoileus virginianus</i>	Secondary	
Dakota-3 Beaks #36-35H	---	---	---	Mixed grass prairie
Dakota-3 Stevenson #15-8H	Black-tailed Prairie Dogs	<i>Cynomys ludovicianus</i>	Primary	Mixed grass prairie
Dakota-3 KYW #27-34H	Cottontail Rabbit	<i>Sylvilagus floridanus</i>	Secondary	Mixed grass prairie
	White-tailed Deer	<i>Odocoileus virginianus</i>	Secondary	

Several precautions that may limit or reduce the possible impact to all wildlife species include:

- locating well pads over areas with existing disturbances;
- netting the reserve pit between drilling and reclamation;
- removing any oil found in pits and ponds;
- installing covers under drip buckets and spigots; and
- conducting interim reclamation of at least half the disturbed area.

Reclamation would begin without delay if a well is determined to be unproductive, or upon completion of commercial production. Any wildlife species inhabiting the project area are likely to adapt to changing conditions, and continue to persist without adverse impact.

### **3.4 SOILS**

The proposed project areas are located toward the center of the Williston Basin. The Greenhorn Formation, which consists of thin limestone and dark gray to black organic-rich shale, is found from the surface to a depth of approximately 4,000 feet. The Greenhorn is subdivided into lower and upper intervals of limestone and calcareous shale with a middle interval of shale. Near-surface sediment is of Recent, Pleistocene, or Tertiary age, and includes Sauk, Tippecanoe, Kaskaskia, Absaroka, Zuni, and Tejas Sequences.

#### **3.4.1 Natural Resources Conservation Service Soil Data**

The Natural Resources Conservation Service (NRCS 2009) soil series present on the well pads and access road areas, and the respective acreages, are summarized in Table 7. The acreage shown in Table 7 is based on the spatial extent of soil series combinations derived from NRCS data (Figures 28 through 32), therefore the acreage is approximate and used as a best estimate of soil series distribution at each of the proposed project areas.

The following soil series descriptions represent individual soil series reported to exist within the proposed project area (NRCS 2009). Each individual soil series does not exist individually in the project areas but rather in combination with other soil types.

**Arnegard:** The Arnegard series consists of very deep, well or moderately well drained soils that formed in calcareous loamy alluvium on upland swales, terraces, fans, and foot slopes. Permeability is moderate. Slopes range from 0 to 25 percent. Mean annual air temperature is 42°F, and mean annual precipitation is 14 inches. Most areas are cropped to spring wheat, oats, barley, and hay. Native vegetation is mid, tall, and short grasses such as western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Nasella viridula*), big bluestem (*Andropogon gerardii*), and blue grama (*Bouteloua gracilis*) (NRCS 2009).

**Amor:** The Amor series consists of well drained, moderately permeable soils that are moderately deep to soft sandstone bedrock. They formed in material weathered from stratified soft sandstone, siltstone, and mudstone. These soils are on uplands and have slopes of 0 to 25

percent. Mean annual temperature is 42°F, and mean annual precipitation is 15 inches. Most areas are commonly cropped to small grains, flax, corn, hay, and grass in a summer crop fallow rotation. Native vegetation is mid and short prairie grasses such as green needlegrass, needle and thread (*Hesperostipa comata*), western wheatgrass, and blue grama (NRCS 2009).

**Badland:** Badland is moderately steep to very steep barren land dissected by many intermittent drainage channels. Ordinarily, the areas are not stony. Badland is most common in semiarid and arid regions where streams cut into soft geologic material. Local relief generally ranges between 10 and 200 meters. Potential runoff is very high, and erosion is active (NRCS 2009).

**Beisigl:** The Beisigl series consists of moderately deep, somewhat excessively drained, rapidly permeable soils on uplands. These soils formed in sandy materials weathered from soft sandstone. Slope ranges from 0 to 50 percent. Mean annual air temperature is 43°F, and mean annual precipitation is 15 inches. Most areas of Beisigl soils are used for native range. Some are used for hay, pasture, and cultivated crops. Native vegetation includes needle and thread, prairie sandreed (*Calamovilfa longifolia*), little bluestem (*Schizachyrium scoparium*), and blue grama (NRCS 2009).

**Bowbells:** The Bowbells series consists of very deep, well and moderately well drained soils found on glacial till plains and moraines. Permeability is moderate in the upper portions and moderately slow to slow in the substratum. Slopes range from approximately 0 to 9 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 42°F. This soil type is used for cultivation of small grains. Native vegetation species historically common to this soil type include western wheatgrass, green needlegrass, and big bluestem (NRCS 2009).

**Cabba:** The Cabba series consists of shallow, well drained, moderately permeable soils found on hills, escarpments, and sedimentary plains. The soil slopes broadly range between 2 and 70 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 43°F. The most common vegetation species found on this soil type are little bluestem, green needlegrass, and other various herbs, forbs, and shrub species (NRCS 2009).

**Chama:** The Chama series consists of well drained soils formed in materials weathered from soft siltstone, mudstone, and shale on uplands. These soils are moderately deep to soft siltstone, mudstone, or shale. These soils are moderately or moderately slowly permeable. Slope ranges from 0 to 45 percent. Mean annual air temperature is 42°F, and mean annual precipitation is 15 inches. Soils are cropped to small grains, which are mostly wheat; a significant acreage is in rangeland. The native vegetation is principally western wheatgrass, needle and thread, and blue grama (NRCS 2009).

**Cohagen:** The Cohagen series consists of shallow, well to excessively drained soils formed in materials weathered from soft sandstone bedrock on uplands. These soils have moderate or moderately rapid permeability. Slopes range from 3 to 70 percent. Mean annual air temperature is about 42°F, and mean annual precipitation is about 16 inches. Potential native

vegetation is bluestem, needle and thread, prairie sandreed, upland sedges, and western wheatgrass (NRCS 2009).

**Daglun:** The Daglum series consists of deep and very deep, moderately well- and well-drained, slow to very slowly permeable soils found on swales on upland terraces and foot slopes. Slopes range from approximately 0 to 9 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches, and mean annual air temperature is approximately 42°F. This soil type is used for rangeland foraging and cultivation of small grains. Native vegetation species common to this soil type include western wheatgrass, blue grama, and green needlegrass (NRCS 2009).

**Dogtooth:** The Dogtooth series consists of moderately deep, well drained, very slowly permeable soils found in uplands where the predominant slope is between 0 and 25 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches and mean annual air temperature is approximately 42°F. The most common vegetation species found on this soil type are range and pasture grasses including western wheatgrass and blue grama (NRCS 2009).

**Flasher:** The Flasher series consists of shallow, somewhat excessively drained soils formed in soft sandstone on side slopes, shoulder slopes, and summits of hills and ridges, and on uplands and side slopes of valleys. Permeability is moderately rapid or rapid. Slopes range from 3 to 70 percent. Mean annual precipitation is about 14 inches and mean annual temperature is about 42°F. This soil type is used mainly for range and pasture. Native vegetation is prairie sandreed, blue grama, little bluestem, upland sedges, some creeping cedar (*Pinus pumila*), and other shrubs (NRCS 2009).

**Harriet:** The Harriet series consists of very deep, poorly drained, slowly and very slowly permeable soils that formed in calcareous alluvium. These soils are on low-lying flats, terraces, drainageways, and bottom lands. Slope ranges from 0 to 3 percent. Mean annual air temperature is approximately 42°F, and mean annual precipitation is about 16 inches. Almost all areas of Harriet soils are used for native rangeland or hayland. Native vegetation consists mainly of western wheatgrass, Nuttall's alkaligrass (*Puccinellia nuttalliana*), and inland saltgrass (*Distichlis spicata*) (NRCS 2009).

**Janesburg:** The Janesburg series consists of moderately deep, well drained soils formed in residuum weathered from alkaline, soft shale, siltstone, and mudstone. These soils have slow or very slow permeability. They are on upland plains and have slopes of 0 to 25 percent. Mean annual air temperature is about 42°F, and mean annual precipitation is about 15 inches. This soil type is used for range, pasture, and small grains. Native vegetation is western wheatgrass, blue grama, green needlegrass, sedges, and forbs (NRCS 2009).

**Rock Outcrop:** Rock outcrop consists of exposures of bare bedrock other than lava flows and rock-lined pits. If needed, map units can be named according to the kind of rock: Rock outcrop, chalk; Rock outcrop, limestone; Rock outcrop, gypsum. Many rock outcrops are too small to be delineated as areas on soil maps but can be shown by spot symbols. Some areas

are large, broken by only small areas of soil. Most rock outcrops are hard rock, but some are soft (NRCS 2009).

**Sen:** The Sen series consists of well drained, moderately permeable soils that formed in calcareous siltstone or shale. They are moderately deep to soft bedrock. These soils are on upland plains and have slopes of 0 to 25 percent. Mean annual air temperature is 42°F, and mean annual precipitation is 15 inches. This soil type is used for cultivation of small grains in a crop-summer fallow rotation. Native vegetation is mid and short prairie grasses such as green needlegrass, needle and thread, western wheatgrass, blue grama, and a variety of forbs (NRCS 2009).

**Tally:** The Tally series consists of very deep, well drained soils that formed in material derived from eolian deposits, alluvium, or glaciofluvial deposits. These soils are on stream terraces, alluvial fans, till plains, drainageways, hills, sedimentary plains, and outwash plains. Slopes are 0 to 45 percent. Mean annual precipitation is about 15 inches, and mean annual temperature is about 43°F. Potential native vegetation is mainly western wheatgrass, needle and thread, prairie junegrass (*Koeleria macrantha*), prairie sandreed, forbs, and shrubs (NRCS 2009).

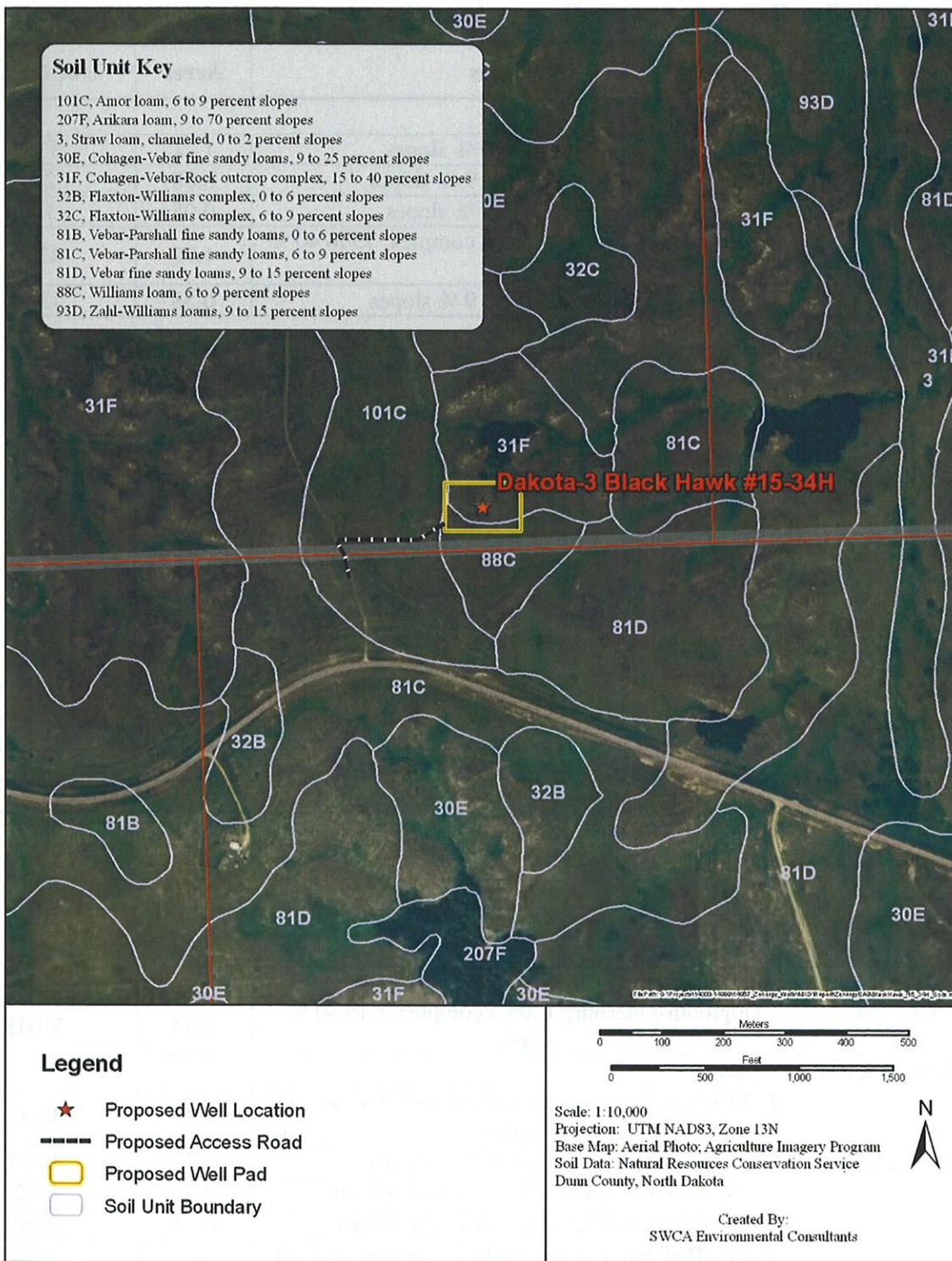
**Vebar:** The Vebar series consists of moderately deep, moderately to rapidly permeable, well-drained soils found on uplands with slopes ranging from approximately 0 to 65 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches, and mean annual air temperature is approximately 42°F. This soil type is largely used for cultivation of corn and small grains. Native vegetation species common to this soil type include needle and thread, and prairie sandreed (NRCS 2009).

**Williams:** The Williams series consists of very deep, slowly permeable, well drained soils found on glacial till plains and moraines with slopes at approximately 0 to 35 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 40°F. This soil type is largely used for cultivation. Native vegetation species common to this soil type include western wheatgrass, needle and thread, blue grama, and green needlegrass (NRCS 2009).

**Zahl:** The Zahl series consists of very deep, slowly permeable, well drained soils found on glacial till plains, moraines, and valley side slopes at approximately 1 to 60 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 40°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include western wheatgrass, little bluestem, and needle and thread (NRCS 2009).

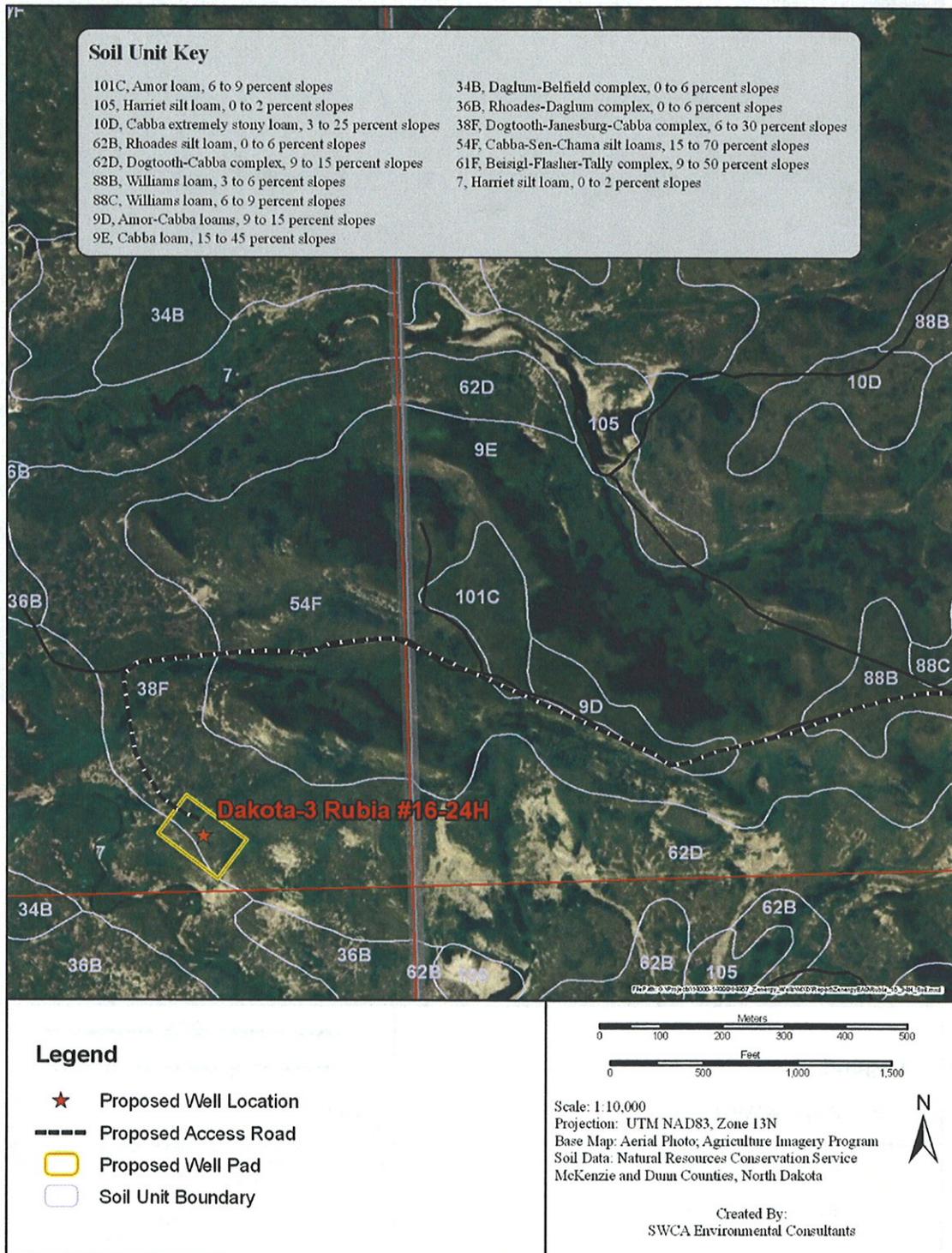
**Table 7. Percentage of the Project Area Composed of Specific Soil Types.**

<b>Feature</b>	<b>Soil Series</b>	<b>Acres</b>	<b>% of Location</b>
<b>Dakota-3 Black Hawk #15-34H</b>			
Access Road	Amor loam, 6 to 9 % slopes	1.21	33.23
	Williams loam, 6 to 9 % slopes	0.08	2.16
Well Pad	Amor loam, 6 to 9 % slopes	0.05	1.32
	Cohagen-Vebar-Rock outcrop complex, 15 to 40 % slopes	1.72	47.34
	Williams loam, 6 to 9 % slopes	0.58	15.95
<b>Dakota-3 Rubia #16-24H</b>			
Access Road	Amor loam, 6 to 9 % slopes	0.29	1.79
	Amor-Cabba loams, 9 to 15 % slopes	0.97	6.12
	Cabba loam, 15 to 45 % slopes	2.56	16.10
	Cabba-Sen-Chama silt loams, 15 to 70 % slopes	1.57	9.88
	Dogtooth-Janesburg-Cabba complex, 6 to 30 % slopes	2.27	14.28
	Williams loam, 0 to 3 % slopes	0.12	0.76
	Williams loam, 3 to 6 % slopes	4.62	29.06
	Williams loam, 6 to 9 % slopes	1.15	7.20
Well Pad	Dogtooth-Janesburg-Cabba complex, 6 to 30 % slopes	1.79	11.28
	Harriet silt loam, 0 to 2 % slopes	0.56	3.52
<b>Dakota-3 Beaks #36-35H</b>			
Access Road	Arnegard loam, 0 to 2 % slopes	0.33	12.45
Well Pad	Arnegard loam, 0 to 2 % slopes	0.74	27.55
	Daglum silt loam, 0 to 6 % slopes	1.61	60.01
<b>Dakota-3 Stevenson #15-8H</b>			
Access Road	Cabba-Sen-Chama silt loams, 15 to 70 % slopes	0.61	18.32
	Dogtooth-Janesburg-Cabba complex, 6 to 30 % slopes	0.36	10.91
Well Pad	Beisigl-Flasher-Tally complex, 9 to 50 % slopes	0.03	0.76
	Dogtooth-Janesburg-Cabba complex, 6 to 30 % slopes	2.33	70.02
<b>Dakota-3 KYW #27-34H</b>			
Access Road	Cabba-Badland, outcrop-Arikara complex, 9 to 70 % slopes	2.81	36.51
	Williams loam, 6 to 9 % slopes	1.73	22.51
	Williams-Bowbells loams, 3 to 6 % slopes	0.66	8.52
	Williams-Zahl loams, 6 to 9 % slopes	0.15	2.00
Well Pad	Cabba-Badland, outcrop-Arikara complex, 9 to 70 % slopes	2.34	30.37
	Williams loam, 6 to 9 % slopes	0.01	0.09

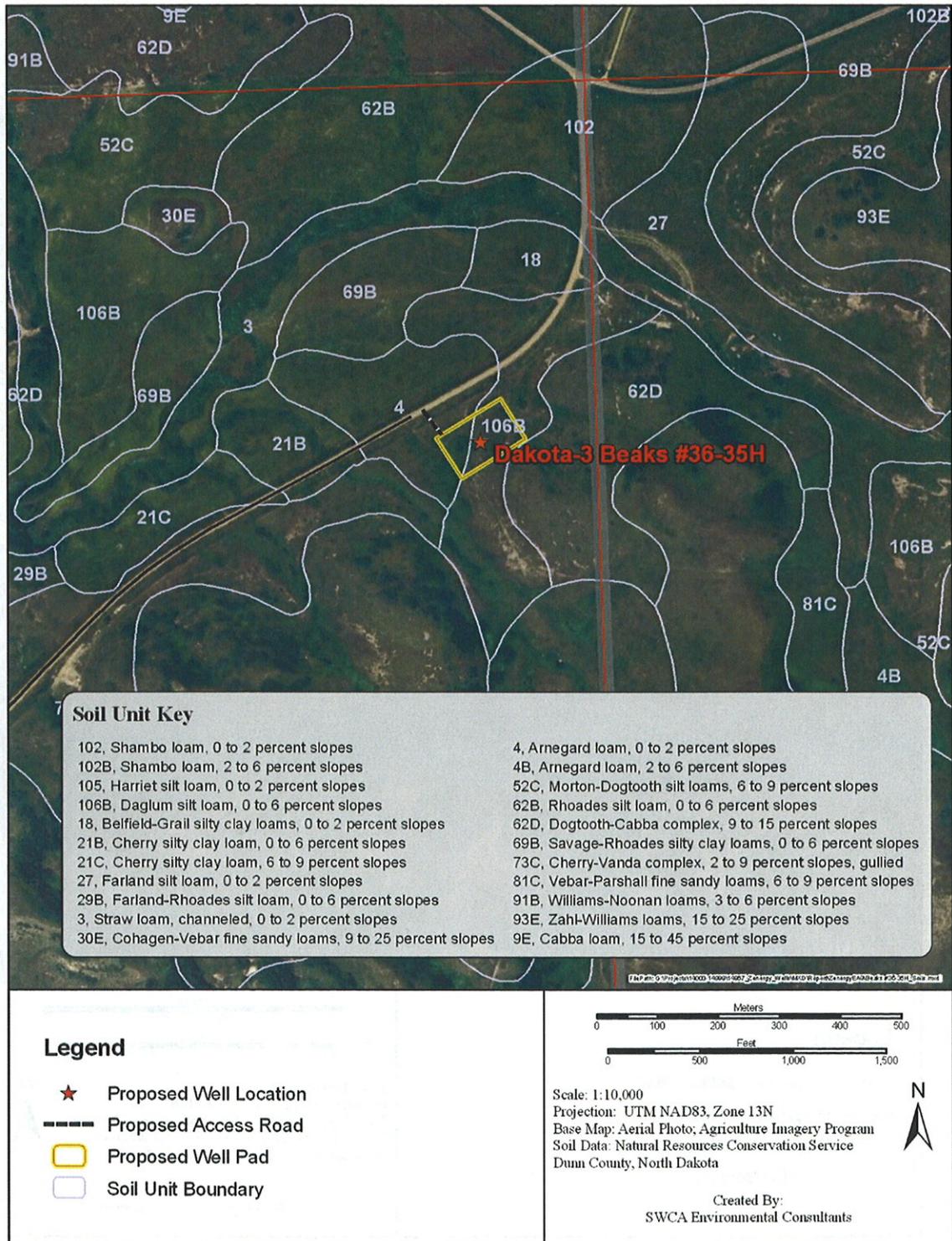


**Figure 28. Approximate spatial extent of soil types in and around  
 Dakota-3 Black Hawk #15-34H.**

*Environmental Assessment: Zenergy Operating Company, LLC,  
Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*



**Figure 29. Approximate spatial extent of soil types in and around  
Dakota-3 Rubia #16-24H.**



**Figure 30. Approximate spatial extent of soil types in and around Dakota-3 Beaks #36-35H.**

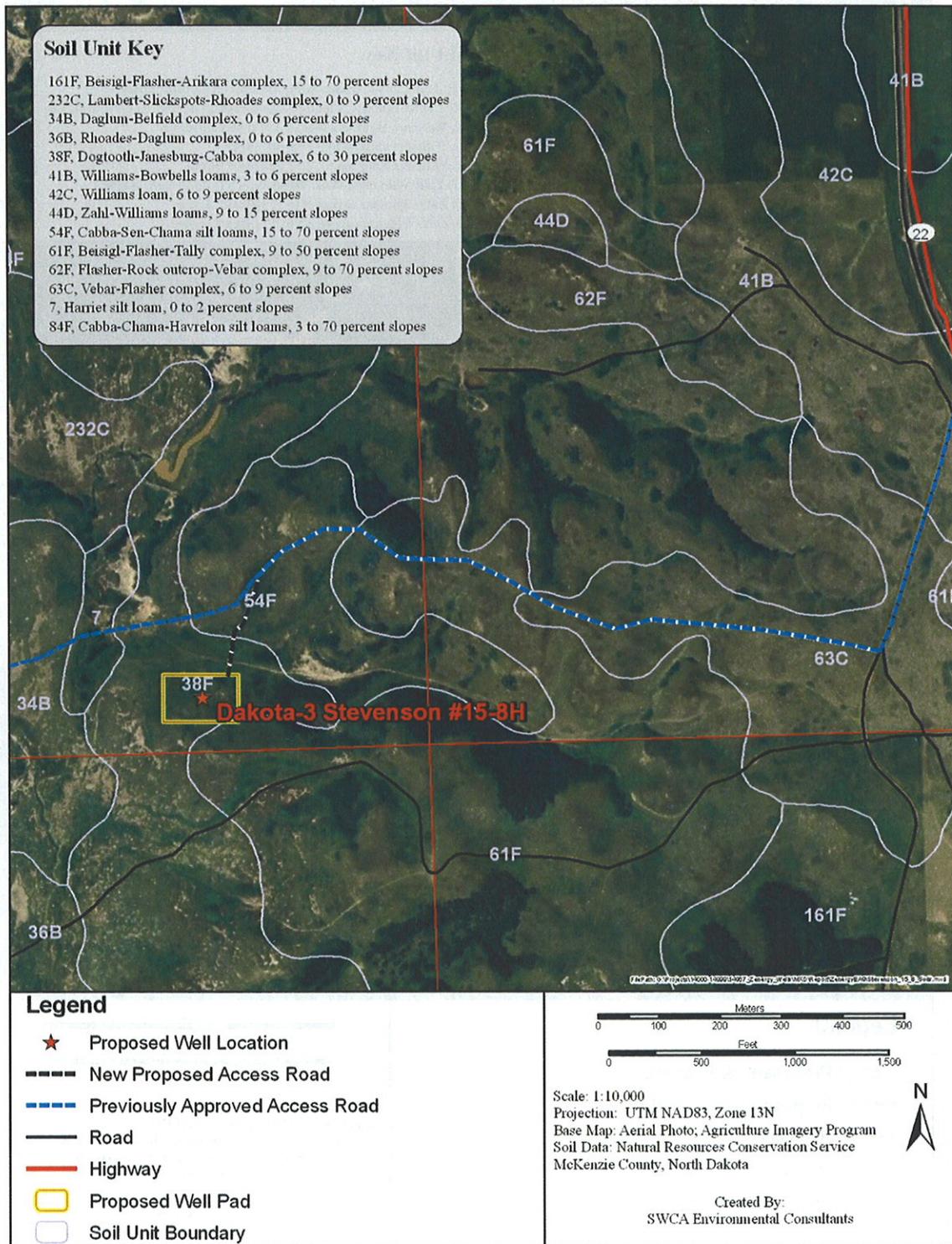
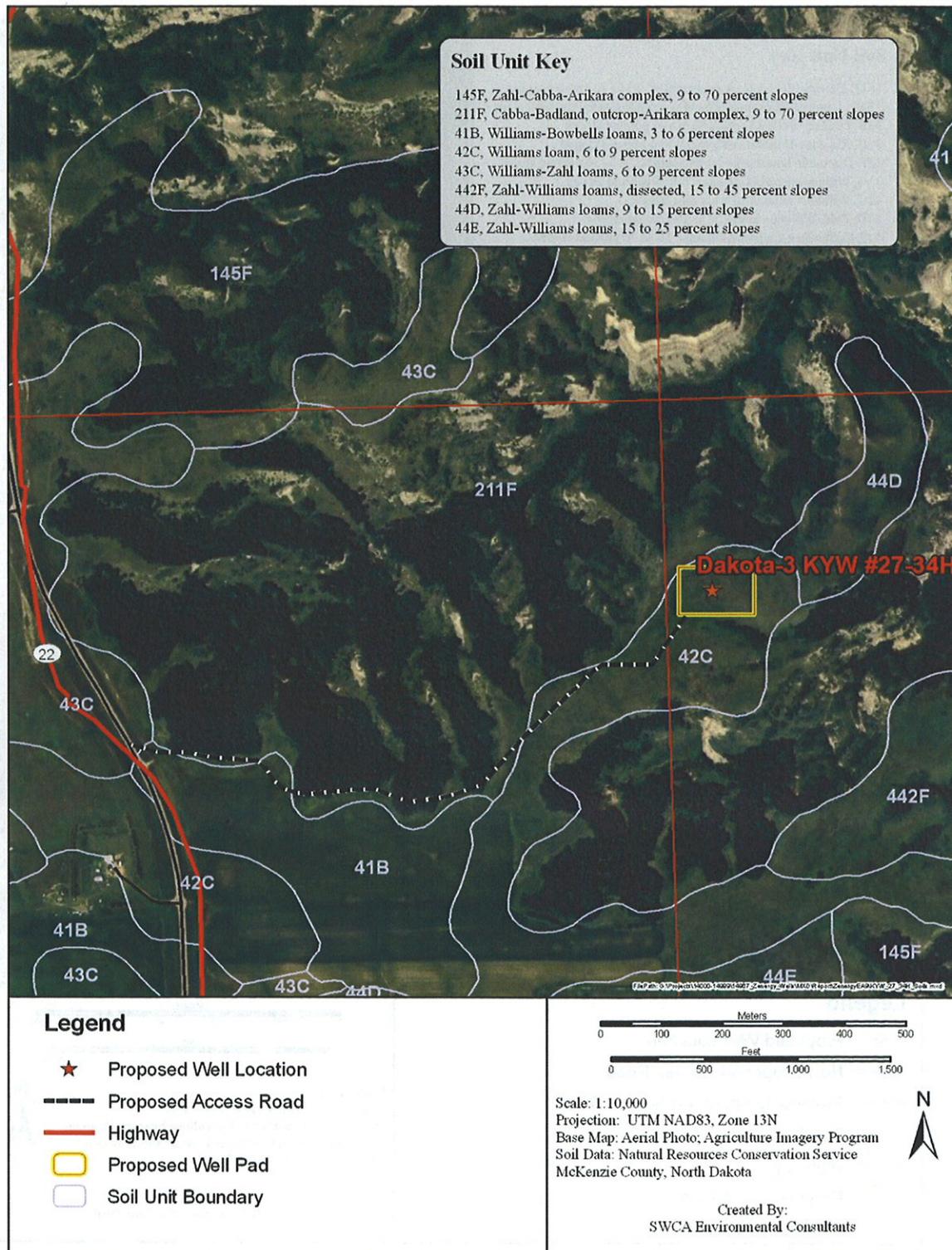


Figure 31. Approximate spatial extent of soil types in and around Dakota-3 Stevenson #15-8H.



**Figure 32. Approximate spatial extent of soil types in and around Dakota-3 KYW #27-34H.**

### **3.4.2 Field-derived Soil Data**

Soil data derived from on-site excavated soil pits, including the matrix value, hue, chroma, and color name, are summarized in Table 8. Additionally, redoximorphic features (i.e., reduced/oxidized iron or manganese) deposits and soil texture were looked for at each location and noted where found. A Munsell soil color chart was used to determine the color of moist soil samples.

Soil erodibility (or K Factor) indicates the vulnerability of material less than 2 millimeters in size to sheet and rill erosion by water. Values can range from 0.02 (i.e., lowest erosion potential) to 0.69 (i.e., greatest erosion potential). T represents the maximum volume of soil loss, measured in tons/acre/year, which could occur and still allow for maintenance of high levels of crop production.

### **3.4.3 Conclusions Regarding Soil Erosion Potential**

#### **3.4.3.1 Dakota-3 Black Hawk #15-34H**

- The Black Hawk #15-34H well pad and proposed new access road are dominated by Cohagen-Vebar-Rock outcrop complex (47.34%) and Amor loam (33.23%), respectively (Table 7).
- The Cohagen-Vebar-Rock outcrop complex (well pad) has a medium potential for runoff with slopes ranging between 15% and 40% and the Amor loam (access road) has a low potential for runoff with slopes ranging between 6% and 9% (NRCS 2009).
- Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
- This location has a K Factor of 0.24. Using the Revised Universal Soil Loss Equation (RUSLE), there could be 6.69 tons/acre/year of soil loss from the site if it is not properly managed to prevent such loss. The site would be monitored during and after construction, and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.
- Most of the soils are known to support native grassland vegetation, which may substantially increase the probability for successful and permanent reclamation, provided care is taken in areas where the soils are less than ideal for vegetative growth (NRCS 2009).

**Table 8. Soil Data Obtained through the Excavation of Soil Pits in the Proposed Project Area.**

<b>Feature</b>	<b>Depth (inches)</b>	<b>Soil Matrix Color (color name)</b>	<b>Redoximorphic Feature Color</b>	<b>Texture</b>	<b>Slope (°)</b>	<b>K Factor</b>
<b>Dakota-3 Black Hawk #15-34H</b>						
Well Pad	0-20	10 YR 3/2	N/A	Clay loam	2-3	0.24
Access Road	0-20	2.5Y 4/3	N/A	Loam	2-3	0.24
<b>Dakota-3 Rubia #16-24H</b>						
Well Pad	0-10	10 YR 3/2	N/A	Clay loam	2-3	0.28
Well Pad	10-20	(98%) 10 YR 3/2	(2%) 10 YR 5/8	Clay loam	2-3	
Access Road	0-20	10 YR 3/2	N/A	Silt	2-3	0.28
<b>Dakota-3 Beaks #36-35H</b>						
Well Pad	0-18	10 YR 2/1	N/A	Clay loam	3-5	0.32
Well Pad	18-20	(98%) 10 YR 2/1	(2%) 10 YR 5/8	Clay loam	3-5	
Access Road	0-20	10 YR 2/1	N/A	Clay loam	3-5	0.32
<b>Dakota-3 Stevenson #15-8H</b>						
Well Pad	0-10	10 YR 2/1	N/A	Silty clay	3-5	0.28
Well Pad	10-20	10 YR 3/1	N/A	Silty clay	3-5	
Access Road	0-20	10 YR 2/1	N/A	Silty clay	3-5	0.28
<b>Dakota-3 KYW #27-34H</b>						
Well Pad	0-15	10 YR 2/1	N/A	Clay loam	0-2	0.28
Well Pad	15-16	(80%) 10 YR 3/1	(20%) 10 YR 3/2	Clay loam	0-2	
Access Road	0-6	10 YR 3/1	N/A	Sandy clay	0-2	0.28
Access Road	6-14	10 YR 4/2	N/A	Sandy clay	0-2	
Access Road	14-16	(95%) 10 YR 4/2	(5%) 7.5 YR 5/8	Sandy clay	0-2	

3.4.3.2 Dakota-3 Rubia #16-24H

- The Rubia #16-24H well pad and proposed new access road are dominated by Dogtooth-Janesburg-Cabba complex (11.28%) and Williams loam (29.06%), respectively (Table 7).
- The Dogtooth-Janesburg-Cabba complex (well pad) has a medium potential for runoff with slopes ranging between 6% and 30% and the Williams loam (access road) has a low potential for runoff with slopes ranging between 3% and 6% (NRCS 2009).
- Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
- This location has a K Factor of 0.28. Using the RUSLE, there could be 4.66 tons/acre/year of soil loss from the site if it is not properly managed. The site would be monitored during and after construction, and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.
- The soil series are capable of supporting native short and mid grass prairie vegetative communities, which may substantially increase the probability for successful and permanent reclamation (NRCS 2009).

3.4.3.3 Dakota-3 Beaks #36-35H

- The Beaks #36-35H well pad and proposed new access road are dominated by Daglum silt loam (60.01%) and Arnegard loam (12.45%), respectively (Table 7).
- These soil types have low runoff potential, with slopes ranging between 0% and 6% for the Daglum silt loam and 0% and 2% for the Arnegard loam (NRCS 2009).
- Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
- This location has a K factor of 0.32. Using the RUSLE, there could be 2.26 tons/acre/year of soil loss from the site if it is not properly managed. The site would be monitored during and after construction, and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.
- Both soil series are capable of supporting native short and mid grass prairie vegetative communities, which may substantially increase the probability for successful and permanent reclamation (NRCS 2009).

3.4.3.4 Dakota-3 Stevenson #15-8H

- The Stevenson #15-8H well pad and proposed new access road are dominated by Dogtooth-Janesburg-Cabba complex (70.02%) and Cabba-Sen-Chama silt loams (18.32%), respectively (Table 7).
- The Dogtooth-Janesburg-Cabba complex (well pad) has a medium potential for runoff with slopes ranging between 6% and 30% and the Cabba-Sem-Chama silt loams (access road) has a varying potential for runoff with slopes ranging between 15% and 70% (NRCS 2009).

- Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
- This location has a K Factor of 0.28. Using the RUSLE, there could be 4.66 tons/acre/year of soil loss from the site if it is not properly managed. The site would be monitored during and after construction, and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.
- Both soil series are capable of supporting native short and mid grass prairie vegetative communities, which may substantially increase the probability for successful and permanent reclamation (NRCS 2009).

#### 3.4.3.5 Dakota-3 KYW #27-34H

- The KYW #27-34H well pad and proposed new access road are both dominated by the Cabba-Badland, outcrop-Arikara complex (30.37% and 36.52%, respectively) (Table 7).
- The Cabba-Badland, outcrop-Arikara has a varying potential for runoff with slopes ranging between 9% and 70% (NRCS 2009).
- Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
- This location has a K Factor of 0.28. Using the RUSLE, there could be 3.73 tons/acre/year of soil loss from the site if it is not properly managed. The site would be monitored during and after construction, and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.
- Most of the soils are known to support native grassland vegetation, which may substantially increase the probability for successful and permanent reclamation, provided care is taken in areas where the soils are less than ideal for vegetative growth (NRCS 2009).

#### 3.4.3.6 General

Due to the presence of loamy soils and minimal slopes in each of the five proposed project areas, no limitations on construction activities in the project areas are anticipated. The soil types are not expected to create unmanageable erosion issues or interfere with reclamation of the area. Proven BMPs are known to significantly reduce erosion of various types of soil, including those in the project area (BLM Instruction Memorandum 2004-124, [www.blm.gov/bmp](http://www.blm.gov/bmp); BLM and USFS 2007; Grah 1997). Topsoil stripped from areas of new construction would be retained for use during reclamation. Any areas stripped of vegetation during construction would be reseeded once construction activities have ceased. The implementation of BMPs by the operator is projected to reduce and maintain negligible levels of erosion.

### 3.5 VEGETATION AND INVASIVE SPECIES

The proposed project areas occur in the Missouri Plateau Ecoregion (Missouri Slope), which is a western mixed-grass and short-grass prairie ecosystem (Bryce et al. 1998). Native grasses include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), side-oats grama (*Bouteloua curtipendula*), green needlegrass (*Nassella viridula*), and western wheatgrass (*Pascopyrum smithii*). Common wetland vegetation includes various sedge species (*Carex* spp.), bulrush (*Scirpus* spp.), and cattails (*Typha* spp.). Common plant species found in woody draws, coulees, and drainages include chokecherry (*Prunus virginiana*), silver buffaloberry (*Shepherdia argentea*), and western snowberry (*Symphoricarpos occidentalis*).

#### 3.5.1.1 Dakota-3 Black Hawk #15-34H

Vegetation noted at the Black Hawk #15-34H project area includes silver buffaloberry, little bluestem, blacksamson echinacea (*Echinacea angustifolia*), white sagebrush (*Artemisia ludoviciana*), fringed sagewort (*Artemisia frigida*), field sagewort (*Artemisia campestris*), and green needlegrass.

#### 3.5.1.2 Dakota-3 Rubia #16-24H

Vegetation noted at the Rubia #16-24H project area includes the invasive species white sagebrush, western snowberry, fringed sagewort, green needlegrass, silver sagebrush (*Artemisia cana*), silver buffaloberry, field sagewort, and blue grama.

#### 3.5.1.3 Dakota-3 Beaks #36-35H

Vegetation noted at the Beaks #36-35H project area includes downy hawthorn (*Crataegus mollis*), green needlegrass, white sagebrush, western snowberry, fringed sagewort, and field sagewort.

#### 3.5.1.4 Dakota-3 Stevenson #15-8H

Vegetation noted at the Stevenson #15-8H project area includes green needlegrass, western snowberry, white sagebrush, fringed sagewort, downy hawthorn, and chokecherry.

#### 3.5.1.5 Dakota-3 KYW #27-34H

Vegetation noted at the KYW #27-34H project area includes smooth brome (*Bromus inermis*), white sagebrush, fringed sagewort, field brome (*Bromus arvensis*), western snowberry, little bluestem, big bluestem, green needlegrass, field sagewort, silver sagebrush, and silver buffaloberry.

Noxious weeds have the potential to detrimentally affect public health, ecological stability, and agricultural practices. The *North Dakota Century Code* (Chapter 63-01.1) recognizes 12 species as noxious; six species are known to exist in Dunn County and seven in McKenzie County. Table 9 indicates total acreage for each noxious species by county. Additional information is available from the NRCS Plants Database for North Dakota at <http://www.plants.usda.gov>.

**Table 9. Occupied Area for Recognized Noxious Weeds in Dunn and McKenzie Counties, North Dakota.**

Common Name	Scientific Name	County	
		Dunn (acres)	McKenzie (acres)
absinth wormwood	<i>Artemisia absinthium</i>	38,600	43
Canada thistle	<i>Cirsium arvense</i>	32,800	4,300
Dalmatian toadflax	<i>Linaria dalmatica</i>	1	--
diffuse knapweed	<i>Centaurea diffusa</i>	--	--
field bindweed	<i>Convolvulus arvensis</i>	33,000	--
leafy spurge	<i>Euphorbia esula</i>	10,500	1,300
musk thistle	<i>Carduus nutans</i>	2	2
purple loosestrife	<i>Lythrum salicaria</i>	--	--
Russian knapweed	<i>Acroptilon repens</i>	--	1
salt cedar	<i>Tamarix ramosissima</i>	--	1
spotted knapweed	<i>Centaurea stoebe</i>	--	1
yellow starthistle	<i>Centaurea solstitialis</i>	--	--

Source: North Dakota Department of Agriculture 2007.

“Invasive” is a general term used to describe plant species that are not native to a given area, spread rapidly, and have adverse ecological and economic impacts. These species may exhibit high reproductive rates and are usually adapted to occupy a diverse range of habitats otherwise occupied by native species. These species may subsequently out-compete native plant species for resources, causing a reduction in native plant populations and an increase in noxious weed populations.

Evaluation of the existing vegetation during on-site assessments conducted in November 2009 indicated no invasive species were present at any of the proposed sites. However, potential disturbance of approximately 36.5 acres and removal of existing vegetation may facilitate the spread of invasive species. The APD and this EA require the operator to control noxious weeds throughout the project areas. Surface disturbance and vehicular traffic must not take place outside approved ROWs or the well pad. Areas that are stripped of topsoil must be re-seeded and reclaimed at the earliest opportunity. Additionally, certified weed-free straw and seed must be used for all construction, seeding, and reclamation efforts. Prompt and appropriate construction, operation, and reclamation are expected to maintain minimal levels of adverse impacts to vegetation and will reduce the potential establishment of invasive vegetation species.

### **3.6 CULTURAL RESOURCES**

Historic properties, or cultural resources, on federal or tribal lands are protected by many laws, regulations and agreements. The *National Historic Preservation Act of 1966* (16 USC 470 *et seq.*) at Section 106 requires, for any federal, federally assisted or federally licensed undertaking, that the federal agency take into account the effect of that undertaking on any district, site, building, structure or object that is included in the National Register of Historic

Places (National Register) before the expenditure of any federal funds or the issuance of any federal license. Cultural resources is a broad term encompassing sites, objects, or practices of archaeological, historical, cultural and religious significance. Eligibility criteria (36 CFR 60.6) include association with important events or people in our history, distinctive construction or artistic characteristics, and either a record of yielding or a potential to yield information important in prehistory or history. In practice, properties are generally not eligible for listing on the National Register if they lack diagnostic artifacts, subsurface remains or structural features, but those considered eligible are treated as though they were listed on the National Register, even when no formal nomination has been filed. This process of taking into account an undertaking's effect on historic properties is known as "Section 106 review," or more commonly as a cultural resource inventory.

The area of potential effect (APE) of any federal undertaking must also be evaluated for significance to Native Americans from a cultural and religious standpoint. Sites and practices may be eligible for protection under the *American Indian Religious Freedom Act of 1978* (42 USC 1996). Sacred sites may be identified by a tribe or an authoritative individual (Executive Order 13007). Special protections are afforded to human remains, funerary objects, and objects of cultural patrimony under the *Native American Graves Protection and Repatriation Act* (NAGPRA, 25 USC 3001 *et seq.*).

Whatever the nature of the cultural resource addressed by a particular statute or tradition, implementing procedures invariably include consultation requirements at various stages of a federal undertaking. The MHA Nation has designated a Tribal Historic Preservation Officer (THPO) by Tribal Council resolution, whose office and functions are certified by the National Park Service. The THPO operates with the same authority exercised in most of the rest of North Dakota by the State Historic Preservation Officer (SHPO). Thus, BIA consults and corresponds with the THPO regarding cultural resources on all projects proposed within the exterior boundaries of the Fort Berthold Reservation.

Cultural resource inventories of these well pads and access roads were conducted by personnel of SWCA Environmental Consultants, using a pedestrian methodology. For the D-3 Black Hawk #15-34H project approximately 35.6 acres were intensively inventoried between October 28 and November 4, 2009 (Rose and Lechert 2010). For the D-3 Beaks #36-35H project approximately 10.13 acres were inventoried (Lechert 2010a) and for the D-3 Stevenson #15-8H (formerly D-3 Stevenson #16-8H) project approximately 10.67 acres were inventoried (Lechert 2010b) on November 16, 2009; for the D-3 Rubia #16-24H project approximately 28.4 acres were inventoried between November 16-18, 2009 (Lechert 2010c); and for the D-3 KYW #27-34H project approximately 19.51 acres were inventoried on November 20, 2009 (Lechert 2010d). Although one archaeological site was located in these inventories which may possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register, the project has been redesigned so as to avoid this site. Thus, as the lead federal agency, and as provided for in 36 CFR 800.5, on the basis of the information provided, BIA reached a determination of **no historic properties affected** for these undertakings. This determination was communicated to the THPO on

January 26, 2010; however, no response was received from the THPO within the allotted 30-day comment period (see Part 4).

### **3.7 SOCIOECONOMICS**

The scope of analysis for social and economic resources includes a discussion of current social and economic data relevant to the Analysis Area and surrounding communities of the Reservation and McKenzie, Dunn, McLean, and Mountrail counties, North Dakota. These counties were chosen for analysis because potential socioeconomic impacts would most likely be realized due to their proximity to the proposed well locations and overlap of the Reservation. These communities are collectively referred to as the Analysis Area.

This section discusses community characteristics such as population, housing, demographics, employment, and economic trends within the Analysis Area. Also included are data relating to the State of North Dakota and the United States, which provide a comparative discussion when compared to the Analysis Area. Information in this section was obtained from various sources including, but not limited to, the U.S. Census Bureau, the U.S. Bureau of Economics, and the North Dakota State government.

#### **3.7.1 Employment**

The economy in the State of North Dakota, including the Reservation and four counties in the Analysis Area, has historically depended on agriculture, including grazing and farming. However, energy development and extraction, power generation, and services related to these activities have increased over the last several years. Consequently, service and trade sectors have also become increasingly important; many of the service sector jobs are directly and indirectly associated with oil and gas development. In 2007, total employment in the State of North Dakota was approximately 487,337 (U.S. Bureau of Economic Analysis 2009a). Of this, the largest employers include government and government enterprises employing 16.6% of the labor force (81,218 jobs); health care and social assistance at 11.7% of the labor force (56,990 jobs); and retail trade at 11.3% of the labor force (55,478 jobs) (U.S. Bureau of Economic Analysis 2009a). Table 10 provides total employment opportunities for the Analysis Area between 2001 and 2007.

**Table 10. Total Employment for the Analysis Area and State of North Dakota, 2001 and 2007.**

<b>Location</b>	<b>Total Employment (2001)</b>	<b>Total Employment (2007)</b>	<b>Percent Change (+)</b>	<b>Unemployment Rate (2007)</b>
Dunn County	1,941	1,961	1.0	3.8%
McKenzie County	4,164	4,600	10.4	3.1%
McLean County	5,173	5,448	5.3	4.6%
Mountrail County	3,691	3,711	0.5	5.7%
On or Near Fort Berthold Reservation	1,211	1,287*	6.2	71%
North Dakota	448,897	487,337	8.5	3.1%

Source: U.S. Bureau of Economic Analysis 2009a.

\* Bureau of Indian Affairs 2005. Represents 2005 data.

Although detailed employment information for the Reservation is not provided by the U.S. Bureau of Economics or the State of North Dakota, residents of the Reservation are employed in similar ventures as those outside the Reservation. Typical employment includes ranching, farming, tribal government, tribal enterprises, schools, federal agencies, and recently, employment related to conventional energy development. The MHA Nation's Four Bears Casino and Lodge, located 4 miles west of New Town, employs approximately 320 people, of which 90% are tribal members (Fort Berthold Housing Authority 2008).

The Fort Berthold Community College, which is tribally chartered to meet the higher education needs of the people of the MHA Nation, had 11 full-time members and 25 adjunct members in academic year 2006–2007. Approximately 73% of the full-time faculty members are of American Indian/Alaska Native descent, approximately 88% of which are enrolled members of the MHA Nation. Additionally, 65% of the part-time faculty members are of American Indian/Alaska Native descent and all (100%) are tribal members.

The BIA publishes biannual reports documenting the Indian service and labor market for the nation. According to the 2005 American Indian Population and Labor Force Report, of the 8,773 tribal members that were eligible for BIA-funded services, 4,381 constituted the total available workforce. Approximately 29%, or 1,287 members, were employed in 2005, indicating a 71% unemployment rate (as a percent of the labor force) for members living on or near the Reservation; 55% of the employed members were living below poverty guidelines. Compared to the 2001 report, 2005 statistics reflect a 6.2% increase in the number of tribal members employed living on or near the Reservation, but unemployment (as a percent of the labor force) has stayed steady at 71% and the percentage of employed people living below the poverty guidelines has increased to 55% (Bureau of Indian Affairs 2005).

### **3.7.2 Income**

Per capita income is often used as a measure of economic performance, but it should be used with changes in earnings for a realistic picture of economic health. Since total personal income includes income from 401(k) plans as well as other non-labor income sources like transfer payments, dividends, and rent, it is possible for per capita income to rise even if the average wage per job declines over time.

The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. According to NAICS standards, per capita personal income for Dunn County was \$20,634 in 2000 and \$26,440 in 2007, an increase of approximately 28.1%; per capita personal income for McKenzie County was \$21,637 in 2000 and \$32,927 in 2007, an increase of approximately 52.1%; per capita personal income for McLean County was \$23,001 in 2000 and \$38,108 in 2007, an increase of approximately 65.6%; per capita personal income for Mountrail County was \$23,363 in 2000 and \$32,324 in 2007, an increase of approximately 38.3%. These figures compare with a State of North Dakota per capital personal income of \$25,105 in 2000 and \$36,082 in 2007, an increase of approximately 43.7% from 2000 (U.S. Bureau of Economic Analysis 2009b).

According to a 2008 report published by the Fort Berthold Housing Authority, the average per capita income for the Reservation was \$8,855 in 1999, compared to \$17,769 for the State and the U.S. average of \$21,587 at that time (Fort Berthold Housing Authority 2008).

With the exception of McLean County, counties that overlap the Reservation tend to have per capita incomes and median household incomes below North Dakota statewide averages (Table 11). As presented in Table 10, unemployment rates in all counties, including the Reservation, were equal to or above the state average of 3.1%. Subsequently, Reservation residents and MHA Nation members tend to have per capita incomes and median household incomes below the averages of the encompassing counties, as well as statewide and higher unemployment. Per capita income for residents on or near the Reservation is approximately 28% lower than the statewide average. The median household income reported for the Reservation (i.e., \$26,274) is approximately 40% lower than the state median of \$43,936. According to the BIA, approximately 55% of tribal members living on or near the Reservation were employed, but living below federal poverty levels (BIA 2005).

**Table 11. Income and Unemployment 2007.**

Unit of Analysis	Per Capita Income <sup>1</sup>	Median Household Income	Percent of All People in Poverty <sup>2</sup>
Dunn County	26,440	\$37,632	13.5%
McKenzie County	32,927	\$41,333	13.8%
McLean County	38,108	\$44,421	10.4%
Mountrail County	32,324	\$35,981	15.9%
Fort Berthold Reservation <sup>3</sup>	10,291	\$26,274	N/A
North Dakota	36,082	\$43,936	11.8%

<sup>1</sup> U.S. Bureau of Economic Analysis 2009b

<sup>2</sup> United States Department of Agriculture (USDA) 2009

<sup>3</sup> North Dakota State Data Center 2009

N/A = Data not available.

### **3.7.3 Population**

Historic and current population counts for the Analysis Area, compared to the state, are provided below in Table 12. The state population showed little change between the last two census counts (1990–2000), but there were notable changes at the local level. Populations in all four counties have steadily declined in the past. McLean and Dunn counties had a higher rate of population decline among the four counties at 10.5% and 7.8%, respectively. These declines can be attributed to more people moving to metropolitan areas, which are perceived as offering more opportunities for growth. However, population on or near the Reservation has increased approximately 13.3% since 2000. While Native Americans are the predominant group on the Reservation, they are considered the minority in all other areas of North Dakota.

As presented in Table 12, population growth on the Reservation (13.3%) exceeds the overall growth in the state of North Dakota (-0.1%) and four counties in the Analysis Area. This trend in population growth for the Reservation is expected to continue in the next few years (Fort Berthold Housing Authority 2008).

### **3.7.4 Housing**

Workforce-related housing can be a key issue associated with development. Historical information on housing in the four counties in the Analysis Area was obtained from the U.S. Census Bureau, 2000 census. Because the status of the housing market and housing availability changes often, current housing situations can be difficult to characterize quantitatively. Therefore, this section discusses the historical housing market. Table 13 provides housing unit supply estimates in the Analysis Area, including the Reservation and four overlapping counties.

**Table 12. Population and Demographics.**

County or Reservation	Population in 2008	% of State Population	% Change Between 1990–2000	% Change Between 2000–2008	Predominant Group (%)	Predominant Minority (Percent of Total Minority Population)
Dunn	3,318	0.5	-10.1	-7.8	Caucasian (84.9%)	American Indian (15.1%)
McKenzie	5,674	0.8	-10.1	-1.1	Caucasian (76.3%)	American Indian (23.7%)
McLean	8,337	1.3	-11.0	-10.5	Caucasian (91.3%)	American Indian (8.7%)
Mountrail	6,511	1.0	-5.6	-1.8	Caucasian (62.8%)	American Indian (37.2%)
On or Near Fort Berthold Reservation <sup>1</sup>	11,897	1.8	178.0 <sup>2</sup>	13.3 <sup>3</sup>	American Indian	Caucasian (~27%)
Statewide	641,481	100	0.005	-0.1	Caucasian	American Indian (8.6%)

Source: U.S. Census Bureau 2009a.

<sup>1</sup> Bureau of Indian Affairs 2005. Population shown reflects the Total enrollment in the Tribe in 2005. 2008 data unavailable. All information related to the Fort Berthold Reservation reflects 2005 data, including state population. 11,897 reflects tribal enrollment on or near the Reservation. According to the BIA, near the Reservation includes those areas or communities adjacent or contiguous to the Reservation.

<sup>2</sup> Bureau of Indian Affairs 2001. Reflects percent change between 1991 and 2001.

<sup>3</sup> Reflects percent change between 2001 and 2005.

**Table 13. Housing Development Data for the Reservation and Encompassing Counties.**

Region	Total Housing Units						% Change 2000–2008
	Occupied	Owner Occupied	Renter Occupied	Vacant	Total	Total	
	2000	2000	2000	2000	2000	2008	
Dunn	1,378	1,102	276	587	1,965	1,968	0.1
McKenzie	2,151	1,589	562	568	2,719	2,781	2.2
McLean	3,815	3,135	680	1,449	5,264	5,420	2.9
Mountrail	2,560	1,859	701	878	3,438	3,528	2.6
Reservation	1,908	1,122	786	973	2,881	N/A	N/A
North Dakota	257,152	171,299	85,853	32,525	289,677	313,332	8.2

Source: U.S. Census Bureau n.d.

The Fort Berthold Housing Authority manages a majority of the housing units within the Reservation. Housing typically consists of mutual-help homes built through various government programs, low-rent housing units, and scattered-site homes. Housing for government employees is limited, with a few quarters in Mandaree and White Shield available to Indian Health Service employees in the Four Bears Community and to BIA

employees. Private purchase and rental housing are available in New Town. New housing construction has recently increased within much of the Analysis Area, but availability remains low.

Availability and affordability of housing could impact oil and gas development and operations. The number of owner-occupied housing units (1,122) within the Reservation is approximately 58% lower than the average number of owner-occupied housing units found in the four overlapping counties (1,921).

In addition to the relatively low percent change of the total housing units compared to the state average, these four counties are ranked extremely low for both the state and national housing starts and have minimal new housing building permits, as presented in Table 14.

**Table 14. Housing Development Data for the Encompassing Counties 2000–2008.**

Housing Development	North Dakota County			
	Dunn	McKenzie	McLean	Mountrail
New Private Housing Building Permits 2003–2008	14	14	182	110
Housing Starts-State Rank	51 / 53	15 / 53	21 / 53	17 / 53
Housing Starts-National Rank	3,112 / 3,141	2,498 / 3,141	2,691 / 3,141	2,559 / 3,141

Source: U.S. Census Bureau 2009b, 2009c.

Impacts to socioeconomic resources of the Analysis Area would be minimal and therefore would not adversely impact the local area. Short-term impacts to socioeconomic resources would generally occur during the construction/drilling and completion phase of the proposed wells. Long-term effects would occur during the production phase, should the wells prove successful. Impacts would be significant if the affected communities and local government experienced an inability to cope with changes including substantial housing shortages, fiscal problems, or breakdown in social structures and quality of life.

As presented in Table 15, implementation of the proposed five wells is anticipated to require between 14 and 28 workers per well in the short term. If the wells prove successful, Zenergy would install production facilities and begin long-term production. To ensure successful operations, production activities require between one and four full-time employees to staff operations. It is anticipated that a mix of local and Zenergy employees would work in the Analysis Areas. Therefore, any increase in workers would constitute a minor increase in population in the Analysis Area required for short-term operations and therefore would not create a noticeable increase in demand for services or infrastructure on the Reservation or the communities near the Analysis Area, including McKenzie and Dunn counties. Because the communities likely impacted by the proposed project have experienced a recent decline in population between 2000 and 2008 (as shown in Table 12), with the exception of the Reservation itself, and the historic housing vacancy rate (Table 13) indicates housing availability despite the growth of the population on the Reservation, these communities are able to absorb the projected slight increase in population related to this proposed project. As such, the proposed project would not have measurable impacts on housing availability or

community infrastructure in the area. The proposed project also would not result in any identifiable impacts to social conditions and structures within the communities in the Analysis Area.

**Table 15. Duration of Employment during Proposed Project Implementation.**

Activity	Duration of Activity (Average Days per Well)	Daily Personnel (Average Number per Well)
Construction (access road and well pad)	5–8 days	3–5
Drilling	30–35 days	8–15
Completion/Installation of Facilities	Approx. 10 days	3–8
Production	Ongoing – life of well	1–4

Implementation of the proposed project would likely result in direct and indirect economic benefits associated with industrial and commercial activities in the area, including the Reservation, State of North Dakota, and potentially local communities near the Reservation. Direct impacts would include increased spending by contractors and workers for materials, supplies, food, and lodging in McKenzie and Dunn counties and the surrounding areas, which would be subject to sales and lodging taxes. Other state, local, and Reservation tax payments and fees would be incurred as a result of the implementation of the proposed project, with a small percentage of these revenues distributed back to the local economies. Wages due to employment would also impact per capita income for those that were previously unemployed or underemployed. Indirect benefits would include increased spending from increased oil and gas production, as well as a slight increase in generated taxes from the short-term operations. Mineral severance and royalty taxes, as well as other relevant county and Reservation taxes on production would also grow directly and indirectly as a result of increased industrial activity in the oil and gas industry.

### **3.8 ENVIRONMENTAL JUSTICE**

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, signed in 1994 by President Clinton, requires agencies advance environmental justice (EJ) by pursuing fair treatment and meaningful involvement of minority and low-income populations. Fair treatment means such groups should not bear a disproportionately high share of negative environmental consequences from federal programs, policies, decisions, or operations. Meaningful involvement means federal officials actively promote opportunities for public participation, and federal decisions can be materially affected by participating groups and individuals.

The EPA headed the interagency workgroup established by the 1994 Executive Order and is responsible for related legal action. Working criteria for designation of targeted populations are provided in *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses* (EPA 1998). This guidance uses a statistical approach to consider various geographic areas and scales of analysis to define a particular population's status under Executive Order 12898.

EJ is an evolving concept with potential for disagreement over the scope of analysis and the implications for federal responsiveness. Nevertheless, due to the population numbers, tribal members on the Great Plains qualify for EJ consideration as both a minority and low-income population. Table 16 summarizes relevant data regarding minority and low-income populations for the Analysis Area.

**Table 16. Population Breakdown by Region and Race, 2002–2008.**

Race	Dunn		McKenzie		McLean		Mountrail		North Dakota	
	2002	2008	2002	2008	2002	2008	2002	2008	2002	2008
Caucasian	3,067	2,818	4,493	4,329	8,313	7,610	4,480	4,086	587,085	586,272
African American	1	2	4	30	1	9	8	27	4,931	6,956
American Indians and Alaska Natives	469	467	1,175	1,230	558	587	1,949	2,277	31,104	35,666
Asian / Pacific Islanders	4	3	4	10	17	19	17	20	4,679	5,095
Two or More Races	1	28	32	75	118	112	68	101	6,311	7,492
All Minorities	475	500	1,215	1,345	694	727	2,042	2,425	47,025	55,209

Source: Northwest Area Foundation 2009.

In 2008, North Dakota’s total minority population comprised approximately 55,209, or 8.6% of the state’s total population. This is an increase of approximately 17.4% over the 2002 minority population numbers, compared with the 1.2% overall increase for the state’s total population during the same time. Although 91.3% of the population in North Dakota is classified as Caucasian, this is a decrease of 1.3% from 2002. Conversely, as presented in Table 16, the minority population of the state has increased steadily since 2002. For example, the American Indian and Alaska Native population increased 0.6%, from 4.9% of the 2002 state population to 5.5% of the 2008 state population. Approximately 70% of Reservation residents are tribal members and 14% of the Dunn County population and 21.6% of the McKenzie County population comprises American Indians and Alaska Natives.

Poverty rate data for the counties in the Analysis Area are summarized in Table 17. The data show that poverty rates for Dunn County, Mountrail County, and the State of North Dakota increased from 2000 to 2007. Poverty rates have decreased for McKenzie and McLean counties.

**Table 17. Poverty Rates for the Analysis Area.**

Location	2000	2007
Dunn County	13.3%	13.5%
McKenzie County	15.7%	13.8%
McLean County	12.3%	10.4%
Mountrail County	15.7%	15.9%
Fort Berthold Reservation	N/A	N/A
North Dakota	10.4%	11.8%

Source: U.S. Census Bureau 2009d.

Generally, existing oil and gas leasing has already benefited the MHA Nation government and infrastructure from tribal leasing, fees, and taxes. Current oil and gas leasing on the Reservation has also already generated revenue to MHA Nation members who hold surface and/or mineral interests. However, owners of allotted surface within the Analysis Area may not necessarily hold mineral rights. In such cases, surface owners do not receive oil and gas lease or royalty income, and their only related income would be compensation for productive acreage lost to road and well pad construction. Those with mineral interests also may benefit from royalties on commercial production if the wells prove successful. Profitable production rates at proposed locations might lead to exploration and development of additional tracts owned by currently non-benefitting allottees. In addition to increased revenue for land and mineral holders, exploration and development would increase employment on the Reservation with oversight from the Tribal Employment Rights Office, which would help alleviate some of the poverty prevalent on or near the Reservation. Tribal members without either surface or mineral rights would not receive any direct benefits, except through potential employment, should they be hired. Indirect benefits of employment and general tribal gains would be the only potential offsets to negative impacts.

Additional potential impacts to tribes and tribal members include disturbance of cultural resources. There is potential for disproportionate impacts, especially if the impacted tribes and members do not reside within the Reservation and therefore do not share in direct or indirect benefits. This potential is reduced following the surveys of proposed well locations and access road routes and determination by the BIA that there would be no effect to historic properties. Furthermore, nothing is known to be present that qualifies as a TCP or for protection under the American Indian Religious Freedom Act. Potential for disproportionate impacts is further reduced by requirements for immediate work stoppage following an unexpected discovery of cultural resources of any type. Mandatory consultation would take place during any such work stoppage, affording an opportunity for all affected parties to assert their interests and contribute to an appropriate resolution, regardless of their home location or tribal affiliation.

The proposed project has not been found to pose a threat for significant impact to any other critical element, including air quality, public health and safety, water quality, wetlands, wildlife, soils, or vegetation within the human environment. Through the avoidance of such impacts, no disproportionate impact is expected to low-income or minority populations. The Proposed Action offers many positive consequences for tribal members, while recognizing EJ

concerns. Procedures summarized in this document and in the APD are binding and sufficient. No laws, regulations, or other requirements have been waived; no compensatory mitigation measures are required.

### **3.9 MITIGATION AND MONITORING**

Many protective measures and procedures are described in this document and in the APD. No laws, regulations, or other requirements have been waived; no compensatory mitigation measures are required. Monitoring of cultural resource impacts by qualified personnel is recommended during all ground-disturbing activities. Each phase of construction and development through production will be monitored by the BLM, BIA, and representatives of the MHA Nation to ensure the protection of cultural, archaeological, and natural resources. In conjunction with 43 CFR 46.30, 46.145, 46.310, and 46.415, a report will be developed by the BLM and BIA that documents the results of monitoring in order to adapt the projects to eliminate any adverse impact on the environment.

### **3.10 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

Removal and consumption of oil and/or gas from the Bakken Formation would be an irreversible and irretrievable commitment of resources. Other potential resource commitments include land area devoted to the disposal of cutting, soil lost to erosion (i.e., wind and water), unintentionally destroyed or damage cultural resources, wildlife killed as a result of collision with vehicles (e.g., construction machinery and work trucks), and energy expended during construction and operation.

### **3.11 SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY**

Short-term development activities would not detract significantly from long-term productivity and use of the project areas. The construction of access roads and well pad areas would eliminate any forage or habitat use by wildlife and/or livestock. Any allottees to which compensation for land disturbance is owed will be properly compensated for the loss of land use. The initial disturbance area would decrease considerably once the wells were drilled and non-necessary areas had been reclaimed. Rapid reclamation of the project area would facilitate revived wildlife and livestock usage, stabilize soil, and reduce the potential for erosion and sedimentation.

### **3.12 CUMULATIVE IMPACTS**

Environmental impacts may accumulate either over time or in combination with similar events in the area. Unrelated and dissimilar activities may also have negative impacts on critical elements, thereby contributing to the cumulative degradation of the environment. Past and current disturbances near the project area include farming, grazing, roads, and other oil and gas wells. Reasonably foreseeable future impacts must also be considered. Should development of these wells prove productive, it is likely that Zenergy and possibly other operators would pursue additional development in the area. Current farming and ranching activities are expected to continue with little change because virtually all available acreage is

already organized into range units to use surface resources for economic benefit. Undivided interests in the land surface, range permits, and agricultural leases are often held by different tribal members than those holding mineral rights. Over the past several years, exploration has accelerated over the Bakken Formation. Most of this exploration has taken place outside the Reservation boundary on fee land, but for purposes of cumulative impact analyses, land ownership and the Reservation boundary are immaterial. Although it is the dominant activity currently taking place in the area, oil and gas development is not expected to have more than a minor cumulative effect on land use patterns.

Three confidential wells are found within 1 mile of project location (Table 18). There are 68, 314, and 1,769 oil and gas wells (active, confidential, and permitted) within 5, 10, and 20 miles, respectively of the proposed project areas (Tables 19 through 21; Figure 33).

**Table 18. Confidential, Active, and Permitted Wells within a 1-mile Radius of the Project Area.**

	Black Hawk #15-34H		Rubia #16-24H		Beaks #36-35H		Stevenson #15-8H		KYW #27-34H	
	on	off	on	off	on	off	on	off	on	off
Reservation (on/off)	on	off	on	off	on	off	on	off	on	off
Confidential Wells	2	-	0	-	1	-	0	-	0	-
Active Wells	0	-	0	-	0	-	0	-	0	-
Permitted Wells	0	-	0	-	0	-	0	-	0	-

**Table 19. Confidential, Active, and Permitted Wells within a 5-mile Radius of the Project Area.**

	Black Hawk #15-34H		Rubia #16-24H		Beaks #36-35H		Stevenson #15-8H		KYW #27-34H	
	on	off	on	off	on	off	on	off	on	off
Reservation (on/off)	on	off	on	off	on	off	on	off	on	off
Confidential Wells	3	-	7	-	5	-	5	2	5	2
Active Wells	6	-	6	-	10	-	4	3	2	5
Permitted Wells	0	-	1	-	0	-	1	0	1	0

**Table 20. Confidential, Active, and Permitted wells within a 10-mile Radius of the Project Area.**

	Black Hawk #15-34H		Rubia #16-24H		Beaks #36-35H		Stevenson #15-8H		KYW #27-34H	
	on	off	on	off	on	off	on	off	on	off
Reservation (on/off)	on	off	on	off	on	off	on	off	on	off
Confidential Wells	20	-	29	3	29	-	19	35	19	13
Active Wells	14	-	17	6	18	-	13	16	17	42
Permitted Wells	0	-	1	0	1	-	1	0	1	0

**Table 21. Confidential, Active, and Permitted Wells within a 20-mile Radius of the Project Area.**

	Black Hawk #15-34H		Rubia #16-24H		Beaks #36-35H		Stevenson #15-8H		KYW #27-34H	
	on	off	on	off	on	off	on	off	on	off
Reservation (on/off)	on	off	on	off	on	off	on	off	on	off
Confidential Wells	46	23	74	66	85	38	67	78	75	72
Active Wells	86	57	47	212	39	121	53	228	56	212
Permitted Wells	18	0	1	0	11	0	1	0	1	2



Figure 33. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the proposed project locations.

Within the Reservation and near the proposed project areas, development projects remain few and widely dispersed. None of the project areas proposed in this EA would share access roads with any other proposed wells, but this may change in the future. If successful commercial production is achieved, new exploratory wells may be proposed, though such developments are merely speculation until APDs are submitted to the BLM and BIA for approval. Zenergy has suggested but not yet formally proposed that potentially five to six more wells may eventually be drilled in the same general area as the proposed project, using many of the same main access roads and minimizing the disturbance as much as possible.

It is anticipated that the pace and level of natural gas development in this region of the state will continue at the current rate over the next few years and contribute to cumulative air quality impacts. The Proposed Action would incrementally contribute to emissions occurring in the region. In general, however, the increase in emissions associated with the Proposed Action—most of which would occur during well construction—would be localized, largely temporary, and limited in comparison with regional emissions.

No surface discharge of water would occur under the Proposed Action, nor would any surface water or groundwater be used during project development. The Proposed Action, when combined with other actions (cattle grazing, other oil and gas development, and agriculture) that are likely to occur in and near the project area in the future, would increase sedimentation and runoff rates. Sediment yield from active roadways could occur at higher rates than background rates and continue indefinitely. Thus, the Proposed Action could incrementally add to existing and future sources of water quality degradation in the Independence Point Bay, Waterchief Bay, and Bear Den Creek Watersheds, but increases in degradation would be reduced by Zenergy's commitment to minimizing disturbance, using erosion control measures as necessary, and implementing BMPs designed to reduce impacts.

Unlike well pads, active roadways are not typically reclaimed, thus sediment yield from roads can continue indefinitely at rates two to three times the background rate. The Proposed Action would create additional lengths of unpaved roadway in the project area. Thus, the Proposed Action would incrementally add to existing and future impacts to soil resources in the general area. However, Zenergy is committed to using BMPs to mitigate these effects. BMPs would include implementing erosion and sedimentation control measures such as installing culverts with energy-dissipating devices at culvert outlets to avoid sedimentation in ditches, constructing water bars alongside slopes, and planting cover crops to stabilize soil following construction and before permanent seeding takes place.

Vegetation resources across the project area could be affected by various activities, including additional energy development and surface disturbance of quality native prairie areas that have been largely undisturbed by development activities, grazing, and agriculture. Indirect impacts to native vegetation may be possible due to soil loss, compaction, and increased encroachment of unmanaged invasive weed species. Continued oil and gas development within the Reservation could result in the loss and further fragmentation of native mixed-grass prairie habitat. Past, present, and reasonably foreseeable future activities in the general area have reduced and would likely continue to reduce the amount of available habitat for listed species.

Significant archaeological resources are irreplaceable and often unique; any destruction or damage of such resources can be expected to diminish the archaeological record as a whole. However, no such damage or destruction of significant archaeological resources is anticipated as a result of the Proposed Action because these resources would be avoided, negating the cumulative impacts to the archaeological record.

The Proposed Action would incrementally add to existing and future socioeconomic impacts in the general area. The Proposed Action includes five wells, which would be an additional source of revenue for some residents of the Reservation. Increases in employment would be temporary during the construction, drilling, and completion phases of the proposed project. Therefore, little change in employment would be expected over the long term.

Current impacts from oil and gas-related activities are still fairly dispersed, and the required BMPs would limit potential impacts. No significant negative impacts are expected to affect any critical element of the human environment; impacts would generally be low and mostly temporary. Zenergy has committed to implementing interim reclamation of the roads and well pads immediately following construction and completion. Implementation of both interim and permanent reclamation measures would decrease the magnitude of cumulative impacts.

## **4.0 CONSULTATION AND COORDINATION**

The BIA must continue to make efforts to solicit the opinions and concerns of all stakeholders (Table 22). For the purpose of this EA, a stakeholder is considered any agency, municipality, or individual person that the proposed action may affect either directly or indirectly in the form of public health, environmental, or socioeconomic issues. A scoping letter declaring the location of the proposed project areas and explaining the actions proposed at each site was sent in advance of this EA to allow stakeholders ample time to submit comments or requests for additional information. Additionally, a copy of this EA should be submitted to all federal agencies with interests either in, near, or potentially affected by the proposed actions.

*Environmental Assessment: Zenergy Operating Company, LLC,  
Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

**Table 22. Scoping Comments.**

<b>Name</b>	<b>Organization</b>	<b>Comment</b>	<b>Response to Comment</b>
Bagley, Lonny	BLM	No Comment	
Benson, Barry	MHA Nation	No Comment	
Bercier, Marilyn	BIA	No Comment	
Berg, George	NoDak Electric Cooperative, Inc.	No Comment	
Black, Mike	BIA	No Comment	
Boyd, Bill	Midcontinent Cable Company	No Comment	
Brady, Perry	THPO, Three Affiliated Tribes	No Comment	
Brugh, V. Judy	MHA Nation	No Comment	
Cayko, Richard	McKenzie County	No Comment	
Chevance, Nick	National Parks Service	No Comment	
Christenson, Ray	Southwest Water Authority	No Comment	
Cimarosti, Dan	USACE	Enclosed Section 10 Application incase a permit is required.	No Section 10 Applications will be needed for this project.
Crooke, Patsy	USACE	Enclosed fact sheet to determine if permit is required.	Noted.
Danks, Marvin	Fort Berthold Rural Water Director	No Comment	
Dhieux, Joyce	EPA	No Comment	
Dixon, Doug	Montana Dakota Utilities	No Comment	
Erickson, Carroll	Ward County Board of Commissioners	No Comment	
Ferris, Kade	Turtle Mountain Band of Chippewa	No cultural or natural resources of the tribe's interest will be affected.	Noted.
Fitzpatrick, Barbara	FEMA	Concerned if project area is located in a Special Flood Hazard Area.	Noted.
Flores, J.R.	U.S. Department of Agriculture	No Comment	
Fox, Fred	MHA Nation	No Comment	

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<b>Name</b>	<b>Organization</b>	<b>Comment</b>	<b>Response to Comment</b>
Glatt, David	North Dakota Department of Health	Impacts will be minor and can be controlled by proper construction methods.	BMPs discussed in APD and will be covered in Conditions of Approval.
Glover, John	Natural Resources Conservation Service	Confirms receipt of letter requesting a determination of the project affecting farmland according to FPPA [Farmland Protection Policy Act]. Recommends impacts to wetlands be avoided.	FPPA does not apply to the project. See Wetlands section in EA.
Guzman, Frank	USFS	No Comment	
Hanson, Jesse	North Dakota Parks and Recreation	Project does not affect state park lands. Sensitive vegetative community is adjacent to project area.	Identified vegetative community will not be directly affected by the project.
Hauck, Reinhard	Dunn County	No Comment	
Hefferman, Dan	EPA	No Comment	
His Horse Is Thunder, Ron	Chairman, Standing Rock Sioux Tribe	No Comment	
Hoffman, Warren	Killdeer, Weydahl Field	No Comment	
Hovda, Roger	Reservation Telephone Cooperative	No Comment	
Hudson-Schenfisch, Julie	McLean County Board of Commissioners	No Comment	
Hynek, David	Chair, Mountrail Board of County Commissioners	No Comment	
Johnson, Harley	New Town Municipal Airport	No Comment	
Kadimas, Ray	Dunn County	No Comment	
Kuehn, John	Parshall-Hankins Field Airport	No Comment	
Kulas, Cheryl	Indian Affairs Commission	No Comment	
Kyner, Dave	FEMA	Concerned if project area is located in a Special Flood Hazard Area.	Noted.
Latimer, Tom	Red Willow Great Plains, LLC	No Comment	
Laux, Eric	USACE	No Comment	

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Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

<b>Name</b>	<b>Organization</b>	<b>Comment</b>	<b>Response to Comment</b>
Lindemann, Larry	Airport Manager, Barnes County Municipal Airport	No Comment	
McKenna, Mike	North Dakota Game and Fish Department	Recommend construction be avoided where possible in native prairie, wooded draws, riparian areas, and wetlands. Botanical and raptor surveys suggested.	See Wildlife, Wetlands, and Vegetation sections in the EA. BMPs discussed in APD and will be covered in Conditions of Approval.
McPhillips, Kelly	Bureau of Reclamation	Near some of the proposed locations, rural water lines have either been constructed or are proposed to be constructed.	Noted and informed Zenergy.
Melhouse, Ronald	Bureau of Reclamation	No rural water lines will be located in the general area of the Dakota-3 Rubia #16-34H location.	Noted.
Nash, Mike	BLM	No Comment	
Nelson, Richard	U.S. Bureau of Reclamation	No Comment	
Nordquist, Don	Petro-Hunt, LLC	No Comment	
Obenauer, Steve	FAA	No objection,	Noted
Olson, Frances	McKenzie County	No Comment	
Paaverud, Merl	State Historical Society	Request a copy of site forms and reports.	See Cultural Resources section.
Packineau, Mervin	MHA Nation	No Comment	
Paulson, Gerald	Western Area Power Administration	No Comment	
Pearson, Myra	Spirit Lake Sioux Tribe	No Comment	
Peterson, Walter	North Dakota Department of Transportation	No Comment	
Poitra, Fred	MHA Nation	No Comment	
Prchal, Doug	North Dakota Parks and Recreation Department	No Comment	
Renschler, Jason	USACE	Enclosed Section 10 Application increase a permit is required.	No Section 10 Applications will be needed for this project.

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Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

Name	Organization	Comment	Response to Comment
Rudolph, Reginald	McLean Electric Cooperative, Inc.	No Comment	
Russell, Irwin	Natural Resources Conservation Service	Confirms receipt of letter requesting a determination of the project affecting farmland according to FPPA [Farmland Protection Policy Act]. Recommends impacts to wetlands be avoided.	FPPA does not apply to the project. See Wetlands section in EA.
Schelkoph, David	West Plains Electric Cooperative, Inc.	No Comment	
Selvage, Michael	Chairman, Sisseton-Wahpeton Sioux Tribe	No Comment	
Shortbull, Marietta	Fort Berthold Agency	No Comment	
Smith, Heather	EOG Resources, Inc.	No Comment	
Sorensen, Charles	USACE	No Comment	
Svoboda, Larry	EPA	No Comment	
Thompson, Brad	USACE	Any placement of dredge or fill materials into waters of the US requires a Department of the Army authorization under Section 404 of the Clean Water act.	Noted.
Thorson, Gary	McKenzie Electric Cooperative	No Comment	
Towner, Jeffrey	USFWS	Enclosed fact sheet explaining threatened and endangered species, migratory birds, high value habitat to avoid, habitat fragmentation, and reclamation.	Noted.
Wells, Marcus	Chairman, MHA Nation	No Comment	
Whitcalf, Frank	MHA Nation	No Comment	
Williams, Damon	MHA Nation	No Comment	
Wolf, Malcolm	MHA Nation	No Comment	

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Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

<b>Name</b>	<b>Organization</b>	<b>Comment</b>	<b>Response to Comment</b>
Chief Missile Engineer	Minot Air Force Base	No Comment	
Garrison Project Office	USACE	No Comment	
Insurance & Hazard Director	FEMA	No Comment	
Land Department	Northern Border Pipeline Company	No Comment	
Manager	Xcel Energy	No Comment	
NAGRPA Office	Three Affiliated Tribes	No Comment	
Natural Resources Department	Three Affiliated Tribes	No Comment	

*Environmental Assessment: Zenergy Operating Company, LLC,  
Dakota-3 Black Hawk #15-34H, Dakota-3 Rubia #16-24H, Dakota-3 Beaks #36-35H,  
Dakota-3 Stevenson #15-8H, and Dakota-3 KYW #27-34H*

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United States Department of the Interior

BUREAU OF INDIAN AFFAIRS  
Great Plains Regional Office  
115 Fourth Avenue S.E.  
Aberdeen, South Dakota 57401



IN REPLY REFER TO:  
DESCRM  
MC-208

JAN 26 2010

Perry 'No Tears' Brady, THPO  
Mandan, Hidatsa and Arikara Nation  
404 Frontage Road  
New Town, North Dakota 58763

Dear Mr. Brady:

We have considered the potential effects on cultural resources of five oil well pads and access roads in Dunn and McKenzie Counties, North Dakota. Approximately 107.71 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the areas depicted in the enclosed reports. One archaeological site (32DU1478) was located that may possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (42 USC 1996).

As the surface management agency, and as provided for in 36 CFR 800.5, we have therefore reached a determination of **no historic properties affected** for this undertaking. Catalogued as BIA Case Number AAO-1740/FB/10, the proposed undertakings, locations, and project dimensions are described in the following reports:

Lechert, Stephanie

- (2010) A Class I and Class III Cultural Resource Inventory of the Beaks 36-35H Well Pad and Access Road on the Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for Zenergy Operating Company, LLC, Tulsa, OK.
- (2010) A Class I and Class III Cultural Resource Inventory of the KYW 27-34H Well Pad and Access Road on the Fort Berthold Indian Reservation, McKenzie County, North Dakota. SWCA Environmental Consultants for Zenergy Operating Company, LLC, Tulsa, OK.
- (2010) A Class I and Class III Cultural Resource Inventory of the Stevenson 16-8H Well Pad and Access Road on the Fort Berthold Indian Reservation, McKenzie County, North Dakota. SWCA Environmental Consultants for Zenergy Operating Company, LLC, Tulsa, OK.
- (2010) A Class I and Class III Cultural Resource Inventory of the Zenergy Rubia 16-24H Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn and McKenzie Counties, North Dakota. SWCA Environmental Consultants for Zenergy Operating Company, LLC, Tulsa, OK.

Page 2

Rose, Victoria, and Stephanie Lechert  
(2010) A Class I and Class III Cultural Resource Inventory of the Black Hawk 15-34H Well Pad  
and Access Road on the Fort Berthold Indian Reservation, Dunn County, North Dakota.  
SWCA Environmental Consultants for Zenergy Operating Company, LLC, Tulsa, OK.

If your office concurs with this determination, consultation will be completed under the National  
Historic Preservation Act and its implementing regulations. The Standard Conditions of  
Compliance will be adhered to.

If you have any questions, please contact Dr. Carson N. Murdy, Regional Archaeologist,  
at (605) 226-7656.

Sincerely,



Regional Director

Enclosures

cc: Chairman, Three Affiliated Tribes  
Superintendent, Fort Berthold Agency

## **List of Preparers**

An interdisciplinary team contributed to this document, following guidance in Part 1502.6 of CEQ regulations. This document was drafted by SWCA under the direction of the BIA. Information was compiled from various sources within SWCA.

### **Zenergy**

- Kelley Bryan, Williston Basin Land Manager

### **SWCA**

- Sarah Ruffo, Wildlife Biologist  
*Prepared the Environmental Assessment.*
- Michael Cook, Ecologist  
*Conducted natural resource surveys for well pads and access roads.*
- Christopher McLaughlin, Biologist  
*Conducted natural resource surveys for well pads and access roads.*
- Jon Markman, Archaeologist/Field Coordinator  
*Conducted cultural resource surveys for well pads and access roads.*
- Alan Hutchinson, Archaeologist  
*Conducted cultural resource surveys for well pads and access roads.*
- Amarina Wuenschel, GIS Specialist  
*Created maps and spatially derived data.*
- Brent Sobotka, Hydrologist/CPESC  
*Completed water resources and soil erosion sections.*
- Richard Wadleigh, NEPA Coordinator  
*Reviewed document for content and adequacy.*
- Stephanie Lechert, Archaeologist  
*Completed cultural resources section and reports.*

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## **6.0 ACRONYMS**

<b>°F</b>	degrees Fahrenheit
<b>APD</b>	application for permit to drill
<b>APE</b>	area of potential effect
<b>BIA</b>	Bureau of Indian Affairs
<b>BLM</b>	Bureau of Land Management
<b>BMP</b>	best management practice
<b>CAA</b>	Clean Air Act
<b>CFR</b>	Code of Federal Regulations
<b>EA</b>	environmental assessment
<b>EIS</b>	environmental impact statement
<b>EJ</b>	environmental justice
<b>EPA</b>	Environmental Protection Agency
<b>ESA</b>	Endangered Species Act
<b>FONSI</b>	finding of no significant impact
<b>GHG</b>	greenhouse gas
<b>HAP</b>	hazardous air pollutant
<b>HUC</b>	hydrologic unit code
<b>MHA Nation</b>	Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara Nation
<b>NAGPRA</b>	Native American Graves Protection and Repatriation Act
<b>NDCC</b>	North Dakota Century Code
<b>NDDH</b>	North Dakota Department of Health
<b>NDIC</b>	North Dakota Industrial Commission
<b>NEPA</b>	National Environmental Policy Act
<b>NRCS</b>	Natural Resources Conservation Service
<b>NRHP</b>	National Register of Historic Places
<b>NTL</b>	notice to lessees
<b>PEM</b>	palustrine emergent
<b>ROW</b>	right-of-way
<b>SHPO</b>	State Historic Preservation Officer
<b>TCP</b>	traditional cultural property
<b>THPO</b>	Tribal Historic Preservation Officer
<b>TMD</b>	total measured depth
<b>TVD</b>	total vertical depth
<b>USC</b>	United States Code
<b>USFS</b>	U.S. Forest Service
<b>USFWS</b>	U.S. Fish and Wildlife Service
<b>USGS</b>	U.S. Geological Survey
<b>VOC</b>	volatile organic compound



# United States Department of the Interior

## BUREAU OF RECLAMATION

Dakotas Area Office

P.O. Box 1017

Bismarck, North Dakota 58502



DK-5000  
ENV-6.00

NOV 19 2009

Ms. Sarah Ruffo  
Environmental Specialist  
SWCA Environmental Consultants  
115 North 4<sup>th</sup> Street Suite 1  
Bismarck, ND 58501

Subject: Solicitation for Environmental Assessment for Drilling and Completion of Six Proposed Oil and Gas Exploratory Wells on the Fort Berthold Reservation, McKenzie County, North Dakota

Dear Ms. Ruffo:

This letter is written to inform you that your letter was received on November 18 and the information and maps have been reviewed by Bureau of Reclamation staff.

Proposed oil well sites located in McKenzie County could potentially affect Reclamation facilities in the form of the rural water pipelines of the Fort Berthold Rural Water System. All proposed well sites or their access roads are located in the vicinity of a water pipeline either existing or proposed for construction.

### McKenzie County

Dakota-3 Black Hawk #15-34H: SE $\frac{1}{4}$ SE $\frac{1}{4}$  Section 34, T149, R92W, Dunn County, ND  
Dakota-3 Plenty Sweet Grass #18-7H: SE $\frac{1}{4}$ SW $\frac{1}{4}$  Section 18, T149, R94W, McKenzie Co., ND  
Dakota-3 KYH #27-34H: SW $\frac{1}{4}$  NW $\frac{1}{4}$  Section 27, T150, R94W, McKenzie Co., ND  
Dakota-3 Helena Ruth Grant #33-34H: NW $\frac{1}{4}$ SW $\frac{1}{4}$  Section 334, T150, R93W, Dunn Co., ND  
Dakota-3 Wells #32-29H: SE $\frac{1}{4}$ SE $\frac{1}{4}$  Section 32, T150, R93W, Dunn County, ND  
Dakota-3 Kate Soldier #23-14H: NW $\frac{1}{4}$ SE $\frac{1}{4}$  Section 23, T150, R94W, Dunn County, ND

We are providing maps depicting the proposed water line alignments in the vicinity of the well site locations that could potentially affect Reclamation facilities. Since Reclamation is the lead Federal agency for the Fort Berthold Rural Water System, we request that any work planned on the reservation be coordinated with Mr. Marvin Danks, Fort Berthold Rural Water Director, Three Affiliated Tribes, 308 4 Bears Complex, New Town, North Dakota 58763.

Thank you for providing the information and opportunity to comment. If you have any further questions, please contact me at 701-221-1287 or Ron Melhouse at 701-221-1288.

Sincerely,



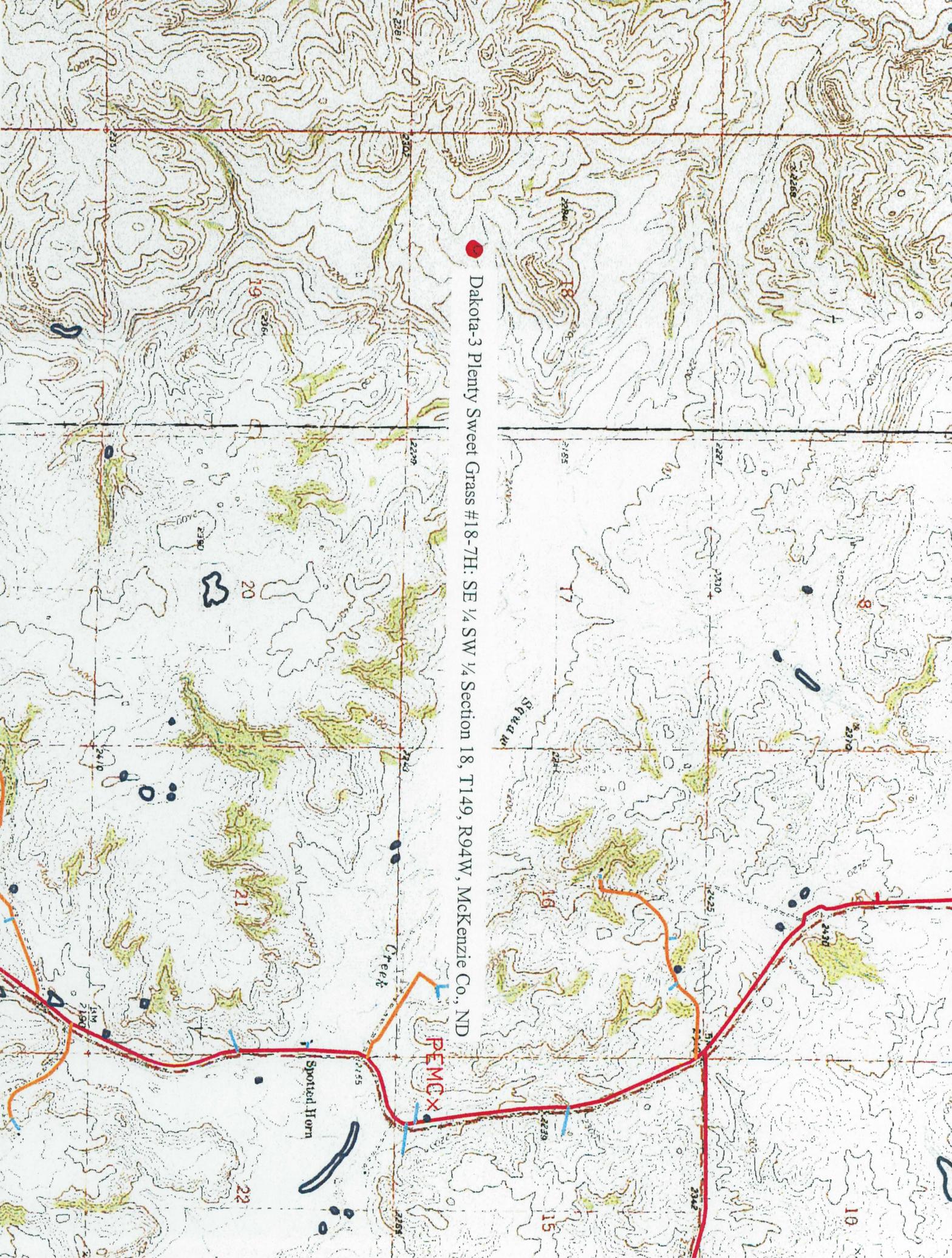
Kelly B. McPhillips  
Environmental Specialist

Enclosure

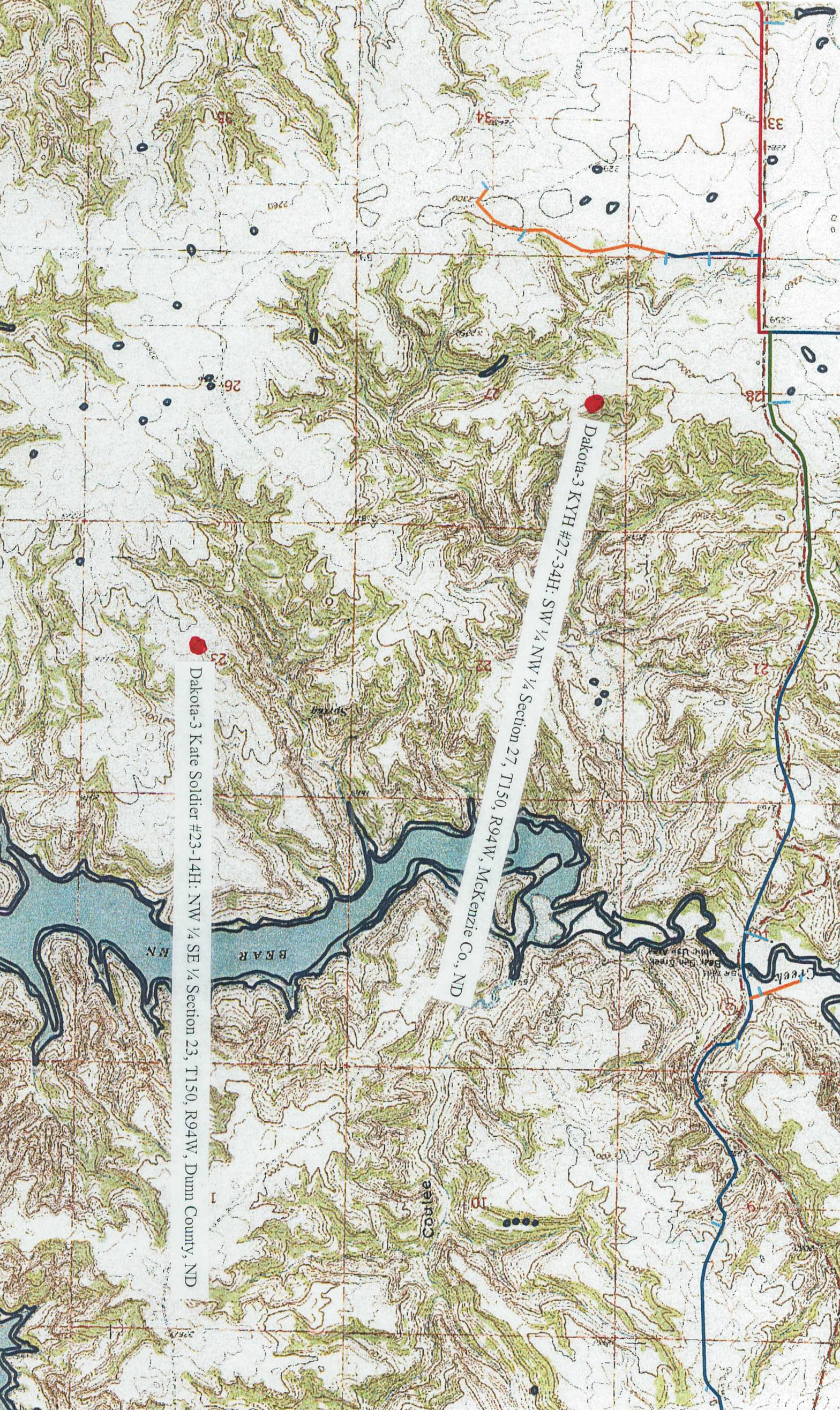
cc: Bureau of Indian Affairs  
Great Plains Regional Office  
Attention: Ms. Marilyn Bercier  
115 Fourth Avenue S.E.  
Aberdeen, SD 57401

Mr. Marvin Danks  
Fort Berthold Rural Water Director  
Three Affiliated Tribes  
308 4 Bears Complex  
New Town, ND 58763  
(w/encl)



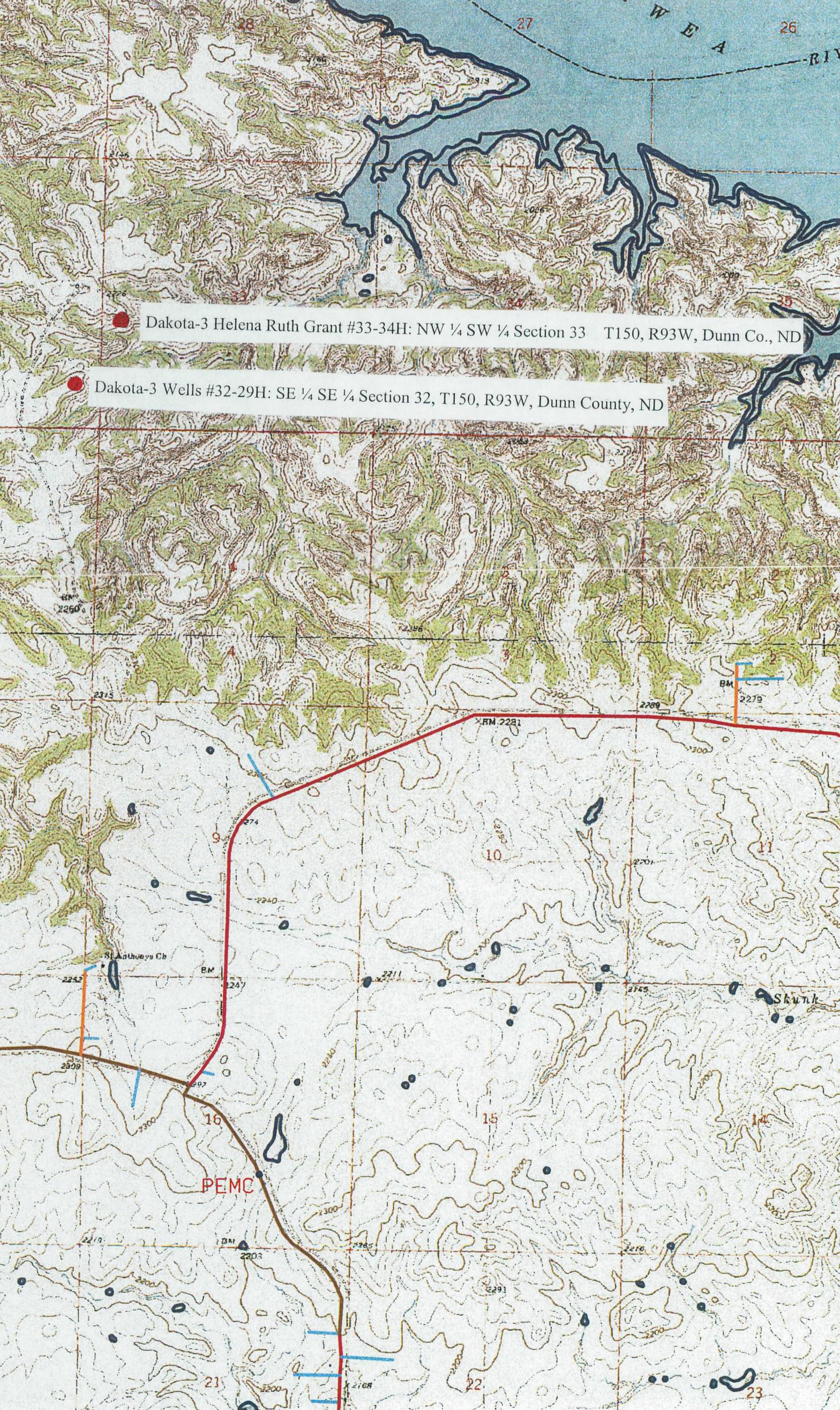


● Dakota-3 Plenty Sweet Grass #18-7H: SE ¼ SW ¼ Section 18, T149, R94W, McKenzie Co., ND



Dakota-3 KYH #27-34H. SW 1/4 NW 1/4 Section 27, T150, R94W, McKenzie Co., ND

Dakota-3 Kate Soldier #23-14H. NW 1/4 SE 1/4 Section 23, T150, R94W, Dunn County, ND



Dakota-3 Helena Ruth Grant #33-34H: NW ¼ SW ¼ Section 33 T150, R93W, Dunn Co., ND

Dakota-3 Wells #32-29H: SE ¼ SE ¼ Section 32, T150, R93W, Dunn County, ND

PEMC

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W E A R I V



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
3425 Miriam Avenue  
Bismarck, North Dakota 58501



DEC 17 2009

Ms. Sarah Ruffo, Environmental Specialist  
SWCA Environmental Consultants  
115 North 4<sup>th</sup> Street, Suite 1  
Bismarck, North Dakota 58501

Re: Six exploratory oil and gas wells on  
the Fort Berthold Reservation

Dear Ms. Ruffo:

This is in response to your November 17, 2009, letter regarding proposed exploratory oil and gas wells on the Fort Berthold Reservation. Zenergy Operating Company, LLC has proposed six exploratory oil and gas wells on the Fort Berthold Reservation, McKenzie and Dunn Counties, North Dakota.

Specific locations in Dunn County are:

Dakota-3 Black Hawk # 15-34H: T. 149 N., R. 92 W., Section 34, SE $\frac{1}{4}$ SE $\frac{1}{4}$   
Dakota-3 Helena Ruth Grant #33-34H: T. 150 N., R. 93 W., Section 33, NW $\frac{1}{4}$ SW $\frac{1}{4}$   
Dakota-3 Wells #32-29H: T. 150 N., R.93 W., Section 32, SE $\frac{1}{4}$ SE $\frac{1}{4}$

Specific locations in McKenzie County are:

Dakota-3 Plenty Sweet Grass # 18-7H: T. 149 N., R. 94 W., Section 18, SE $\frac{1}{4}$ SW $\frac{1}{4}$   
Dakota-3 KYW # 27-34H: T. 150 N., R. 94 W., Section 27, SW $\frac{1}{4}$ NW $\frac{1}{4}$   
Dakota-3 Kate Soldier #23-14H: T. 150 N., R. 94 W., Section 23, NW $\frac{1}{4}$ SE $\frac{1}{4}$

We offer the following comments under the authority of and in accordance with the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.) (MBTA), the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.) (NEPA), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250) (BGEPA), Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds", the Endangered Species Act (16 U.S.C. 1531 et seq.) (ESA), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

In an e-mail dated October 13, 2009, the Bureau of Indian Affairs (BIA) designated SWCA to represent the BIA for informal Section 7 consultation under the ESA. Therefore, the U.S. Fish and Wildlife Service (Service) is responding to you as the designated non-Federal representative.

## Threatened and Endangered Species

A list of federally endangered and threatened species that may be present within the proposed project's area of influence is enclosed. This list fulfills requirements of the Service under Section 7 of the ESA. This list remains valid for 90 days. The BIA or designated non-Federal agent should make a determination of the proposed projects' effects on listed species, including whether there is anticipated destruction or adverse modification of designated critical habitat. This determination may be included in the EA. It should state whether or not the BIA plans to incorporate the Service's recommendations to avoid and minimize any adverse effects. If the BIA does not plan to take the recommended measures, the document should explain why not.

There is designated critical habitat for the piping plover in McKenzie and Dunn Counties. We recommend that a buffer of at least one-half mile be maintained from piping plover critical habitat. Critical habitat can be viewed on the Service website ([http://www.fws.gov/northdakotafieldoffice/endspecies/species/piping\\_plover.htm](http://www.fws.gov/northdakotafieldoffice/endspecies/species/piping_plover.htm)). GIS layers of critical habitat can be obtained by contacting our office at the letterhead address.

The Aransas Wood Buffalo Population (AWBP) of endangered whooping cranes is the only self-sustaining migratory population of whooping cranes remaining in the wild. These birds breed in the wetlands of Wood Buffalo National Park in Alberta and the Northwest Territories of northern Canada, and overwinter on the Texas coast. Whooping cranes in the AWBP annually migrate through North Dakota during their spring and fall migrations. They make numerous stops along their migration route to feed and roost before moving on.

Whooping cranes in the AWBP annually migrate through North Dakota during their spring and fall migrations. The proposed project lies within a 90 mile corridor that includes approximately 75 percent of all reported whooping crane sightings in the State (enclosure 1).

Whooping cranes are unlikely to spend more than a few days in any one spot during migration. The Service suggests that the Environmental Assessment (EA) include a requirement that if a whooping crane is sighted within one mile of a well site or associated facilities while it is under construction, that all work cease within one-mile of that part of the project and the Service be contacted immediately. In coordination with the Service, work may resume after the bird(s) leave the area.

Potential habitat for the Dakota skipper exists on the Fort Berthold Reservation in Dunn and McKenzie Counties. In 1995, the Dakota skipper was determined to be a candidate species under the ESA. No legal requirement exists to protect candidate species; however, it is within the spirit of the ESA to consider these species as having significant value and worth protecting.

The Dakota skipper is a small to medium-sized hesperiine butterfly associated with high quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed grass prairie. The first type of habitat is relatively flat and moist native bluestem prairie. Three species of wildflowers are usually present: wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Zygadenus elegans*). The second habitat type is upland (dry) prairie that is often on ridges and hillsides. Bluestem grasses and needlegrasses dominate these habitats. On this habitat type, three wildflowers are typically present in high quality sites that are suitable for Dakota skipper: pale purple (*Echinacea pallida*) and upright (*E. angustifolia*) coneflowers and blanketflower (*Gaillardia sp.*). Because of the difficulty of surveying for Dakota skippers and a short survey window, we recommend that the project avoid any impacts to potential Dakota skipper habitat. If Dakota skipper habitat is present near the proposed project, and you intend to take precautions to avoid impacts to skipper habitat, please notify the Service for further direction.

### **Migratory Birds**

The MBTA has no provisions for incidental take. Regardless, it is understood that some birds may be killed even if all reasonable conservation measures are implemented. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, and through fostering relationships with individuals and industries seeking to eliminate their impacts to migratory birds. While it is not possible under the MBTA and BGEPA to absolve individuals or companies from liability by following these guidelines, enforcement will be focused on those individuals or companies that take migratory birds with disregard for the law, and where no legitimate conservation measures have been applied. Please inform us as to whether you intend to follow the following recommendations to minimize impacts to migratory birds, including bald and golden eagles.

Schedule construction for late summer or fall/early winter so as not to disrupt migratory birds or other wildlife during the breeding season (February 1 to July 15). If work is proposed to take place during the breeding season or at any other time which may result in the take of migratory birds, their eggs, or active nests, the Service recommends that the project proponent arrange to have a qualified biologist conduct a field survey of the affected habitats to determine the presence of nesting migratory birds. If nesting migratory birds, their eggs, or active nests are found, we request you contact this office, suspend construction, or take other measures, such as maintaining adequate buffers, to protect the birds until the young have fledged. The Service further recommends that field surveys for nesting birds, along with information regarding the qualifications of the biologist(s) performing the surveys, and any avoidance measures implemented at the project site be thoroughly documented and that such documentation be shared with the Service and maintained on file by the project proponent.

The Service estimates that 500,000 to 1 million birds are killed nationwide every year from exposed oil at oil drilling and/or production sites. The unauthorized take of migratory birds at oil production facilities can be prevented with a minimum of expense

and effort. Wildlife mortalities in North Dakota are most often observed in association with drilling reserve pits, flare pits, and/or drip buckets and barrels. The Service strongly recommends that the pads be constructed as closed-loop systems, without a reserve pit. Regardless of whether the pads are built with reserve pits, we recommend that the BIA include the following measures in the EA so as to ensure compliance with the MBTA.

- **Keep Oil Off Open Pits or Ponds.** Immediate clean up of oil in open pits is critical to prevent wildlife mortalities.
- **Place Covers on Drip Buckets/Barrels Located Under Valves and Spigots.** Bird entrapments are common within the small (55 gallon or less) barrels placed under valves and spigots to collect dripped oil. Placing a wire mesh or grate over the top of these barrels is a very practical way of preventing access for wildlife.
- **Use Effective and Proven Exclusionary Devices.** Netting is the most effective method of keeping birds from entering open pits (reserve and flare pits). Flagging, reflectors, and strobe lights are not effective. Published scientific studies as well as field inspections by Service personnel have documented bird mortalities at oil pits with flagging, reflectors, and strobe lights (e.g. Esmoil 1995). The effectiveness of netting pits to exclude birds and other wildlife depends on its installation. Effective installation requires a design allowing for snow-loading and one that also prevents ground entry by small mammals and birds. A maximum mesh size of 1.5 inches will allow for snow-loading and will exclude most birds. Nets or wire mesh over flare pits can be implemented if the flare tube is high enough to keep flame away from the net. Some examples of both effective and ineffective netting techniques can be found on the Service's website at <http://www.fws.gov/mountain%2Dprairie/contaminants/contaminants1c.html>.

Bald and/or golden eagles may use the project area where the proposed wells will be located. Golden eagles inhabit a wide variety of habitat types, including open grassland areas. They are known to nest on cliffs, in trees, manmade structures, and on the ground (Kochert et al. 2002). There are numerous records of golden eagle nests on the Fort Berthold reservation (Pers. Comm. Anne Marguerite Coyle, Dickinson State University). While the bald eagle tends to be more closely associated with forested areas near water (Buehler 2000), they have been found nesting in single trees several miles from the nearest water body. Therefore, there may also be potential habitat for the bald eagle at the proposed project sites. Especially early in the nesting season, eagles can be very sensitive to disturbance near the nest site and may abandon their nest as a result of low disturbance levels, even from foot traffic. A buffer of at least 1/2 mile should be maintained for golden and bald eagle nests. A permit is required for any take of bald or golden eagles or their nests. Permits to take golden eagles or their nests are available only for legitimate emergencies and as part of a program to protect golden eagles.

The Service recommends that aerial raptor surveys be conducted prior to any on-the-ground activities. The Service recommends that an aerial nest survey (preferably by

helicopter) be conducted within 1.0-mile of any proposed ground disturbances to identify active and inactive nest sites near the proposed well pad and associated facilities, including proposed new roads. Aerial surveys should be conducted between March 1 and May 15, before leaf-out so that nests are visible.

Aerial surveys should include the following:

1. Due to the ability to hover and facilitate observations of the ground, helicopters are preferred over fixed wing aircraft, although small aircraft may also be used for the raptor surveys. Whenever possible, two observers should be used to conduct the surveys. Even experienced observers only find approximately 50 percent of nests on a flight (Pers. Comm. Anne Marguerite Coyle, Dickinson State University), so we recommend that two flights be performed prior to any on-the-ground work, including other biological surveys or other work.
2. Observations of raptors and nest sites should be recorded using GPS. The date, location, nest condition, activity status, raptor species, and habitat should be recorded for each sighting.
3. We request that you share the qualifications of the biologist(s) conducting the survey, method of survey, and results of the survey with the Service.

### **High Value Habitat Avoidance**

To minimize disturbance to fish and wildlife habitat in the project area, the Service provides the following recommendations:

- Make no stream channel alterations or changes in drainage patterns.
- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels.
- Reseed disturbed areas with a mixture of native grass and forb species immediately after construction to reduce erosion.

### **Cumulative Effects Analysis**

A large number of wells and appurtenant facilities are being constructed in the western portion of North Dakota. The Service is concerned that the wells, and especially the associated roads, are being put in piecemeal without an overarching plan to ensure that the facilities are being constructed to access all new pads most efficiently, while disturbing the least amount of habitat. While we understand that there is still some level of uncertainty regarding the extent of the oil formations, there has been enough drilling in this area that the Service believes that the uncertainty is relatively small and decreasing. It would be appropriate for the EA to include some cumulative effects analysis of the

existing and proposed pads, roads, electrical transmission lines, and preferably pipelines to transport the products.

### **Habitat Fragmentation**

Prairie habitat is increasingly being lost or fragmented because of the large number of wells and associated roads that are being constructed in areas of the State that were formerly relatively undeveloped. Only about 30% of native prairie in North Dakota remains from pre-settlement times (Strong et al. 2005), with nearly all native tallgrass prairie converted nationwide (Ricketts et al. 1999). Oil pads, associated roadways, and vehicle traffic can cause fragmentation of the landscape, disrupting wildlife patterns, and making it more likely that non-native plant species may invade an area. The Service recommends placing as few well pads as possible on the landscape and locating pads so as to avoid or minimize the construction of new roads. Many prairie species require large, contiguous blocks of grasslands for their biological needs and may either avoid patchy habitat or experience reduced reproductive success.

- The Service recommends that impacts to native prairie be avoided or minimized. If native prairie cannot be avoided, the Service recommends outlining stringent reclamation requirements, including a bond sufficient to cover the cost of reclamation, as described in the “Post-production Phase – Reclamation” section below.
- The Service recommends that oil wells use existing roads and trails to the greatest extent possible, minimizing all new road construction.
- If a new road is necessary, the Service recommends avoiding native prairie to the greatest extent possible.
- If new roads are constructed, the Service recommends that the disturbed areas along the road be reseeded immediately with a native prairie mix to reduce erosion and prevent invasion by non-native species. Disturbed areas should be monitored regularly throughout the life of the project, and treated with herbicide as necessary to ensure that exotic species are not infesting disturbed areas.
- If multiple companies are developing well pads in the same general area, roads should be shared to the greatest extent possible to minimize disturbance.
- Install and maintain appropriate erosion control measures to reduce sedimentation and water quality degradation of wetlands and streams near the project area.

The Service recommends that the BIA incorporate the relevant requirements described in the Dakota Prairie Grasslands Land and Resource Management Plan (USDA 2001). This document includes a number of requirements to avoid sensitive resources. In particular, the Service suggests that the BIA incorporate the relevant portions of Appendix D, Oil and Gas Stipulations.

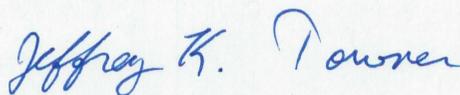
## Post-production Phase – Reclamation

Each project should include a plan to restore the landscape following project completion, including a bond sufficient to reclaim the area in full. Within one year of a well's closure, the well pads, roads, and associated facilities should be completely removed from the landscape, the land recontoured back to its original profile, and the area reseeded with a native prairie mix. Since native prairie species take some time to establish, and intensive management may be required for several years to ensure that weeds do not infest the area, the Service recommends that the BIA follow the timeline requirements set out in the 2003 *North Dakota Public Service Commission, Standards for evaluation of revegetation success and recommended procedures for pre-and postmining vegetation assessments* (available on-line at <http://www.psc.state.nd.us/jurisdiction/reclamation/files/revvegdocjuly2003final.pdf>). This document requires that reclaimed areas be managed for a minimum of ten years, starting in the year when first seeded. Starting in the sixth year, for at least two consecutive years, or three out of the last five, including the last year, the reclaimed area must meet the approved standard as described in the document.

For prairie areas, the Service recommends planting a diverse mixture of native cool and warm season grasses and forbs. While the North Dakota Public Service Commission document requires only five native grass species, recent research has suggested that a more diverse mix, including numerous forb species, is not only ecologically beneficial, but is also more weed resistant, allowing for less intensive management and chemical use. In essence, the more species included in a mixture, the higher the probability of providing competition to resist invasion by non-native plants. The seed source should be as local as possible, preferably collected from the nearby native prairie.

Thank you for the opportunity to comment on this project. If you require further information or the project plans change, please contact me or Carol Aron of my staff at (701) 250-4481 or at the letterhead address.

Sincerely,



Jeffrey K. Towner  
Field Supervisor  
North Dakota Field Office

Enclosures

cc: Bureau of Indian Affairs, Aberdeen  
(Attn: Marilyn Bercier)  
Bureau of Land Management, Dickinson  
ND Game & Fish Department, Bismarck

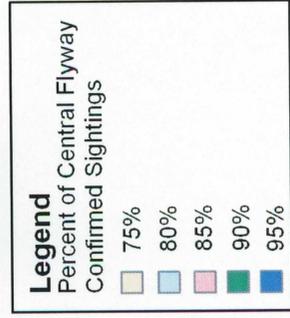
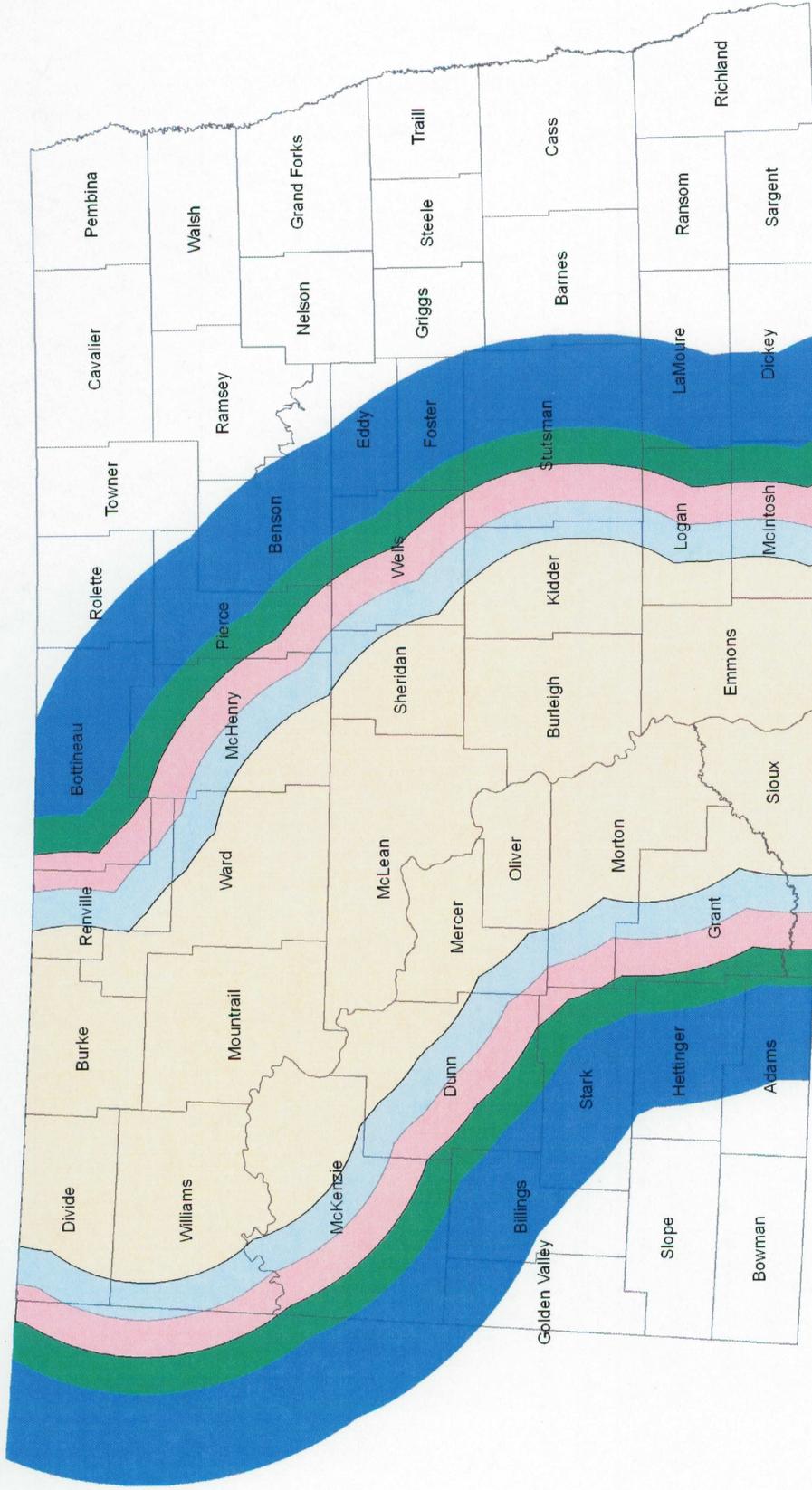
## Literature Cited

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- Esmoil, B. 1995. Wildlife mortality associated with oil pits in Wyoming. *Prairie Naturalist* 27(2): 81-88.
- Kochert, M. N., K. Steenhof, C. L. McIntyre and E. H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed October 13, 2009. Available online at: <http://bna.birds.cornell.edu/bna/species/684>.
- Ricketts, T. H., E. Dinerstein, D. M. Olsen, C. J. Loucks, W. Eichbaum, D. DellaSala, K. Kavanagh, P. Hedao, P. T. Hurley, K. M. Carney, R. Abell, and S. Walters. 1999. *Terrestrial ecoregions of North America: a conservation assessment*. Island Press, Washington, D.C. 485 pages.
- Strong, L. L., T. H. Sklebar, and K. E. Kermes. 2005. *The North Dakota Gap Analysis Project – Final Report*. U.S. Geological Survey. 451 pages. Available online at [http://www.npwrc.usgs.gov/projects/ndgap/NDGAP\\_FinalReport\\_complete.pdf](http://www.npwrc.usgs.gov/projects/ndgap/NDGAP_FinalReport_complete.pdf).
- USDA. 2001. *Land and resource management plan for the Dakota Prairie Grasslands Northern Region*. Accessed October 13, 2009. Available at [http://www.fs.fed.us/ngp/plan/feis\\_plan\\_dakota\\_prairie.htm](http://www.fs.fed.us/ngp/plan/feis_plan_dakota_prairie.htm).



U.S. Fish and Wildlife Service

North Dakota and Montana Whooping Crane Migration Corridor  
*Central Flyway of the United States*



Produced for Ecological Services  
 Grand Island, NE  
 Current to: 2007

FEDERAL THREATENED, ENDANGERED, AND CANDIDATE SPECIES  
AND DESIGNATED CRITICAL HABITAT FOUND IN  
DUNN COUNTY, NORTH DAKOTA  
December 2009

**ENDANGERED SPECIES**

Birds

Interior least tern (*Sterna antillarum*): Nests along midstream sandbars of the Missouri and Yellowstone Rivers.

Whooping crane (*Grus Americana*): Migrates through west and central counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Young adult summered in North Dakota in 1989, 1990, and 1993. Total population 140-150 birds.

Fish

Pallid sturgeon (*Scaphirhynchus albus*): Known only from the Missouri and Yellowstone Rivers. No reproduction has been documented in 15 years.

Mammals

Black-footed ferret (*Mustela nigripes*): Exclusively associated with prairie dog towns. No records of occurrence in recent years, although there is potential for reintroduction in the future.

Gray wolf (*Canis lupus*): Occasional visitor in North Dakota. Most frequently observed in the Turtle Mountains area.

**THREATENED SPECIES**

Birds

Piping plover (*Charadrius melodus*): Nests on midstream sandbars of the Missouri and Yellowstone Rivers and along shorelines of saline wetlands. More nest in North Dakota than any other state.

## **CANDIDATE SPECIES**

### Invertebrates

Dakota skipper (Hesperia dacotae): Found in native prairie containing a high diversity of wildflowers and grasses. Habitat includes two prairie types: 1) low (wet) prairie dominated by bluestem grasses, wood lily, harebell, and smooth camas; 2) upland (dry) prairie on ridges and hillsides dominated by bluestem grasses, needlegrass, pale purple and upright coneflowers and blanketflower.

## **DESIGNATED CRITICAL HABITAT**

### Birds

Piping Plover - Lake Sakakawea - Critical habitat includes sparsely vegetated shoreline beaches, peninsulas, islands composed of sand, gravel, or shale, and their interface with the water bodies.

FEDERAL THREATENED, ENDANGERED, AND CANDIDATE SPECIES  
AND DESIGNATED CRITICAL HABITAT FOUND IN  
MCKENZIE COUNTY, NORTH DAKOTA  
December 2009

**ENDANGERED SPECIES**

Birds

Interior least tern (*Sterna antillarum*): Nests along midstream sandbars of the Missouri and Yellowstone Rivers.

Whooping crane (*Grus Americana*): Migrates through west and central counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Young adult summered in North Dakota in 1989, 1990, and 1993. Total population 140-150 birds.

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Birds

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## **CANDIDATE SPECIES**

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## **DESIGNATED CRITICAL HABITAT**

### Birds

Piping Plover - Lake Sakakawea - Critical habitat includes sparsely vegetated shoreline beaches, peninsulas, islands composed of sand, gravel, or shale, and their interface with the water bodies.



Natural Resources Conservation Service  
P.O. Box 1458  
Bismarck, ND 58502-1458

---

December 3, 2009

Sarah Ruffo  
SWCA Environmental Consultants  
115 North 4<sup>th</sup> Street, Suite 1  
Bismarck, ND 58501

RE: Construction, drilling, completion and production of six exploratory oil and gas wells on the Fort Berthold Reservation by Zenergy Operating Company, LLC (Zenergy). The surface locations for the wells are proposed in the following locations:

- Dakota-3 Black Hawk #15-34H.
- Dakota-3 Plenty Sweet Grass #18-7H.
- Dakota-3 KYW #27-34H.
- Dakota-3 Helena Ruth Grant #33-34H.
- Dakota-3 Wells #32-29H.
- Dakota-3 Kate Soldier #23-14H.

Dunn and McKenzie Counties, ND

Dear Ms. Ruffo:

The Natural Resources Conservation Service (NRCS) has reviewed your letter dated November 17, 2009, regarding the approval of construction, drilling, completion and production of six exploratory oil and gas wells on the Fort Berthold Reservation by Zenergy.

*Important Farmlands* - NRCS has a major responsibility with FPPA in documenting conversion of farmland (i.e., prime, statewide, and local importance) to non-agricultural use. It appears your proposed project is not supported by federal funding or actions; therefore, FPPA does not apply and no further action is needed.

*Wetlands* – The Wetland Conservation Provisions of the 1985 Food Security Act, as amended, provide that if a USDA participant converts a wetland for the purpose of, or to have the effect of, making agricultural production possible, loss of USDA benefits could occur. NRCS has developed the following guidelines for the installation of permanent structures where wetlands occur. If these guidelines are followed, the impacts to the wetland(s) will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements: 1) Disturbance to the wetland(s) must be temporary, 2) no drainage of the wetland(s) is allowed (temporary or permanent), 3) mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained,

*Helping People Help the Land*

An Equal Opportunity Provider and Employer



Ms. Ruffo  
Page 2

4) temporary side cast material must be placed in such a manner not to be dispersed in the wetland, and 5) all trenches must be backfilled to the original wetland bottom elevation.

NRCS would recommend that impacts to wetlands be avoided. If the project requires passage through or disturbance of a wetland, NRCS can complete a certified wetland determination, if requested by the landowner/operator.

If you have additional questions pertaining to FPPA, please contact Steve Sieler, State Soil Liaison, at (701) 530-2019.

Sincerely,



**ACTING** JOHN GLOVER  
Acting State Conservationist

cc:

Susan Tuhy, DC, NRCS, Killdeer, ND

Kyle Hartel, DC, NRCS, Watford City, ND

Terrance Gisvold, ASTC (FO), NRCS, Dickinson, ND



November 24, 2009

Sarah Ruffo, Environmental Specialist  
SWCA Environmental Consultants  
115 North 4<sup>th</sup> Street, Suite 1  
Bismarck, ND 58501

Re: Zenergy Operating Co., LLC  
Six Exploratory Oil & Gas Wells on the  
Fort Berthold Reservation, Dunn and McKenzie Counties

Dear Ms. Ruffo:

This department has reviewed the information concerning the above-referenced project submitted under date of November 17, 2009, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. Development of the production facilities and any access roads or well pads should have a minimal effect on air quality provided measures are taken to minimize fugitive dust. However, operation of the wells has the potential to release air contaminants capable of causing or contributing to air pollution. We encourage the development and operation of the wells in a manner that is consistent with good air pollution control practices for minimizing emissions.
2. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.
3. Oil and gas related construction activities located within tribal boundaries within North Dakota may be required to obtain a permit to discharge storm water runoff from the U.S. Environmental Protection Agency. Further information may be obtained from the U.S. EPA's website or by calling the U.S. EPA – Region 8 at (303) 312-6312. Also, cities or counties may impose additional requirements and/or specific best management practices for

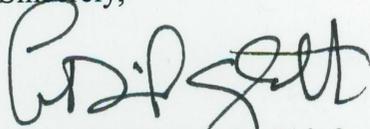
construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

A handwritten signature in black ink, appearing to read "L. David Glatt". The signature is written in a cursive, somewhat stylized font.

L. David Glatt, P.E., Chief  
Environmental Health Section

LDG:cc  
Attach.



## Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

### **Soils**

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

### **Surface Waters**

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

### **Fill Material**

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.



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## NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

December 15, 2009

Sarah Ruffo  
Environmental Specialist  
SWCA Environmental Consultants  
115 North 4<sup>th</sup> Street, Suite 1  
Bismarck, ND 58501

Dear Ms. Ruffo:

RE: Exploratory Oil & Gas Wells  
Forth Berthold Reservation

Zenergy Operating Company, LLC has proposed six exploratory oil and gas wells on the Fort Berthold Reservation in section 34, T149N, R92W, and sections 32 & 33, T150N, R93W, of Dunn County; and section 18, T149N, R94W, and sections 23 & 27, T150N, R94W, of McKenzie County, North Dakota.

Our primary concern with oil and gas development is the fragmentation and loss of wildlife habitat associated with construction of the well pads and access roads. We recommend that construction be avoided to the extent possible within native prairie, wooded draws, riparian corridors, and wetland areas.

We also suggest that botanical surveys be completed during the appropriate season and aerial surveys be conducted for raptor nests before construction begins.

Sincerely,

A handwritten signature in blue ink that reads "Steve Dyke". The signature is fluid and cursive.

(for) Michael G. McKenna  
Chief  
Conservation & Communication Division

js



John Hoeven, Governor  
Douglass A. Prchal, Director

1600 East Century Avenue, Suite 3  
Bismarck, ND 58503-0649  
Phone 701-328-5357  
Fax 701-328-5363  
E-mail [parkrec@nd.gov](mailto:parkrec@nd.gov)  
[www.parkrec.nd.gov](http://www.parkrec.nd.gov)

December 3, 2009

Sarah Ruffo  
SWCA  
115 North 4<sup>th</sup> Street, Ste 1  
Bismarck, ND 58501

Re: Drilling of Six Exploratory Oil and Gas Wells Project

Dear Ms. Ruffo:

The North Dakota Parks and Recreation Department (NDPRD) has reviewed the above referenced project proposal to drill oil and gas wells located in Section 34, T149N, R92W; Section 18, T149N, R94W; Sections 23 and 27, T150N, R94W; and Sections 32 and 33, T150N, R93W, McKenzie and Dunn Counties.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare species and ecological communities). The project as defined does not affect state park lands that we manage or Land and Water Conservation Fund recreation projects that we coordinate.

The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any current or historic plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, we do have records for the occurrence of *Cycleptus elongatus* (blue sucker) and *Scaphirhynchus albus* (pallid sturgeon) in sections adjacent to the project area indicating that the habitat in the project area may be suited for these species or other rare, threatened, sensitive or endangered species. Please see the attached spreadsheet and map for more information on these occurrences. We defer further comments regarding animal species to the North Dakota Game and Fish Department and the United States Fish and Wildlife Service.

Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

Thank you for the opportunity to comment on this project. Please contact Kathy Duttonhefner (701-328-5370 or [kgduttonhefner@nd.gov](mailto:kgduttonhefner@nd.gov)) of our staff if additional information is needed.

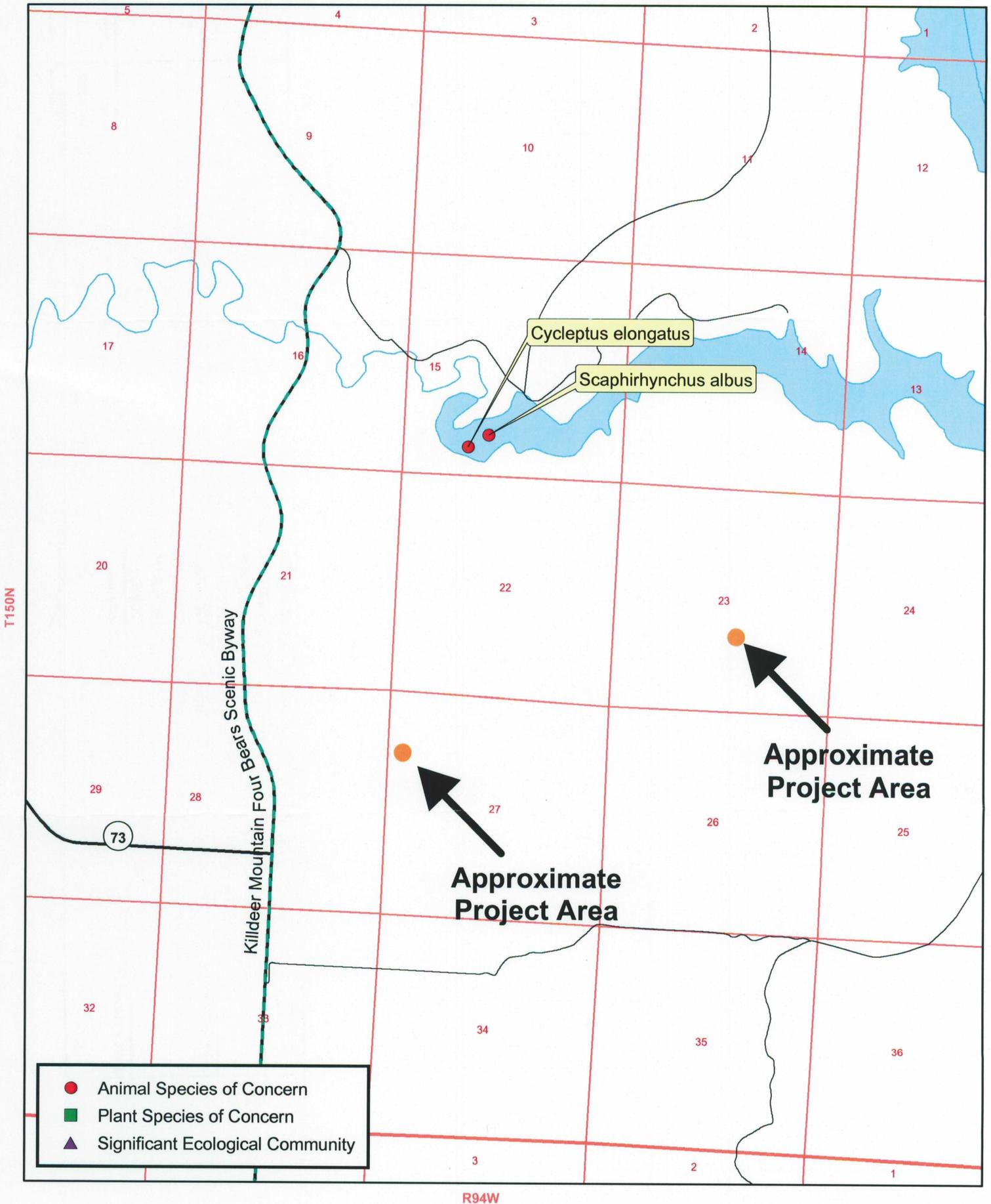
Sincerely,

Jesse Hanson, Coordinator  
Planning and Natural Resources Division

R.USNDNHI\*2009-262

.....  
*Play in our backyard!*

# North Dakota Natural Heritage Inventory Species of Concern and Significant Ecological Communities



North Dakota Natural Heritage Inventory  
 Rare Animal and Plant Species and Significant Ecological Communities

State Scientific Name	State Common Name	State Rank	Global Rank	Federal Status	Township Range Section	County	Last Observation	Estimated Representation Accuracy	Precision
Scaphirhynchus albus	Pallid Sturgeon	S1	G2	LE	150N094W - 15; 150N094W - 22; 150N094W - 23; 150N094W - 09; 150N094W - 16; 150N094W - 21; 150N094W - 10; 150N094W - 27; 150N094W - 14; 150N094W - 28; 150N094W - 11	McKenzie	1974-07-10		M
Cyplectus elongatus	Blue Sucker	S3	G3G4		150N094W - 15; 150N094W - 22; 150N094W - 23; 150N094W - 09; 150N094W - 16; 150N094W - 21; 150N094W - 10; 150N094W - 27; 150N094W - 14; 150N094W - 28; 150N094W - 11	McKenzie	1965-08-16		M

community (versus buffer area added for locational uncertainty). Use of estimated representation accuracy provides a common index for the consistent comparison of FD reps, thus helping to ensure that aggregated data are correctly analyzed and interpreted.

Very high (>95%)

High (70-95%)

Medium (40-70%)

Low (10-40%)

Unknown

(null) - Not assessed

Precision

A single-ether disk for the precision used to map the Element Occurrence (EO) on a U.S. Geological Survey (USGS) 7.5' (or 1:25,000) topographic quadrangle map, based on the previous Heritage methodology in which FDs were located on other map-making disks.

S - Second - accuracy of locality mapable within a 100-meter radius, 500 meters from the center point.

M - Minute - accuracy of locality mapable within a 10-minute radius, 2 km from the center point.

G - General - accuracy of locality mapable to major place name precision only, 5 km from center point.

U - Unmapable



**STATE  
HISTORICAL  
SOCIETY  
OF NORTH DAKOTA**

John Hoeven  
*Governor of North Dakota*

North Dakota  
State Historical Board

Chester E. Nelson, Jr.  
*Bismarck - President*

Gereld Gerntholz  
*Valley City - Vice President*

Richard Kloubec  
*Fargo - Secretary*

Albert I. Berger  
*Grand Forks*

Calvin Grinnell  
*New Town*

Diane K. Larson  
*Bismarck*

A. Ruric Todd III  
*Jamestown*

Sara Otte Coleman  
*Director  
Tourism Division*

Kelly Schmidt  
*State Treasurer*

Alvin A. Jaeger  
*Secretary of State*

Douglass Prchal  
*Director  
Parks and Recreation  
Department*

Francis Ziegler  
*Director  
Department of Transportation*

Merlan E. Paaverud, Jr.  
*Director*

*Accredited by the  
American Association  
of Museums*

November 23, 2009

Ms Sarah Ruffo  
Project Manager  
SWCA Environmental Consultants  
295 Interlocken Boulevard Suite 300  
Broomfield, CO 80021

**NDSHPO REF. 10-0254 BIA/MHAN Environmental Assessment for 6 proposed well pads & access roads Zenergy Operating Company, LLC Dakota 3 projects in Dunn and McKenzie Counties, North Dakota**  
**Black Hawk 15-34H [SE SE T149N R92W Section 34] Dunn**  
**Plenty Sweet Grass 18-7H [SE SW T149N R94W Section 18] McKenzie**  
**KYW 27-34H M [SW NW T150N R94W Section 27] McKenzie**  
**Helena Ruth Grant 33-34H [NW SW T150N R93W Section 33] Dunn**  
**Wells 32-29H [SE SE T150N R93W Section 32] Dunn**  
**Kate Soldier 23-14H [NW SE T150N R94W Section 23]**

Dear Ms. Ruffo,

We received your letter regarding NDSHPO REF. 10-0254 BIA/MHAN Environmental Assessment for 6 proposed well pads & access roads Zenergy Operating Company, LLC Dakota 3# projects in Dunn and McKenzie Counties, North Dakota. We request that a copy of cultural resource site forms and reports be sent to this office so that the cultural resources archives can be kept current. Perhaps one might consider putting TCP (Traditional Cultural Properties) related information in separate reports not sent to this office.

Thank you for your consideration. Consultation is with MHAN THPO. If you have any questions please contact Susan Quinnell, Review & Compliance Coordinator at (701)328-3576 or [squinnell@nd.gov](mailto:squinnell@nd.gov)

Sincerely,

Merlan E. Paaverud, Jr.  
State Historic Preservation Officer (North Dakota)  
and Director, State Historical Society of North Dakota



DK-5000  
ENV-6.00

# United States Department of the Interior

## BUREAU OF RECLAMATION

Dakotas Area Office  
P.O. Box 1017  
Bismarck, North Dakota 58502



DEC 8 2009

Ms. Sarah Ruffo  
Environmental Specialist  
SWCA Environmental Consultants  
115 North 4<sup>th</sup> Street Suite 1  
Bismarck, ND 58501

Subject: Solicitation for Environmental Assessment for Drilling and Completion of Six Proposed Oil and Gas Exploratory Wells on the Fort Berthold Reservation in McKenzie County, North Dakota

Dear Ms. Ruffo:

This letter is written to inform you that your letter was received on November 30 and the information and maps have been reviewed by Bureau of Reclamation staff.

Proposed oil well sites located in McKenzie and Dunn Counties could potentially affect Reclamation facilities in the form of the rural water pipelines of the Fort Berthold Rural Water System. All of the proposed well sites or their access roads are located in the vicinity of a water pipeline either existing or proposed for construction.

### Dunn County

Dakota-3 Beaks #36-35H: SE  $\frac{1}{4}$  NE  $\frac{1}{4}$  Section 36, T149, R93W, Dunn County, ND  
Dakota-3 Fox #14-18H: SE  $\frac{1}{4}$  SW  $\frac{1}{4}$  Section 08, T149, R93W, Dunn County, ND  
Dakota-3 Rubia #16-24H: SE  $\frac{1}{4}$  SE  $\frac{1}{4}$  Section 24, T149, R93W, Dunn County, ND

### McKenzie County

Dakota-3 Brugh #31-30H: SE  $\frac{1}{4}$  SE  $\frac{1}{4}$  Section 31, T149, R94W, McKenzie County, ND  
Dakota-3 Stevenson #16-08H: SE  $\frac{1}{4}$  SE  $\frac{1}{4}$  Section 08, T149, R94W, McKenzie County, ND

We are providing maps depicting the proposed water line alignments in the vicinity of the well site locations that could potentially affect Reclamation facilities. Since Reclamation is the lead Federal agency for the Fort Berthold Rural Water System, we request that any work planned on the reservation be coordinated with Mr. Marvin Danks, Fort Berthold Rural Water Director, Three Affiliated Tribes, 308 4 Bears Complex, New Town, North Dakota 58763.

Thank you for providing the information and opportunity to comment. If you have any further questions, please contact me at 701-221-1287 or Ron Melhouse at 701-221-1288.

Sincerely,

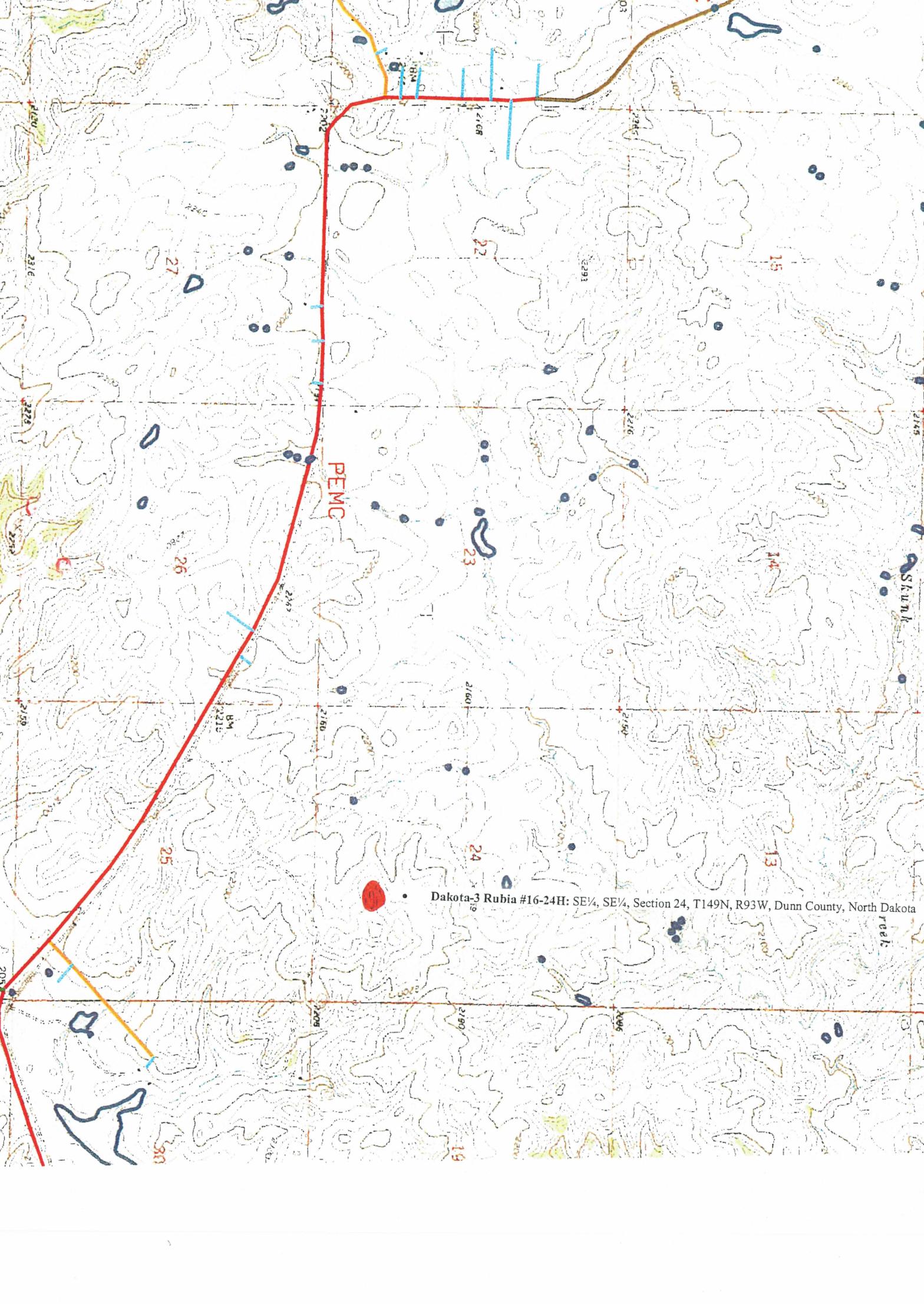


Kelly B. McPhillips  
Environmental Specialist

Enclosure

cc: Bureau of Indian Affairs  
Great Plains Regional Office  
Attention: Ms. Marilyn Bercier  
Regional Environmental Scientist  
115 Fourth Avenue S.E.  
Aberdeen, SD 57401

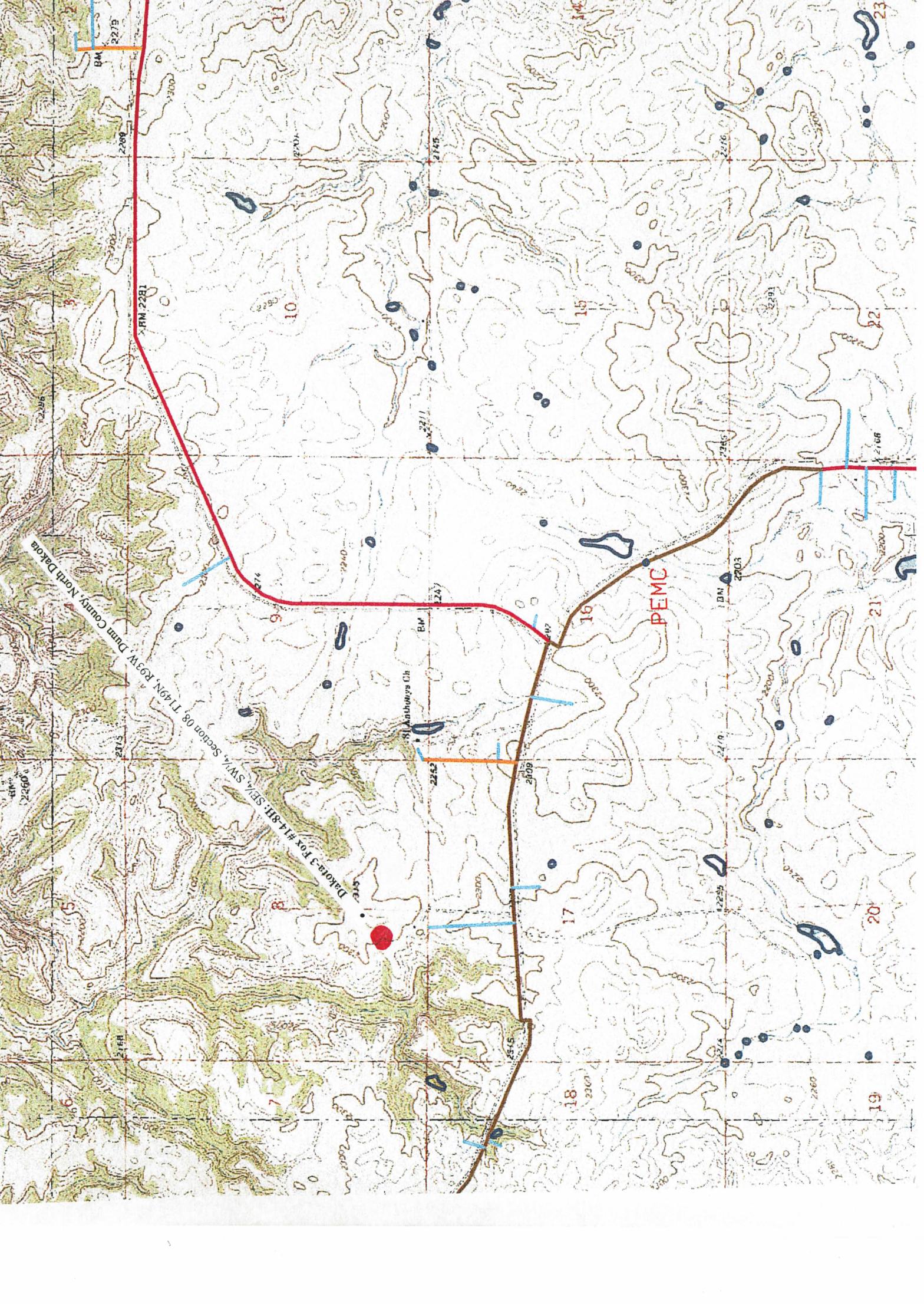
Mr. Marvin Danks  
Fort Berthold Rural Water Director  
Three Affiliated Tribes  
308 4 Bears Complex  
New Town, ND 58763  
(w/encl)

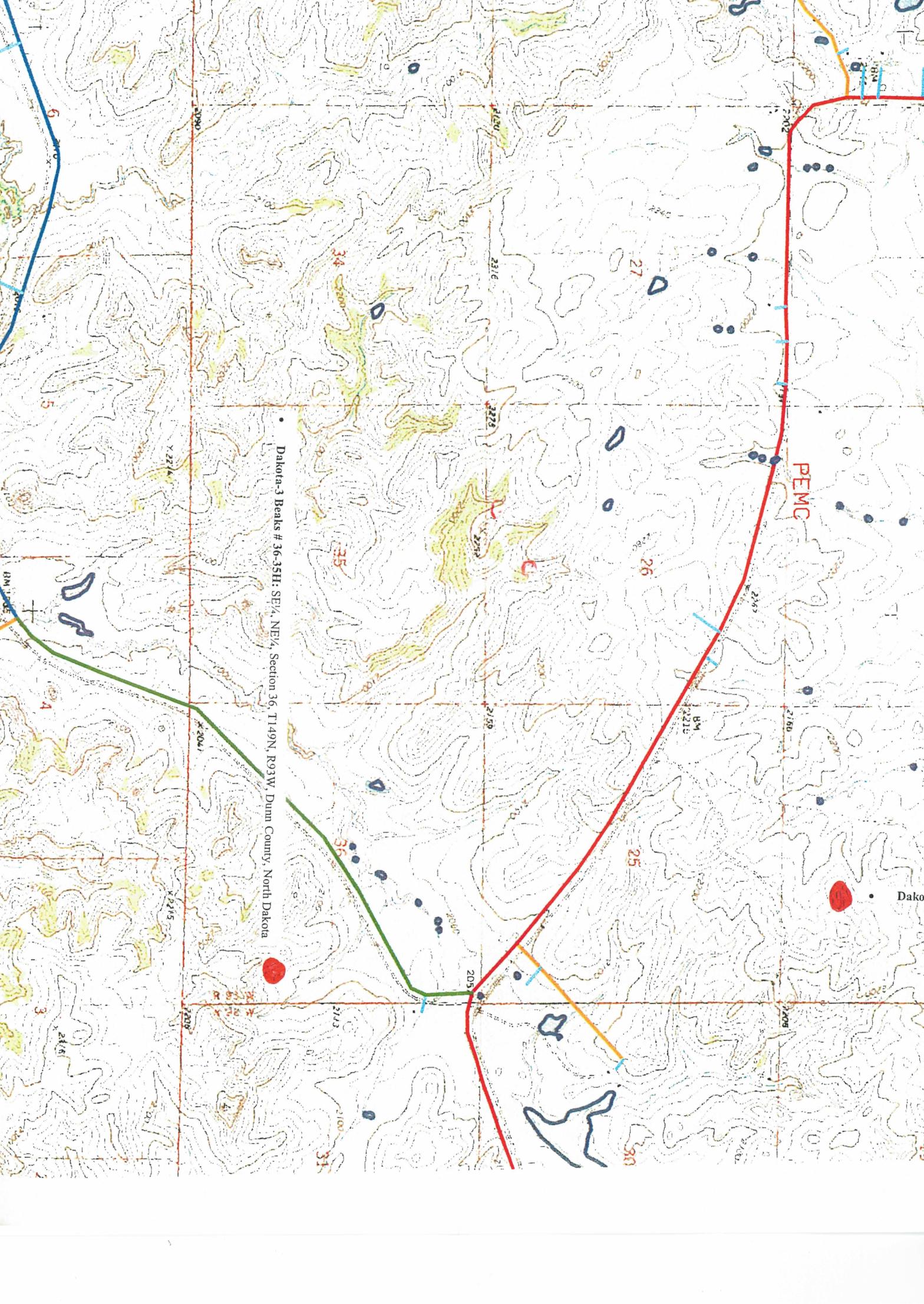


Dakota-3 Rubia #16-24H: SE1/4, SE1/4, Section 24, T149N, R93W, Dunn County, North Dakota

PEMC

Skunk creek

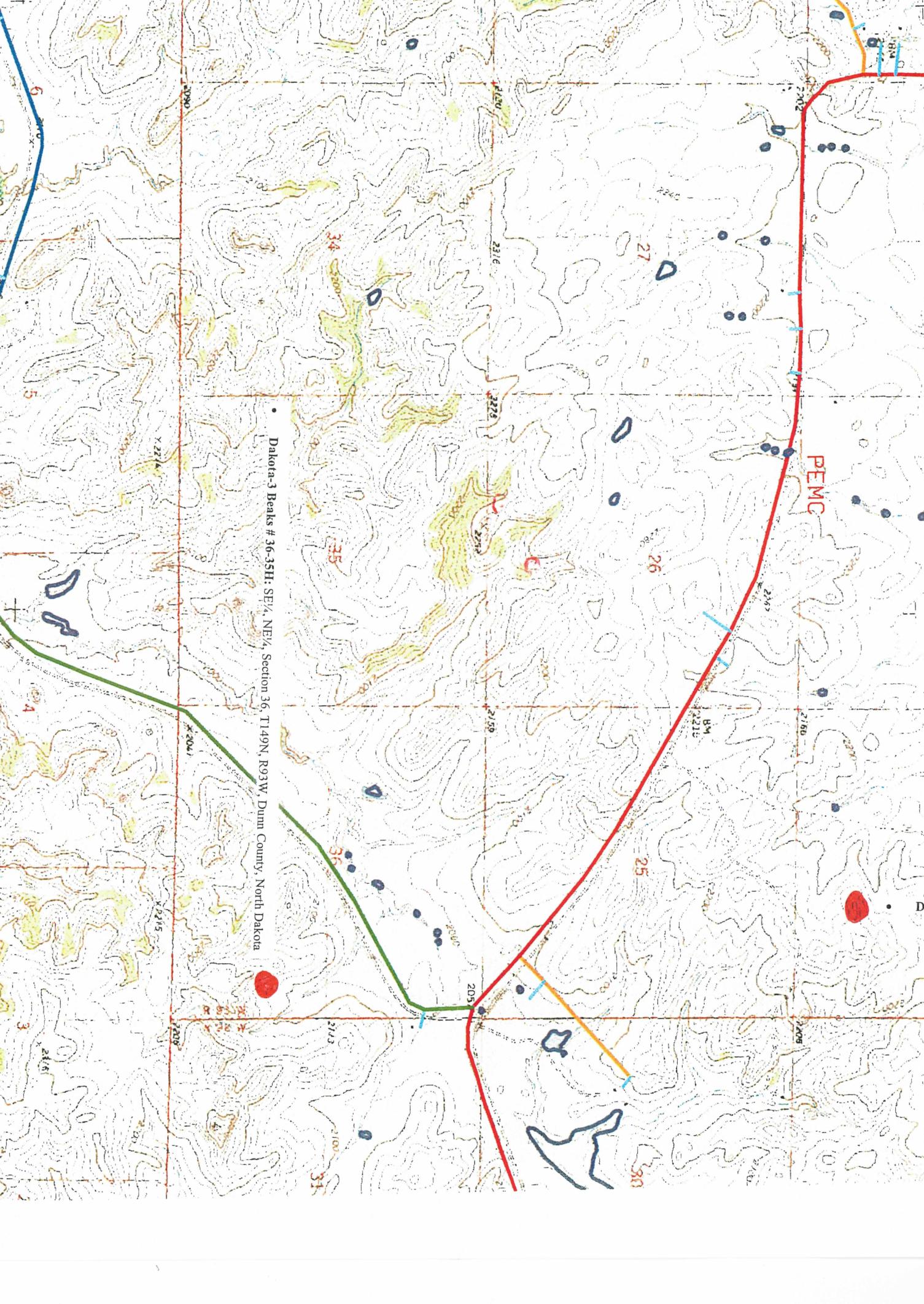


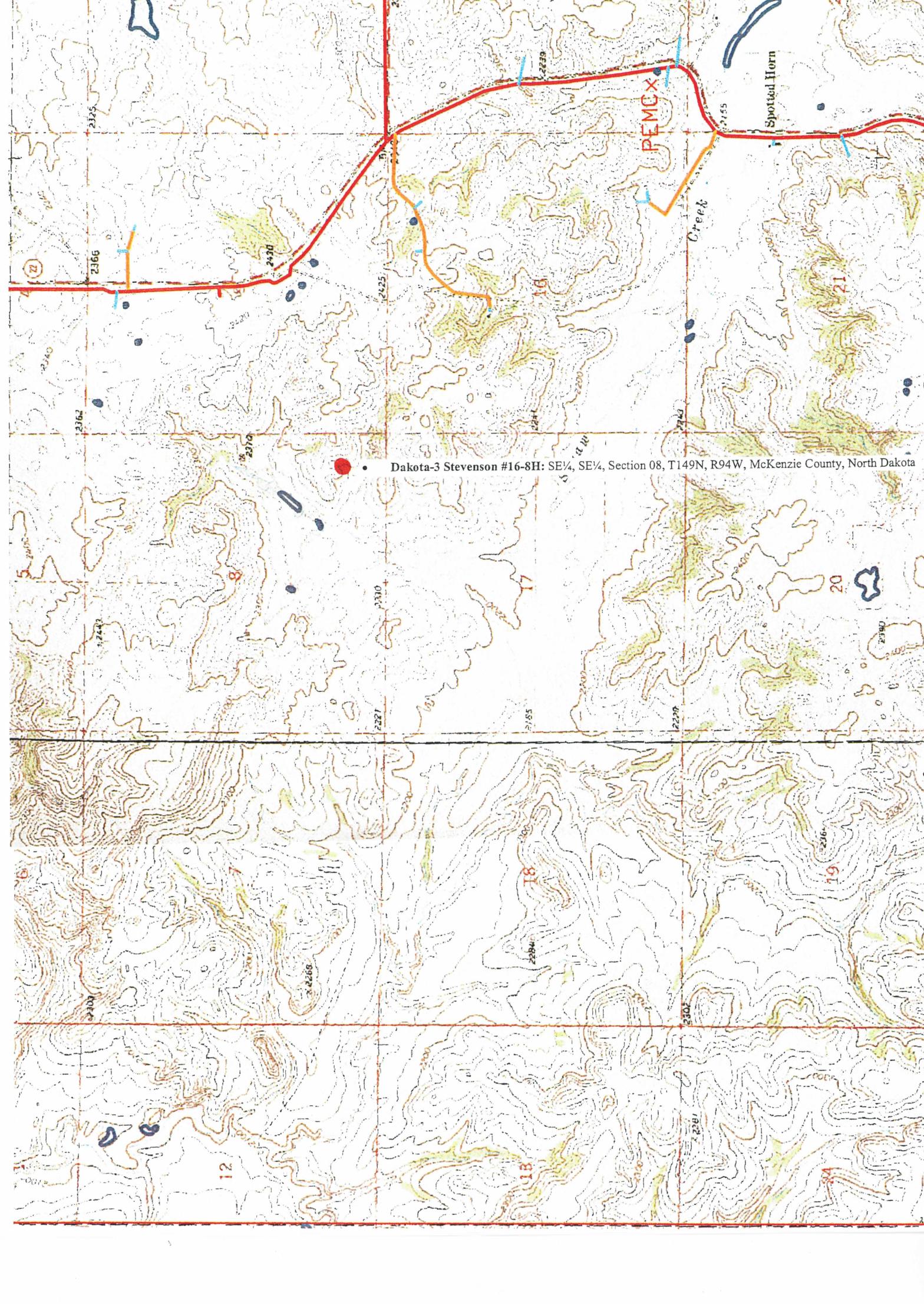


Dakota-3 Beaks # 36-35H, SE 1/4, NE 1/4, Section 36, T149N, R03W, Dunn County, North Dakota

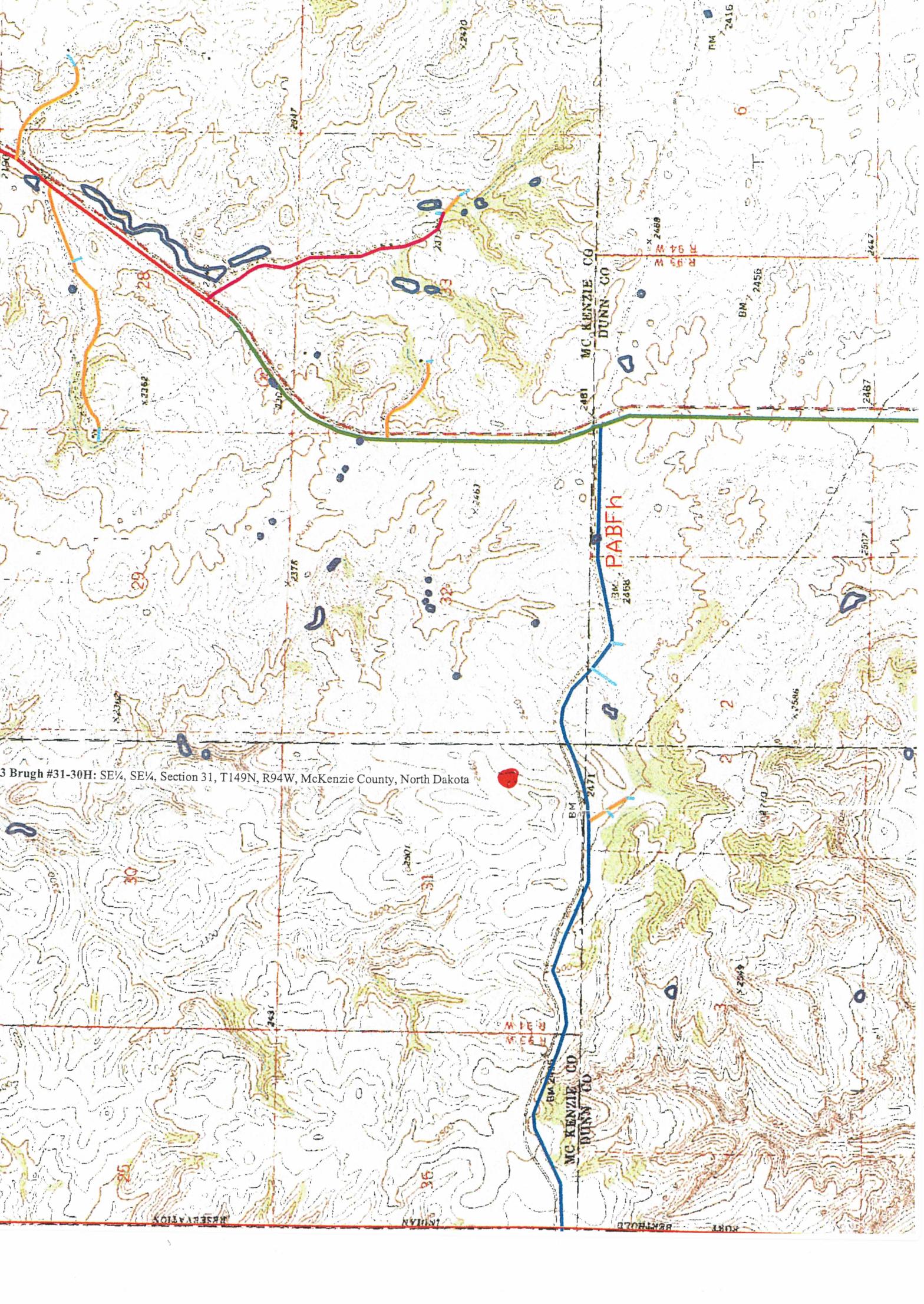
PEMIC

Dako





• Dakota-3 Stevenson #16-8H: SE¼, SE¼, Section 08, T149N, R94W, McKenzie County, North Dakota



3 Brugh #31-30H: SE¼, SE¼, Section 31, T149N, R94W, McKenzie County, North Dakota

PABFH

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# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
3425 Miriam Avenue  
Bismarck, North Dakota 58501



DEC 17 2009

Ms. Sarah Ruffo, Environmental Specialist  
SWCA Environmental Consultants  
115 North 4<sup>th</sup> Street, Suite 1  
Bismarck, North Dakota 58501

Re: Five exploratory oil and gas wells on  
the Fort Berthold Reservation

Dear Ms. Ruffo:

This is in response to your November 24, 2009, letter regarding proposed exploratory oil and gas wells on the Fort Berthold Reservation. Zenergy Operating Company, LLC (Zenergy) has proposed five exploratory oil and gas wells on the Fort Berthold Reservation, Dunn County and McKenzie Counties, North Dakota.

Specific locations in Dunn County are:

Dakota-3 Beaks # 36-35H: T. 149 N., R. 93 W., Section 36, SE $\frac{1}{4}$ NE $\frac{1}{4}$

Dakota-3 Fox # 14-H: T. 149 N., R. 93 W., Section 8, SE $\frac{1}{4}$ SW $\frac{1}{4}$

Dakota-3 Rubia # 16-24H: T. 149N., R. 93 W., Section 24, SE $\frac{1}{4}$ SW $\frac{1}{4}$

Specific locations in McKenzie County are:

Dakota-3 Brugh # 31-30H: T. 149 N., R. 93 W., Section 31, SE $\frac{1}{4}$ SE $\frac{1}{4}$

Dakota-3 Stevenson # 16-8H: T. 149 N., R. 94 W., Section 8, SE $\frac{1}{4}$ SE $\frac{1}{4}$

We offer the following comments under the authority of and in accordance with the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.) (MBTA), the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.) (NEPA), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250) (BGEPA), Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds", the Endangered Species Act (16 U.S.C. 1531 et seq.) (ESA), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

In an e-mail dated October 13, 2009, the Bureau of Indian Affairs (BIA) designated SWCA to represent the BIA for informal Section 7 consultation under the ESA. Therefore, the U.S. Fish and Wildlife Service (Service) is responding to you as the designated non-Federal representative.

## Threatened and Endangered Species

A list of federally endangered and threatened species that may be present within the proposed project's area of influence is enclosed. This list fulfills requirements of the Service under Section 7 of the ESA. This list remains valid for 90 days. The BIA or designated non-Federal agent should make a determination of the proposed projects' effects on listed species, including whether there is anticipated destruction or adverse modification of designated critical habitat. This determination may be included in the EA. It should state whether or not the BIA plans to incorporate the Service's recommendations to avoid and minimize any adverse effects. If the BIA does not plan to take the recommended measures, the document should explain why not.

There is designated critical habitat for the piping plover in Dunn and McKenzie Counties. We recommend that a buffer of at least one-half mile be maintained from piping plover critical habitat. Critical habitat can be viewed on the Service website ([http://www.fws.gov/northdakotafieldoffice/endspecies/species/piping\\_plover.htm](http://www.fws.gov/northdakotafieldoffice/endspecies/species/piping_plover.htm)). GIS layers of critical habitat can be obtained by contacting our office at the letterhead address.

The Aransas Wood Buffalo Population (AWBP) of endangered whooping cranes is the only self-sustaining migratory population of whooping cranes remaining in the wild. These birds breed in the wetlands of Wood Buffalo National Park in Alberta and the Northwest Territories of northern Canada, and overwinter on the Texas coast. Whooping cranes in the AWBP annually migrate through North Dakota during their spring and fall migrations. They make numerous stops along their migration route to feed and roost before moving on.

Whooping cranes in the AWBP annually migrate through North Dakota during their spring and fall migrations. The proposed project lies within a 90 mile corridor that includes approximately 75 percent of all reported whooping crane sightings in the State (enclosure 1).

Whooping cranes are unlikely to spend more than a few days in any one spot during migration. The Service suggests that the Environmental Assessment (EA) include a requirement that if a whooping crane is sighted within one mile of a well site or associated facilities while it is under construction, that all work cease within one-mile of that part of the project and the Service be contacted immediately. In coordination with the Service, work may resume after the bird(s) leave the area.

Potential habitat for the Dakota skipper exists on the Fort Berthold Reservation in Dunn and McKenzie Counties. In 1995, the Dakota skipper was determined to be a candidate species under the ESA. No legal requirement exists to protect candidate species; however, it is within the spirit of the ESA to consider these species as having significant value and worth protecting.

The Dakota skipper is a small to medium-sized hesperiine butterfly associated with high quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed grass prairie.

The first type of habitat is relatively flat and moist native bluestem prairie. Three species of wildflowers are usually present: wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Zygadenus elegans*). The second habitat type is upland (dry) prairie that is often on ridges and hillsides. Bluestem grasses and needlegrasses dominate these habitats. On this habitat type, three wildflowers are typically present in high quality sites that are suitable for Dakota skipper: pale purple (*Echinacea pallida*) and upright (*E. angustifolia*) coneflowers and blanketflower (*Gaillardia sp.*). Because of the difficulty of surveying for Dakota skippers and a short survey window, we recommend that the project avoid any impacts to potential Dakota skipper habitat. If Dakota skipper habitat is present near the proposed project, and you intend to take precautions to avoid impacts to skipper habitat, please notify the Service for further direction.

### **Migratory Birds**

The MBTA has no provisions for incidental take. Regardless, it is understood that some birds may be killed even if all reasonable conservation measures are implemented. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, and through fostering relationships with individuals and industries seeking to eliminate their impacts to migratory birds. While it is not possible under the MBTA and BGEPA to absolve individuals or companies from liability by following these guidelines, enforcement will be focused on those individuals or companies that take migratory birds with disregard for the law, and where no legitimate conservation measures have been applied. Please inform us as to whether you intend to follow the following recommendations to minimize impacts to migratory birds, including bald and golden eagles.

Schedule construction for late summer or fall/early winter so as not to disrupt migratory birds or other wildlife during the breeding season (February 1 to July 15). If work is proposed to take place during the breeding season or at any other time which may result in the take of migratory birds, their eggs, or active nests, the Service recommends that the project proponent arrange to have a qualified biologist conduct a field survey of the affected habitats to determine the presence of nesting migratory birds. If nesting migratory birds, their eggs, or active nests are found, we request you contact this office, suspend construction, or take other measures, such as maintaining adequate buffers, to protect the birds until the young have fledged. The Service further recommends that field surveys for nesting birds, along with information regarding the qualifications of the biologist(s) performing the surveys, and any avoidance measures implemented at the project site be thoroughly documented and that such documentation be shared with the Service and maintained on file by the project proponent.

The Service estimates that 500,000 to 1 million birds are killed nationwide every year from exposed oil at oil drilling and/or production sites. The unauthorized take of migratory birds at oil production facilities can be prevented with a minimum of expense and effort. Wildlife mortalities in North Dakota are most often observed in association with drilling reserve pits, flare pits, and/or drip buckets and barrels. The Service strongly

recommends that the pads be constructed as closed-loop systems, without a reserve pit. Regardless of whether the pads are built with reserve pits, we recommend that the BIA include the following measures in the EA so as to ensure compliance with the MBTA.

- **Keep Oil Off Open Pits or Ponds.** Immediate clean up of oil in open pits is critical to prevent wildlife mortalities.
- **Place Covers on Drip Buckets/Barrels Located Under Valves and Spigots.** Bird entrapments are common within the small (55 gallon or less) barrels placed under valves and spigots to collect dripped oil. Placing a wire mesh or grate over the top of these barrels is a very practical way of preventing access for wildlife.
- **Use Effective and Proven Exclusionary Devices.** Netting is the most effective method of keeping birds from entering open pits (reserve and flare pits). Flagging, reflectors, and strobe lights are not effective. Published scientific studies as well as field inspections by Service personnel have documented bird mortalities at oil pits with flagging, reflectors, and strobe lights (e.g. Esmoil 1995). The effectiveness of netting pits to exclude birds and other wildlife depends on its installation. Effective installation requires a design allowing for snow-loading and one that also prevents ground entry by small mammals and birds. A maximum mesh size of 1.5 inches will allow for snow-loading and will exclude most birds. Nets or wire mesh over flare pits can be implemented if the flare tube is high enough to keep flame away from the net. Some examples of both effective and ineffective netting techniques can be found on the Service's website at <http://www.fws.gov/mountain%2Dprairie/contaminants/contaminants1c.html>.

Bald and/or golden eagles may use the project area where the proposed wells will be located. Golden eagles inhabit a wide variety of habitat types, including open grassland areas. They are known to nest on cliffs, in trees, manmade structures, and on the ground (Kochert et al. 2002). There are numerous records of golden eagle nests on the Fort Berthold reservation (Pers. Comm. Anne Marguerite Coyle, Dickinson State University). While the bald eagle tends to be more closely associated with forested areas near water (Buehler 2000), they have been found nesting in single trees several miles from the nearest water body. Therefore, there may also be potential habitat for the bald eagle at the proposed project sites. Especially early in the nesting season, eagles can be very sensitive to disturbance near the nest site and may abandon their nest as a result of low disturbance levels, even from foot traffic. A buffer of at least 1/2 mile should be maintained for golden and bald eagle nests. A permit is required for any take of bald or golden eagles or their nests. Permits to take golden eagles or their nests are available only for legitimate emergencies and as part of a program to protect golden eagles.

The Service recommends that aerial raptor surveys be conducted prior to any on-the-ground activities. The Service recommends that an aerial nest survey (preferably by helicopter) be conducted within 1.0-mile of any proposed ground disturbances to identify active and inactive nest sites near the proposed well pad and associated facilities,

including proposed new roads. Aerial surveys should be conducted between March 1 and May 15, before leaf-out so that nests are visible.

Aerial surveys should include the following:

1. Due to the ability to hover and facilitate observations of the ground, helicopters are preferred over fixed wing aircraft, although small aircraft may also be used for the raptor surveys. Whenever possible, two observers should be used to conduct the surveys. Even experienced observers only find approximately 50 percent of nests on a flight (Pers. Comm. Anne Marguerite Coyle, Dickinson State University), so we recommend that two flights be performed prior to any on-the-ground work, including other biological surveys or other work.
2. Observations of raptors and nest sites should be recorded using GPS. The date, location, nest condition, activity status, raptor species, and habitat should be recorded for each sighting.
3. We request that you share the qualifications of the biologist(s) conducting the survey, method of survey, and results of the survey with the Service.

### **High Value Habitat Avoidance**

To minimize disturbance to fish and wildlife habitat in the project area, the Service provides the following recommendations:

- Make no stream channel alterations or changes in drainage patterns.
- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels.
- Reseed disturbed areas with a mixture of native grass and forb species immediately after construction to reduce erosion.

### **Cumulative Effects Analysis**

A large number of wells and appurtenant facilities are being constructed in the western portion of North Dakota. The Service is concerned that the wells, and especially the associated roads, are being put in piecemeal without an overarching plan to ensure that the facilities are being constructed to access all new pads most efficiently, while disturbing the least amount of habitat. While we understand that there is still some level of uncertainty regarding the extent of the oil formations, there has been enough drilling in this area that the Service believes that the uncertainty is relatively small and decreasing. It would be appropriate for the EA to include some cumulative effects analysis of the existing and proposed pads, roads, electrical transmission lines, and preferably pipelines to transport the products.

## Habitat Fragmentation

Prairie habitat is increasingly being lost or fragmented because of the large number of wells and associated roads that are being constructed in areas of the State that were formerly relatively undeveloped. Only about 30% of native prairie in North Dakota remains from pre-settlement times (Strong et al. 2005), with nearly all native tallgrass prairie converted nationwide (Ricketts et al. 1999). Oil pads, associated roadways, and vehicle traffic can cause fragmentation of the landscape, disrupting wildlife patterns, and making it more likely that non-native plant species may invade an area. The Service recommends placing as few well pads as possible on the landscape and locating pads so as to avoid or minimize the construction of new roads. Many prairie species require large, contiguous blocks of grasslands for their biological needs and may either avoid patchy habitat or experience reduced reproductive success.

- The Service recommends that impacts to native prairie be avoided or minimized. If native prairie cannot be avoided, the Service recommends outlining stringent reclamation requirements, including a bond sufficient to cover the cost of reclamation, as described in the “Post-production Phase – Reclamation” section below.
- The Service recommends that oil wells use existing roads and trails to the greatest extent possible, minimizing all new road construction.
- If a new road is necessary, the Service recommends avoiding native prairie to the greatest extent possible.
- If new roads are constructed, the Service recommends that the disturbed areas along the road be reseeded immediately with a native prairie mix to reduce erosion and prevent invasion by non-native species. Disturbed areas should be monitored regularly throughout the life of the project, and treated with herbicide as necessary to ensure that exotic species are not infesting disturbed areas.
- If multiple companies are developing well pads in the same general area, roads should be shared to the greatest extent possible to minimize disturbance.
- Install and maintain appropriate erosion control measures to reduce sedimentation and water quality degradation of wetlands and streams near the project area.

The Service recommends that the BIA incorporate the relevant requirements described in the Dakota Prairie Grasslands Land and Resource Management Plan (USDA 2001). This document includes a number of requirements to avoid sensitive resources. In particular, the Service suggests that the BIA incorporate the relevant portions of Appendix D, Oil and Gas Stipulations.

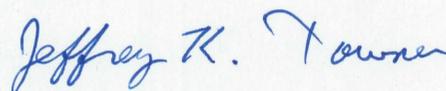
## Post-production Phase – Reclamation

Each project should include a plan to restore the landscape following project completion, including a bond sufficient to reclaim the area in full. Within one year of a well's closure, the well pads, roads, and associated facilities should be completely removed from the landscape, the land re-contoured back to its original profile, and the area reseeded with a native prairie mix. Since native prairie species take some time to establish, and intensive management may be required for several years to ensure that weeds do not infest the area, the Service recommends that the BIA follow the timeline requirements set out in the 2003 *North Dakota Public Service Commission, Standards for evaluation of revegetation success and recommended procedures for pre-and postmining vegetation assessments* (available on-line at <http://www.psc.state.nd.us/jurisdiction/reclamation/files/revegdocusjuly2003final.pdf>). This document requires that reclaimed areas be managed for a minimum of ten years, starting in the year when first seeded. Starting in the sixth year, for at least two consecutive years, or three out of the last five, including the last year, the reclaimed area must meet the approved standard as described in the document.

For prairie areas, the Service recommends planting a diverse mixture of native cool and warm season grasses and forbs. While the North Dakota Public Service Commission document requires only five native grass species, recent research has suggested that a more diverse mix, including numerous forb species, is not only ecologically beneficial, but is also more weed resistant, allowing for less intensive management and chemical use. In essence, the more species included in a mixture, the higher the probability of providing competition to resist invasion by non-native plants. The seed source should be as local as possible, preferably collected from the nearby native prairie.

Thank you for the opportunity to comment on this project. If you require further information or the project plans change, please contact me or Carol Aron of my staff at (701) 250-4481 or at the letterhead address.

Sincerely,



Jeffrey K. Towner  
Field Supervisor  
North Dakota Field Office

Enclosures

cc: Bureau of Indian Affairs, Aberdeen  
(Attn: Marilyn Bercier)  
Bureau of Land Management, Dickinson  
ND Game & Fish Depart, Bismarck

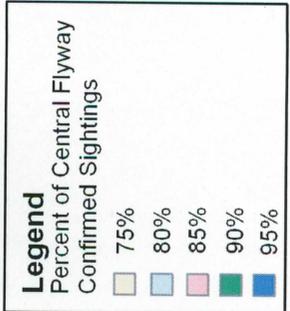
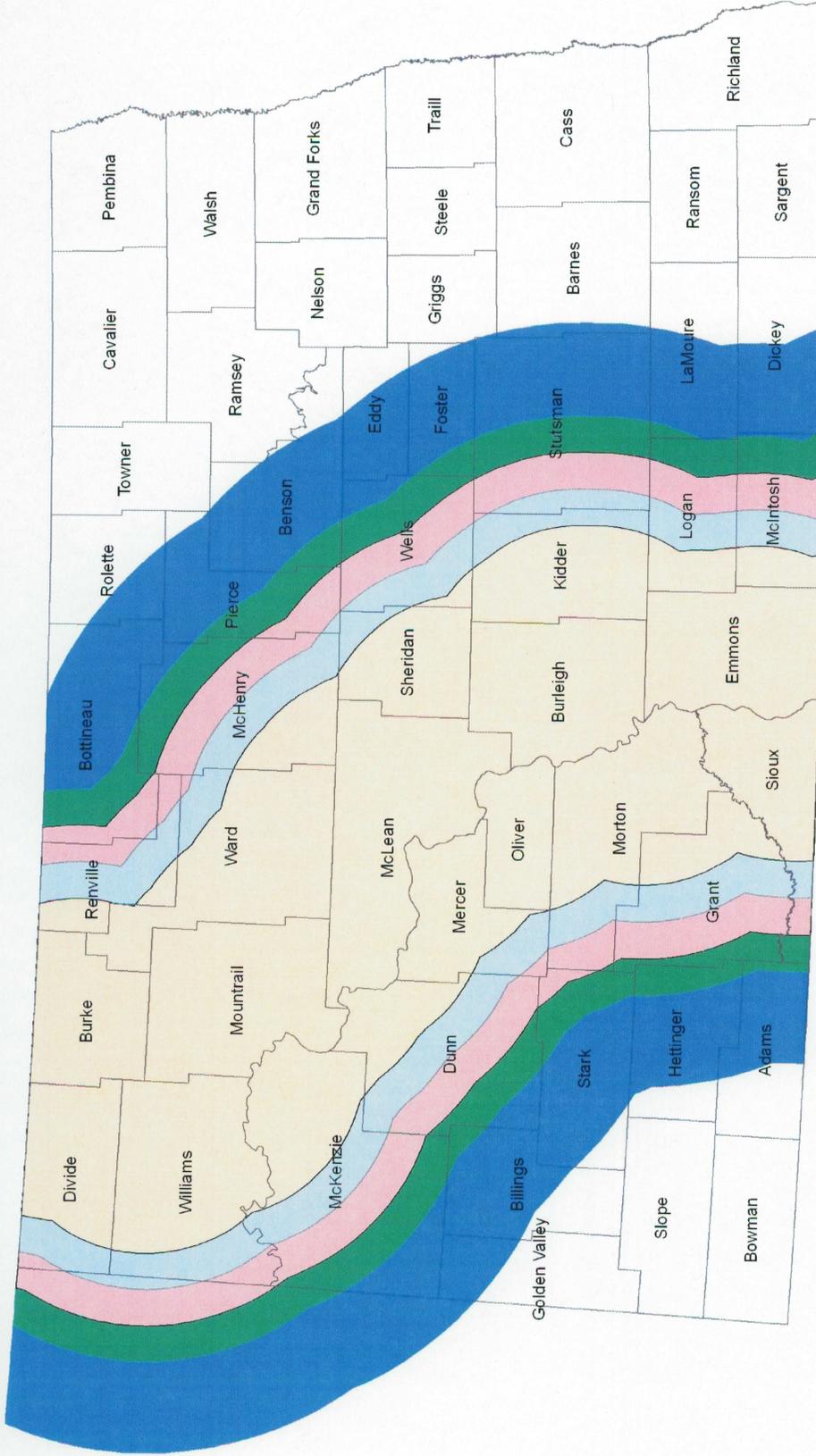
## Literature Cited

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- USDA. 2001. Land and resource management plan for the Dakota Prairie Grasslands Northern Region. Accessed October 13, 2009. Available at [http://www.fs.fed.us/ngp/plan/feis\\_plan\\_dakota\\_prairie.htm](http://www.fs.fed.us/ngp/plan/feis_plan_dakota_prairie.htm).



U.S. Fish and Wildlife Service

North Dakota and Montana Whooping Crane Migration Corridor  
Central Flyway of the United States



Produced for Ecological Services  
Grand Island, NE  
Current to: 2007

FEDERAL THREATENED, ENDANGERED, AND CANDIDATE SPECIES  
AND DESIGNATED CRITICAL HABITAT FOUND IN  
DUNN COUNTY, NORTH DAKOTA  
December 2009

**ENDANGERED SPECIES**

Birds

Interior least tern (*Sterna antillarum*): Nests along midstream sandbars of the Missouri and Yellowstone Rivers.

Whooping crane (*Grus Americana*): Migrates through west and central counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Young adult summered in North Dakota in 1989, 1990, and 1993. Total population 140-150 birds.

Fish

Pallid sturgeon (*Scaphirhynchus albus*): Known only from the Missouri and Yellowstone Rivers. No reproduction has been documented in 15 years.

Mammals

Black-footed ferret (*Mustela nigripes*): Exclusively associated with prairie dog towns. No records of occurrence in recent years, although there is potential for reintroduction in the future.

Gray wolf (*Canis lupus*): Occasional visitor in North Dakota. Most frequently observed in the Turtle Mountains area.

**THREATENED SPECIES**

Birds

Piping plover (*Charadrius melodus*): Nests on midstream sandbars of the Missouri and Yellowstone Rivers and along shorelines of saline wetlands. More nest in North Dakota than any other state.

## **CANDIDATE SPECIES**

### Invertebrates

Dakota skipper (Hesperia dacotae): Found in native prairie containing a high diversity of wildflowers and grasses. Habitat includes two prairie types: 1) low (wet) prairie dominated by bluestem grasses, wood lily, harebell, and smooth camas; 2) upland (dry) prairie on ridges and hillsides dominated by bluestem grasses, needlegrass, pale purple and upright coneflowers and blanketflower.

## **DESIGNATED CRITICAL HABITAT**

### Birds

Piping Plover - Lake Sakakawea - Critical habitat includes sparsely vegetated shoreline beaches, peninsulas, islands composed of sand, gravel, or shale, and their interface with the water bodies.

FEDERAL THREATENED, ENDANGERED, AND CANDIDATE SPECIES  
AND DESIGNATED CRITICAL HABITAT FOUND IN  
MCKENZIE COUNTY, NORTH DAKOTA  
December 2009

**ENDANGERED SPECIES**

Birds

Interior least tern (*Sterna antillarum*): Nests along midstream sandbars of the Missouri and Yellowstone Rivers.

Whooping crane (*Grus Americana*): Migrates through west and central counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Young adult summered in North Dakota in 1989, 1990, and 1993. Total population 140-150 birds.

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Natural Resources Conservation Service  
P.O. Box 1458  
Bismarck, ND 58502-1458

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December 8, 2009

Sarah J. Ruffo  
SWCA Environmental Consultants  
Bismarck Office  
115 North 4<sup>th</sup> St., Suite 1  
Bismarck, ND 58501

RE: The proposed action includes approval by the BIA and BLM for the construction, drilling, completion and production of five exploratory oil and gas wells on the Fort Berthold Reservation by Zenergy Operating Company, LLC (Zenergy). McKenzie and Dunn Counties, ND

Dear Ms. Ruffo:

The Natural Resources Conservation Service (NRCS) has reviewed your letter dated November 23, 2009, regarding the approval of five pipelines on the Fort Berthold Reservation, McKenzie and Dunn Counties, North Dakota.

*Important Farmlands* - NRCS has a major responsibility with FPPA in documenting conversion of farmland (i.e., prime, statewide, and local importance) to non-agricultural use. It appears your proposed project is not supported by federal funding or actions; therefore, no further action is required.

*Wetlands* – The Wetland Conservation Provisions of the 1985 Food Security Act, as amended, provide that if a USDA participant converts a wetland for the purpose of, or to have the effect of, making agricultural production possible, loss of USDA benefits could occur. NRCS has developed the following guidelines for the installation of buried utilities. If these guidelines are followed, the impacts to the wetland(s) will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements: 1) Disturbance to the wetland(s) must be temporary, 2) no drainage of the wetland(s) is allowed (temporary or permanent), 3) mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained, 4) temporary side cast material must be placed in such a manner not to be dispersed in the wetland, and 5) all trenches must be backfilled to the original wetland bottom elevation.



Ms. Ruffo  
Page 2

NRCS would recommend that impacts to wetlands be avoided. If the project requires passage through or disturbance of a wetland, NRCS can complete a certified wetland determination, if requested by the landowner/operator.

If you have additional questions pertaining to FPPA, please contact Steve Sieler, State Soil Liaison, at (701) 530-2019.

Sincerely,

A handwritten signature in blue ink, appearing to read "John Glover", is written over the typed name.

JOHN GLOVER  
Acting State Conservationist

cc:  
Kyle Hartel, DC, NRCS, Watford City, ND  
Susan Tuhy, DC, NRCS, Killdeer, ND  
Terry Gisvold, ASTC (FO), NRCS, Dickinson, ND



December 1, 2009

Sarah Ruffo, Environmental Specialist  
SWCA Environmental Consultants  
115 North 4<sup>th</sup> Street, Suite 1  
Bismarck, ND 58501

Re: Zenergy Operating Co., LLC  
Five Exploratory Oil & Gas Wells on  
Fort Berthold Reservation, Dunn and McKenzie Counties

Dear Ms. Ruffo:

This department has reviewed the information concerning the above-referenced project submitted under date of November 24, 2009 with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. Development of the production facilities and any access roads or well pads should have a minimal effect on air quality provided measures are taken to minimize fugitive dust. However, operation of the wells has the potential to release air contaminants capable of causing or contributing to air pollution. We encourage the development and operation of the wells in a manner that is consistent with good air pollution control practices for minimizing emissions.
2. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.
3. Oil and gas related construction activities located within tribal boundaries within North Dakota may be required to obtain a permit to discharge storm water runoff from the U.S. Environmental Protection Agency. Further information may be obtained from the U.S. EPA's website or by calling the U.S. EPA – Region 8 at (303) 312-6312. Also, cities or counties may impose additional requirements and/or specific best management practices for

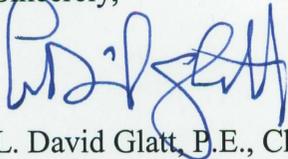
construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

A handwritten signature in blue ink, appearing to read "L. David Glatt".

L. David Glatt, P.E., Chief  
Environmental Health Section

LDG:cc  
Attach.



## Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

### **Soils**

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

### **Surface Waters**

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

### **Fill Material**

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.



"VARIETY IN HUNTING AND FISHING"

## NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

December 21, 2009

Sarah Ruffo  
Environmental Specialist  
SWCA Environmental Consultants  
115 North 4<sup>th</sup> Street, Suite 1  
Bismarck, ND 58501

Dear Ms. Ruffo:

RE: Exploratory Oil & Gas Wells  
Forth Berthold Reservation

Zenergy Operating Company, LLC has proposed five exploratory oil and gas wells on the Fort Berthold Reservation in sections 8, 24 & 36, T149N, R93W, of Dunn County; and sections 8 & 31, T149N, R94W, of McKenzie County, North Dakota.

Our primary concern with oil and gas development is the fragmentation and loss of wildlife habitat associated with construction of the well pads and access roads. We recommend that construction be avoided to the extent possible within native prairie, wooded draws, riparian corridors, and wetland areas.

We also suggest that botanical surveys be completed during the appropriate season and aerial surveys be conducted for raptor nests before construction begins.

Sincerely,

(for)

Michael G. McKenna  
Chief  
Conservation & Communication Division

js



John Hoeven, Governor  
Douglass A. Prchal, Director

1600 East Century Avenue, Suite 3  
Bismarck, ND 58503-0649  
Phone 701-328-5357  
Fax 701-328-5363  
E-mail [parkrec@nd.gov](mailto:parkrec@nd.gov)  
[www.parkrec.nd.gov](http://www.parkrec.nd.gov)

December 21, 2009

Sarah J. Ruffo  
SWCA Environmental Consultants  
115 North 4<sup>th</sup> St., Ste 1  
Bismarck, ND 58501

Re: Five Exploratory Oil and Gas Wells  
Fort Berthold Reservation

Dear Ms. Ruffo:

The North Dakota Parks and Recreation Department has reviewed the above referenced project proposal to drill five exploratory oil and gas wells located in Sections 8, 24, and 36, T149N, R93W, Dunn County; and Sections 8 and 31, T149N, R94W, McKenzie County.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare species and ecological communities). The project as defined does not affect state park lands that we manage or Land and Water Conservation Fund recreation projects that we coordinate.

The North Dakota Parks and Recreation Department is responsible for coordinating North Dakota's Scenic Byway and Backway Program. This proposed project is in proximity to the Killdeer Mountain Four Bears Scenic Byway and as such we recommend any project development be completed with the least amount of or no visual impact to the immediate and distant views from that Byway. North Dakota Parks and Recreation Department staff should be contacted at 701-328-5355 to assist in mitigation of any potential impacts.

The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any current or historic plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, there are no known occurrences within or adjacent to the project area.

Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

Thank you for the opportunity to comment on this project. Please contact Kathy Duttonhefner (701-328-5370 or [kgduttonhefner@nd.gov](mailto:kgduttonhefner@nd.gov)) of our staff if additional information is needed.

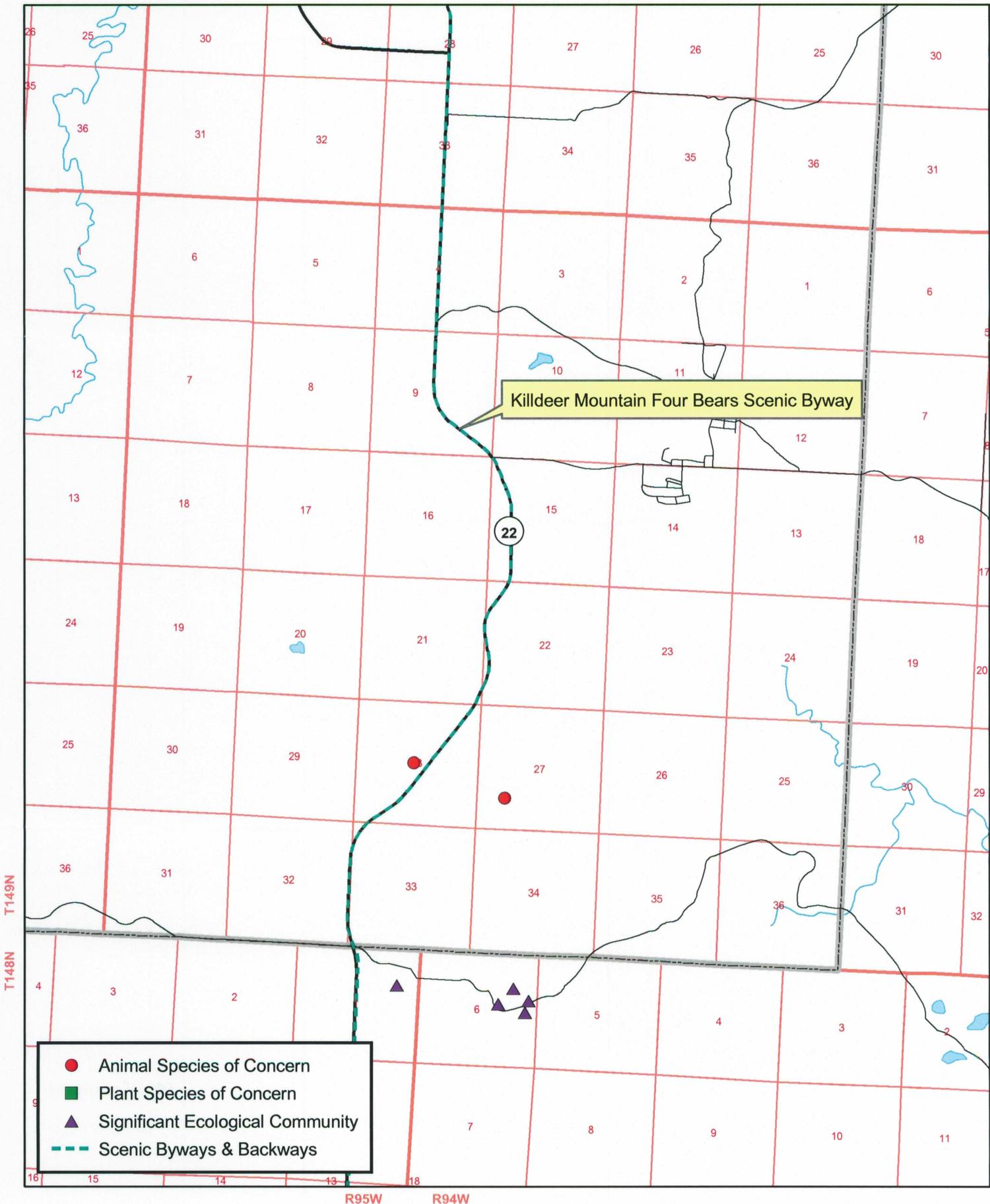
Sincerely,

Jesse Hanson, Coordinator  
Planning and Natural Resources Division

R.USNDNHI\*375

.....  
*Play in our backyard!*

# North Dakota Natural Heritage Inventory Species of Concern and Significant Ecological Communities





**STATE  
HISTORICAL  
SOCIETY  
OF NORTH DAKOTA**

John Hoeven  
*Governor of North Dakota*

North Dakota  
State Historical Board

Chester E. Nelson, Jr.  
*Bismarck - President*

Gereld Gerntholz  
*Valley City - Vice President*

Richard Kloubec  
*Fargo - Secretary*

Albert I. Berger  
*Grand Forks*

Calvin Grinnell  
*New Town*

Diane K. Larson  
*Bismarck*

A. Ruric Todd III  
*Jamestown*

Sara Otte Coleman  
*Director  
Tourism Division*

Kelly Schmidt  
*State Treasurer*

Alvin A. Jaeger  
*Secretary of State*

Douglass Prchal  
*Director  
Parks and Recreation  
Department*

Francis Ziegler  
*Director  
Department of Transportation*

Merlan E. Paaverud, Jr.  
*Director*

*Accredited by the  
American Association  
of Museums*

December 3, 2009

Ms Sarah J Ruffo  
SWCA Environmental Consultants  
Bismarck Office 115 North 4<sup>th</sup> St, Suite 1  
Bismarck ND 58501

**NDSHPO REF. 10-0303 BIA/BLM/MHAN Environmental Assessment for five  
exploratory oil and gas wells on the Fort Berthold Reservation by Zenergy Operating  
Company, LLC in Dunn and McKenzie Counties, North Dakota  
Dakota 3 – Beaks 36-35H SE ¼ NE 1/5 [T149N R93W Section 36]  
Fox 14-8H SE ¼ SW ¼ [T149N R93W Section 8]  
Rubia 16-24H SE ¼ SE ¼ [T149N R93W Section 24]  
Brugh 31-30H SE ¼ SE ¼ [T149N R94 W Section 31]  
Stevenson 16-8H SE1/4 SE1/4 [T149N R94W Section 8]**

Dear Ms. Ruffo,

We received your letter regarding NDSHPO REF. 10-0303 BIA/BLM/MHAN Environmental Assessment for five exploratory oil and gas wells on the Fort Berthold Reservation by Zenergy Operating Company, LLC in Dunn and McKenzie Counties, North Dakota. We request that a copy of cultural resource site forms and reports be sent to this office so that the cultural resources archives can be kept current. Perhaps one might consider putting TCP (Traditional Cultural Properties) related information in separate reports not sent to this office.

Thank you for your consideration. Consultation is with MHAN THPO. If you have any questions please contact Susan Quinnell, Review & Compliance Coordinator at (701)328-3576 or [squinnell@nd.gov](mailto:squinnell@nd.gov)

Sincerely,

Merlan E. Paaverud, Jr.  
State Historic Preservation Officer (North Dakota)  
and Director, State Historical Society of North Dakota

**Sarah Ruffo**

---

**From:** Kade Ferris [kade@tribalresources.com]  
**Sent:** Friday, December 11, 2009 12:28 PM  
**To:** Sarah Ruffo  
**Subject:** Consultation with the Turtle Mountain Band of Chippewa

TURTLE MOUNTAIN BAND OF CHIPPEWA INDIANS - DEPARTMENT OF NATURAL  
RESOURCES  
12/11/2009

Dear Ms. Ruffo,

We have received your letter regarding the following well projects on the Ft. Berthold Indian  
Reservation:

- Dakota 3 Breaks #36-35H
- Dakota 3 Fox #14-8H
- Dakota 3 Rubin #16-24H
- Dakota 3 Bruch #31-30H
- Dakota 3 Stevenson #16-8H

It is the position of the Turtle Mountain Band of Chippewa Indians that none of these projects will affect  
cultural of natural resources of concern or interest to the Tribe.

In addition, this letter shall serve as notice that for all future correspondence for projects where SWCA  
must consult with, or notify, Indian Tribes the official point of contact shall be:

Mr. Kade M. Ferris M.S., Director  
Natural/Cultural Resources Division  
Turtle Mountain Band of Chippewa Indians  
PO Box 900  
Belcourt, ND 58316  
Phone (701) 477-2650  
Cell (701) 550-0867

Please make sure to update this contact information company-wide at SWCA.

Thank you for your time and consideration to consult with the Turtle Mountain Band of Chippewa  
Indians. Good luck with your projects.

Sincerely,

Kade M. Ferris M.S.

# **Notice of Availability and Appeal Rights**

Zenergy: Dakota-3 Black Hawk #15-34H  
Dakota-3 Rubia #16-24H  
Dakota-3 Beaks #36-35H  
Dakota-3 Stevenson #15-8H  
Dakota-3 KYW #27-34H

**The Bureau of Indian Affairs (BIA) is planning to issue administrative approvals related to installation of five oil/gas wells and related infrastructure as shown on the attached map. Construction by Zenergy is expected to begin in the Spring of 2010.**

**An environmental assessment (EA) determined that proposed activities will not cause significant impacts to the human environment. An environmental impact statement is not required. Contact Howard Bemer, Superintendent at 701-627-4707 for more information and/or copies of the EA and the Finding of No Significant Impact (FONSI).**

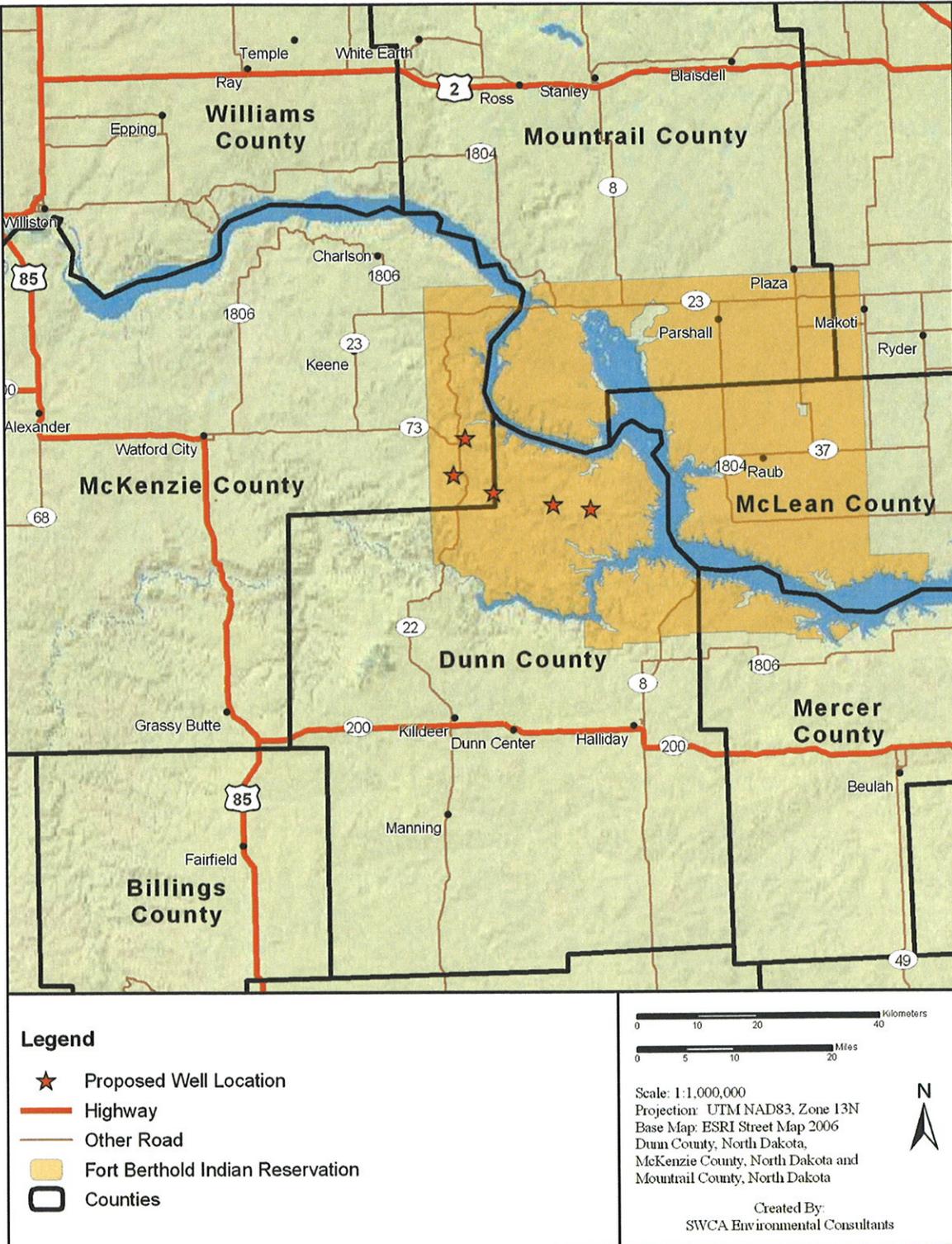
**The FONSI is only a finding on environmental impacts – it is not a decision to proceed with an action and *cannot* be appealed. BIA's decision to proceed with administrative actions *can* be appealed until April 4, 2010 by contacting:**

**United States Department of the Interior  
Office of Hearings and Appeals  
Interior Board of Indian Appeals  
801 N. Quincy Street, Suite 300, Arlington, Va 22203.**

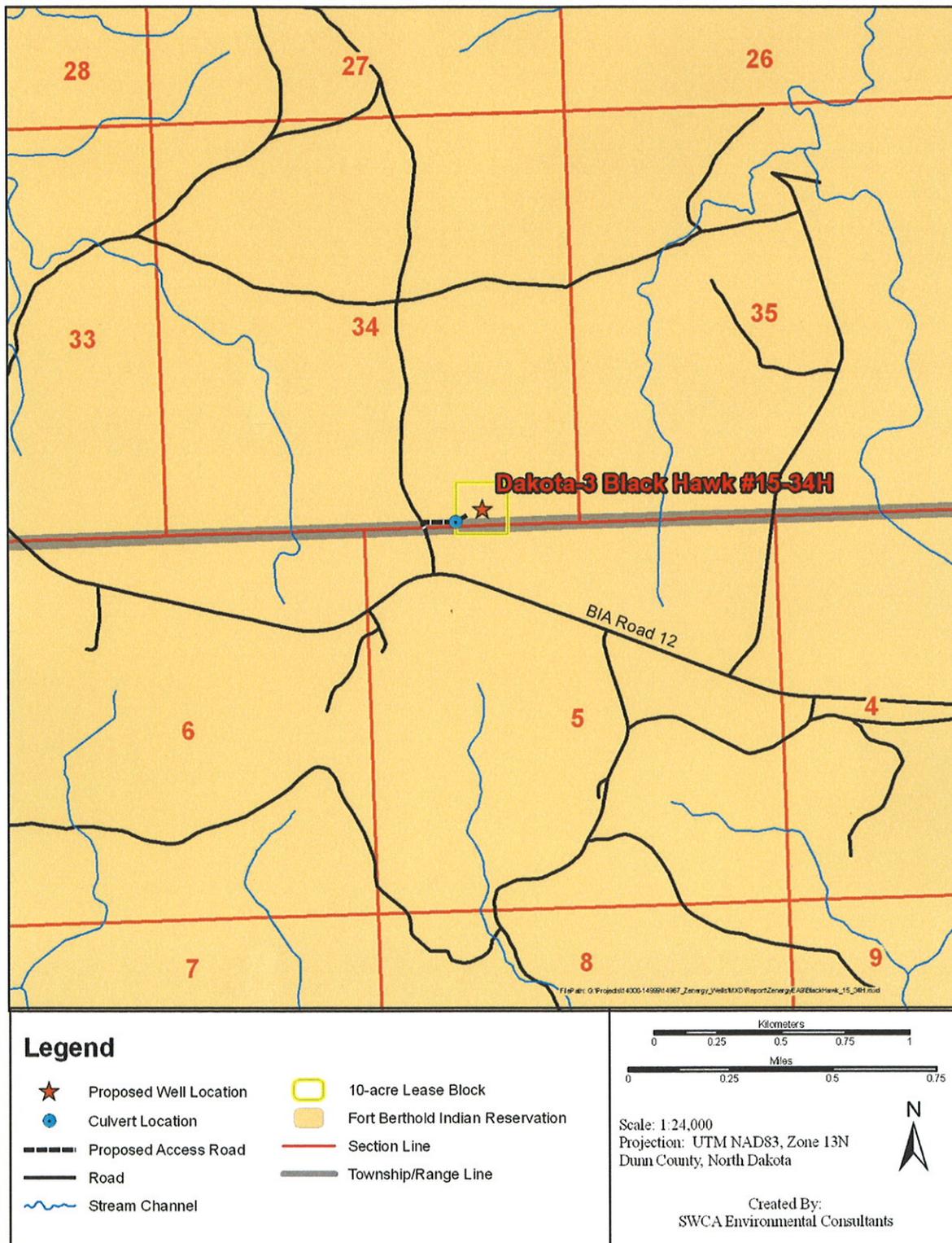
**Procedural details are available from the BIA Fort Berthold Agency at 701-627-4707.**



**Project locations.**







**Figure 1. Dakota-3 Black Hawk #15-34H proposed location.**

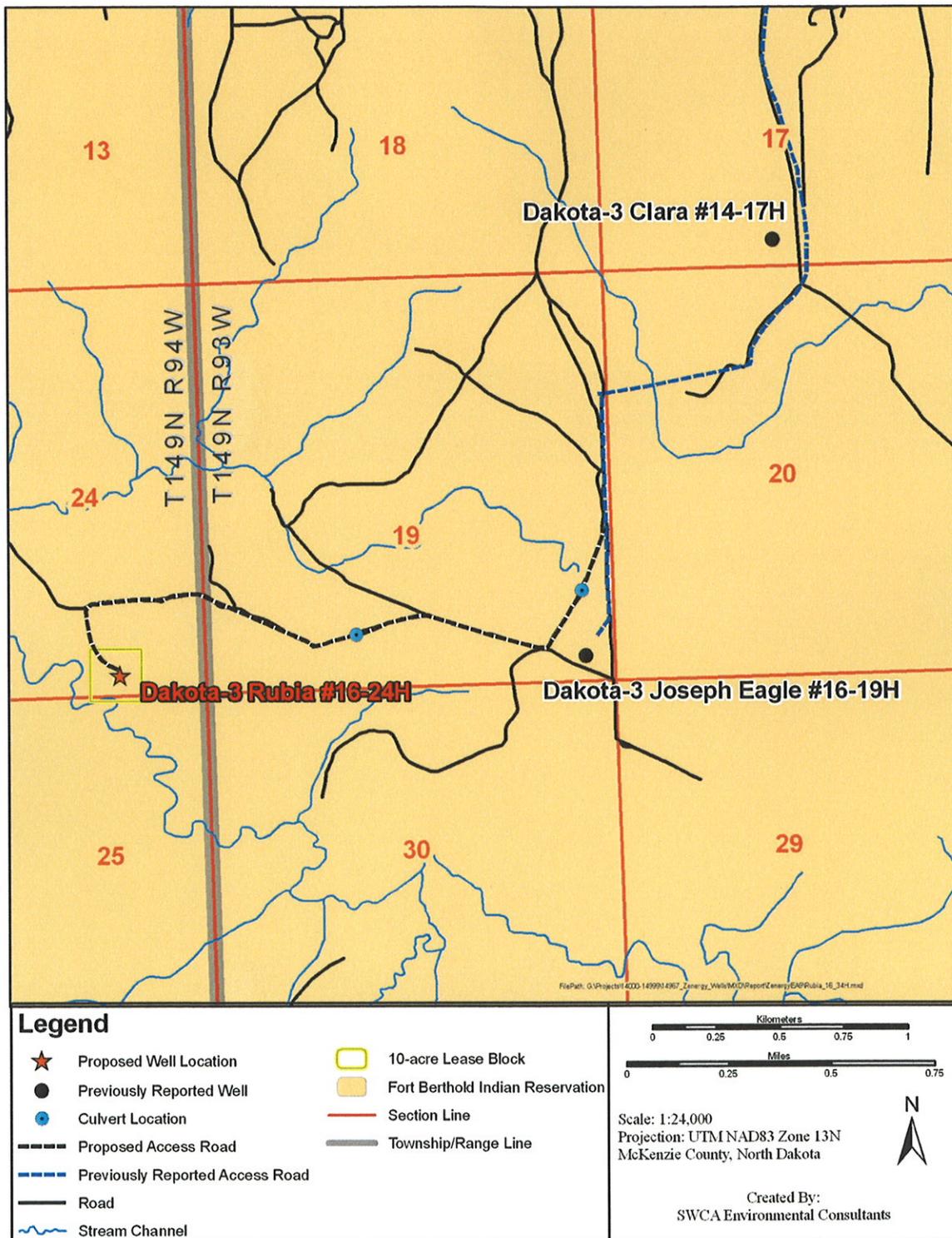
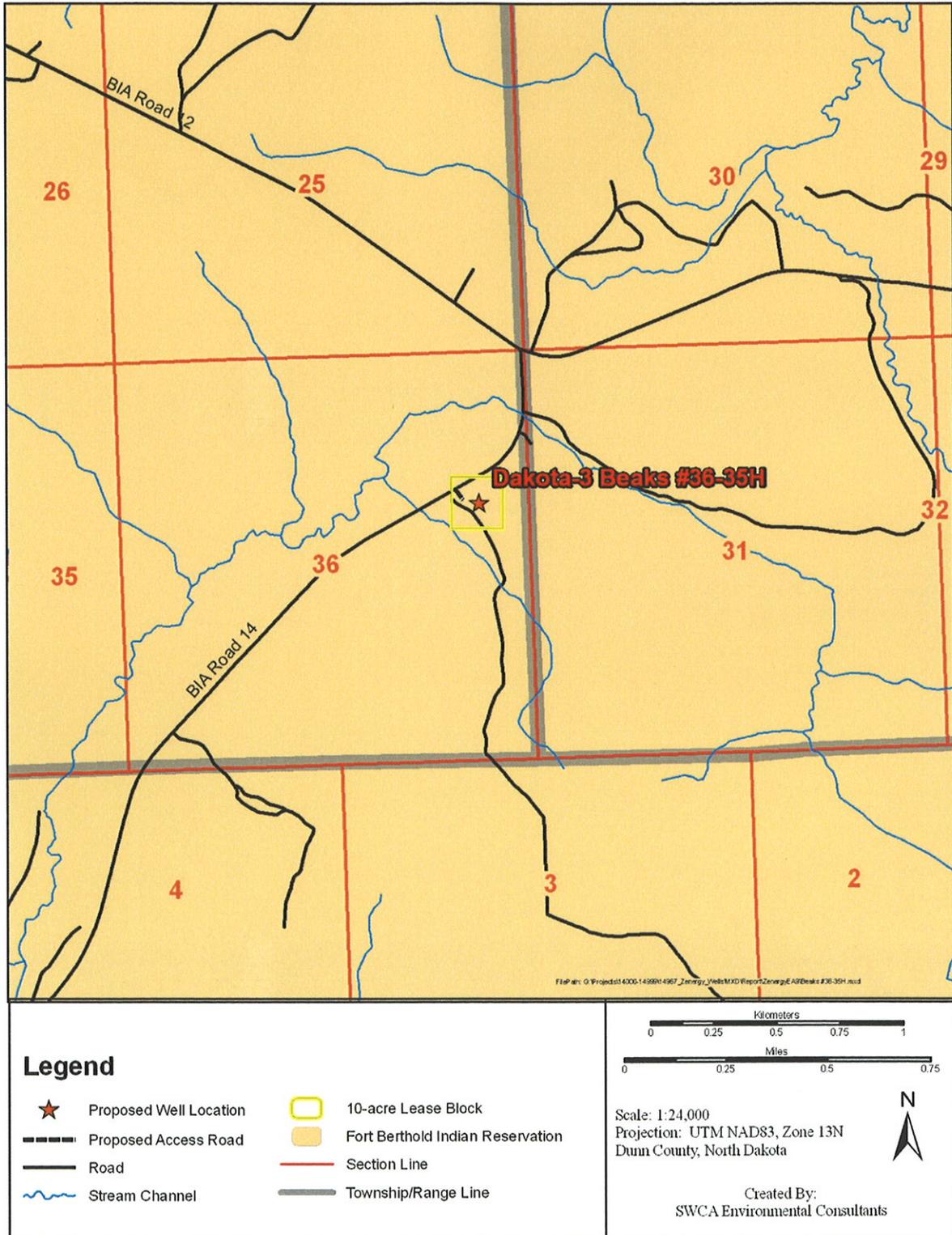
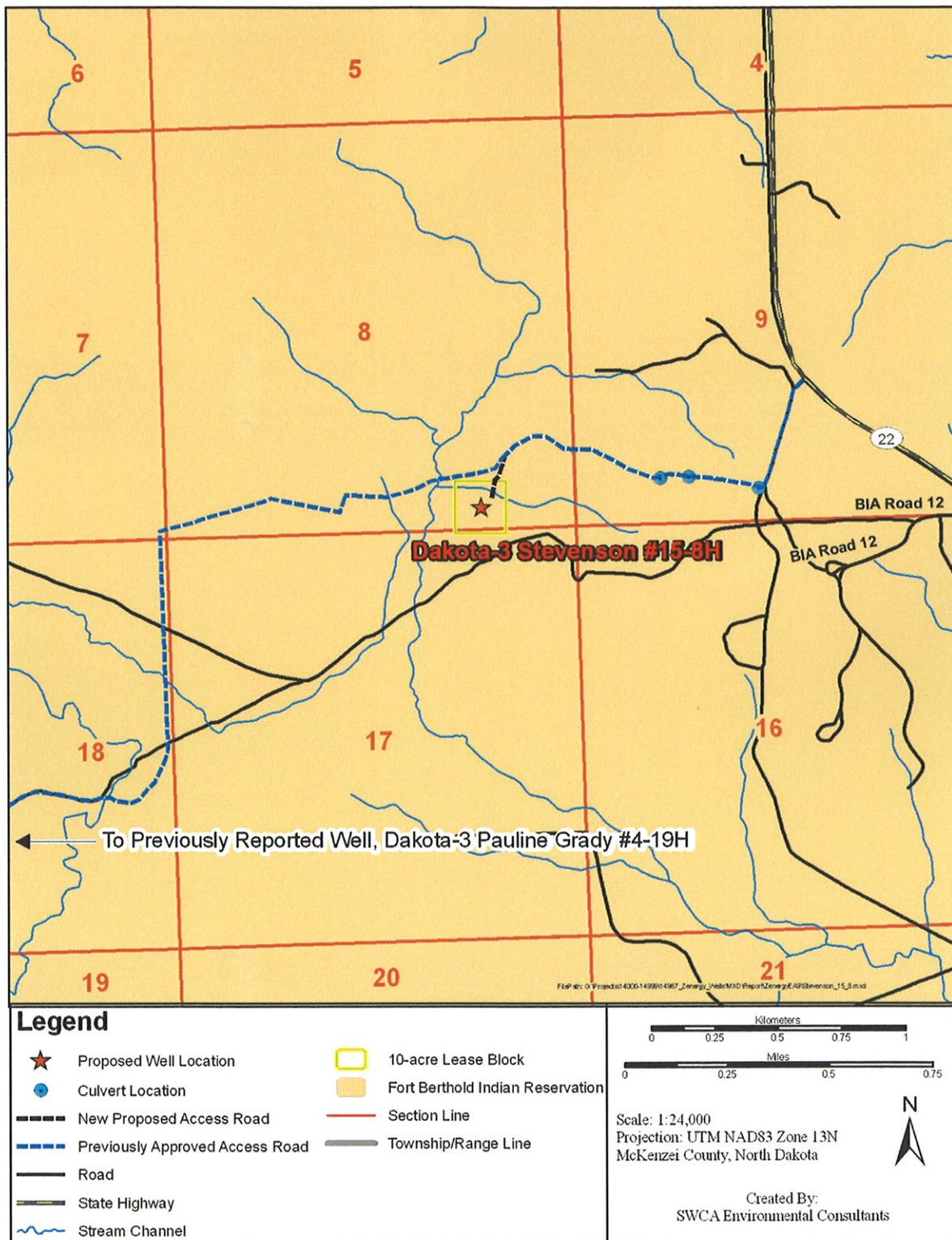


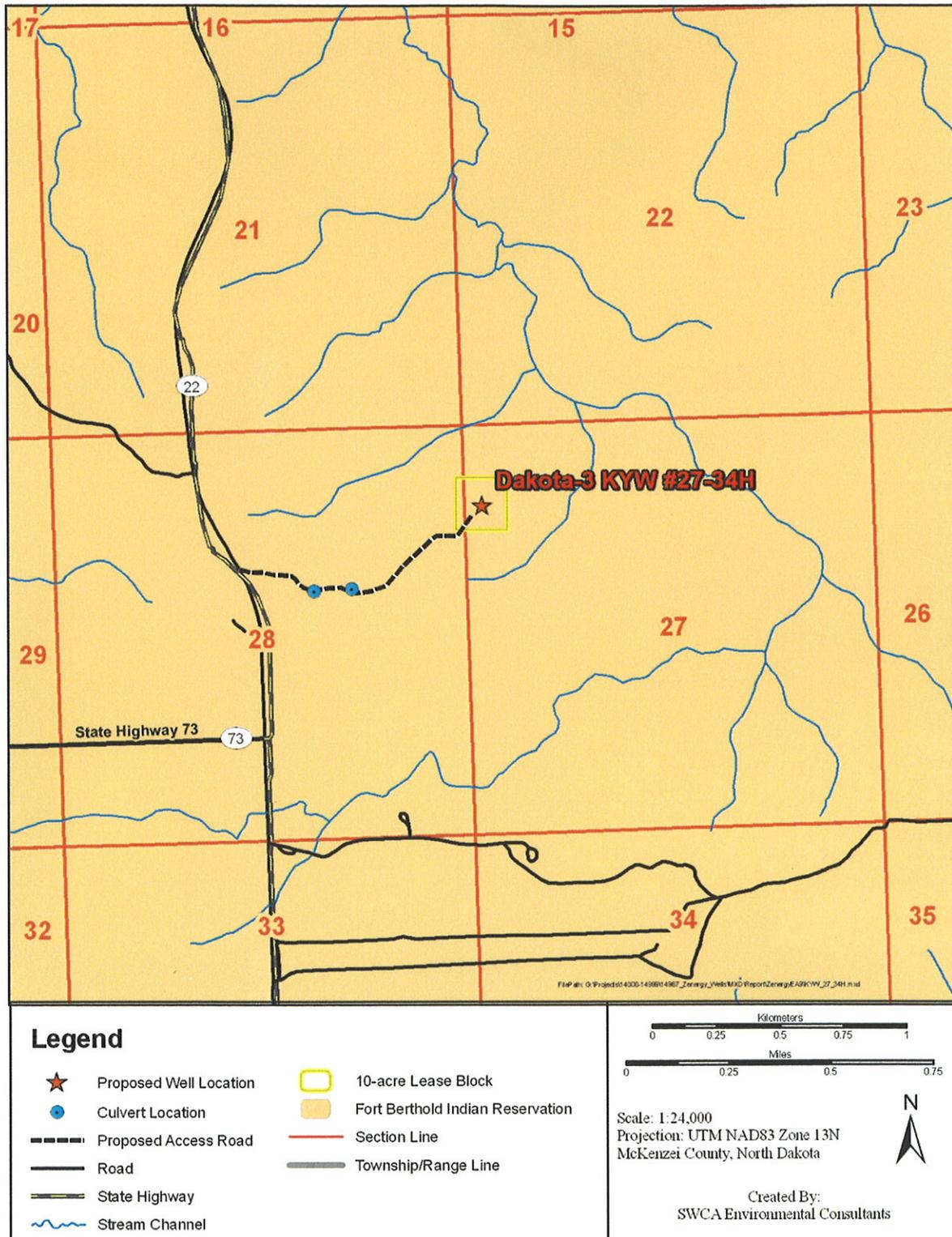
Figure 2. Dakota-3 Rubia #16-24H proposed location.



**Figure 3. Dakota-3 Beaks #36-35H proposed location.**



**Figure 4. Dakota-3 Stevenson #15-8H proposed location.**



**Figure 5. Dakota-3 KYW #27-34H proposed location.**