United States Department of the Interior

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

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
DESCRM
MC-208

FEB 10 2011

MEMORANDUM

TO: Superintendent, Fort Berthold Agency

FROM: Acting 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 sixteen proposed exploratory drilling wells from six pads by Enerplus 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.

Diane Mann-Klage

Attachment

cc: Tex Hall, Chairman, Three Affiliated Tribes (with attachment)
Elgin Crows Breast, THPO (with attachment)
Derek Enderud, BLM, Dickenson, ND (with attachment)
John Shelman, US Army Corps of Engineers
Jeffrey Hunt, Virtual One Stop Shop

Finding of No Significant Impact

Enerplus Resources (USA) Corporation

Environmental Assessment for 16 Exploratory Bakken and Three Forks Oil Wells

Fort Berthold Indian Reservation
Dunn County, North Dakota

The U.S. Bureau of Indian Affairs (BIA) has received a proposal to authorize the land use by Enerpus for the drilling of 16 horizontal oil and gas wells: Axe 148-94-11A-1H, Vise 148-94-11A-2H, Poblano 148-94-02D-1H, Cayenne 148-94-02D-2H, Anvil 148-94-11B-4H, Jalapeno 148-94-02C-3H, Habanero 148-94-02C-4H, Forge 148-94-11B-3H, Pine 148-94-12D-01-3H, Cedar 148-94-12D-01-4H, Oak 148-94-12C-01-1H, Spruce 148-94-12C-01-2H, Hawaii 148-94-23A-1H, Maui 148-94-23A-4H, NS Kona 148-94-23B-3H, Hilo 148-94-23B-2H; on six pad locations in Dunn County, North Dakota. The proposed gathering pipelines would transport oil, gas, and produced water from productive wells to markets and disposal facilities on the Fort Berthold Indian Reservation. 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.

Potential of the proposed actions to impact the human environment is analyzed in the attached addendum to an existing Environmental Assessment (EA), as required by the National Environmental Policy Act. Based on the recently completed addendum to the EA, I have determined that the proposed project 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. This guidance includes 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", and the Endangered Species Act (16 U.S.C. 1531 et seq.) (ESA).

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.

Acting Diane Mann-Klage
Regional Director

February 10, 2011
Date

Environmental Assessment: Enerplus Resources (USA) Corporation: 16 Exploratory Bakken and Three Forks Oil Wells

Prepared for

United States Department of the Interior
Bureau of Indian Affairs

Prepared by

SWCA Environmental Consultants

February 2011

ENVIRONMENTAL ASSESSMENT

United States Department of the Interior
Bureau of Indian Affairs

Great Plains Regional Office
Aberdeen, South Dakota

Cooperating Agency:

Bureau of Land Management

North Dakota Field Office
Dickinson, North Dakota

Enerplus Resources (USA) Corporation

16 Exploratory Bakken and Three Forks Oil Wells:

NWNE Section 11, T148N, R94W

Axe 148-94-11A-1H — **Vise 148-94-11A-2H TF**
Poblano 148-94-02D-1H — **Cayenne 148-94-02D-2H TF**

NENW Section 11, T148N, R94W

Anvil 148-94-11B-4H TF — **Jalapeno 148-94-02C-3H**
Habanero 148-94-02C-4H TF — **Forge 148-94-11B-3H**

SWSE Section 12, T148N, R94W

Pine 148-94-12D-01-3H — **Cedar 148-94-12D-01-4H TF**

SESW Section 12, T148N, R94W

Oak 148-94-12C-01-1H — **Spruce 148-94-12C-01-2H TF**

NWNE Section 23, T148N, R94W

Hawaii 148-94-23A-1H — **Maui 148-94-23A-4H TF**

NENW Section 23, T148N, R94W

Kona 148-94-23B-3H — **Hilo 148-94-23B-2H TF**

Fort Berthold Indian Reservation

February 2011

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

Enerplus Resources (USA) Corporation (Enerplus) has acquired the leases and is proposing to drill 16 horizontal oil and gas wells on six pad locations 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 County, 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. Development has been proposed in locations that target specific areas in the Bakken and Three Forks formations, known oil reserves. The following proposed well sites, shown in Figure 1.1, would be located within the Reservation in which the majority of the external boundaries are located above the Bakken and Three Forks formations.

- **Axe 148-94-11A-1H**: NW¼ NE¼ of Section 11, Township (T) 148 North (N), Range (R) 94 West (W), Dunn County
- **Vise 148-94-11A-2H TF**: NW¼ NE¼ of Section 11, T148N, R94W, Dunn County
- **Poblano 148-94-02D-1H**: NW¼ NE¼ of Section 11, T148N, R94W, Dunn County
- **Cayenne 148-94-02D-2H TF**: NW¼ NE¼ of Section 11, T148N, R94W, Dunn County
- **Anvil 148-94-11B-4H TF**: NE¼ NW¼ of Section 11, T148N, R94W, Dunn County
- **Jalapeno 148-94-02C-3H**: NE¼ NW¼ of Section 11, T148N, R94W, Dunn County
- **Habanero 148-94-02C-4H TF**: NE¼ NW¼ of Section 11, T148N, R94W, Dunn County
- **Forge 148-94-11B-3H**: NE¼ NW¼ of Section 11, T148N, R94W, Dunn County
- **Pine 148-94-12D-01-3H**: SW¼ SE¼ of Section 12, T148N, R94W, Dunn County
- **Cedar 148-94-12D-01-4H TF**: SW¼ SE¼ of Section 12, T148N, R94W, Dunn County
- **Oak 148-94-12C-01-1H**: SE¼ SW¼ of Section 12, T148N, R94W, Dunn County
- **Spruce 148-94-12C-01-2H TF**: SE¼ SW¼ of Section 12, T148N, R94W, Dunn County
- **Hawaii 148-94-23A-1H**: NW¼ NE¼ of Section 23, T148N, R94W, Dunn County
- **Maui 148-94-23A-4H TF**: NW¼ NE¼ of Section 23, T148N, R94W, Dunn County
- **Kona 148-94-23B-3H**: NE¼ NW¼ of Section 23, T148N, R94W, Dunn County
- **Hilo 148-94-23B-2H TF**: NE¼ NW¼ of Section 23, T148N, R94W, Dunn County

New access roads with utility corridors would be constructed to facilitate the construction and operation of each proposed well. Well pads would be constructed to accommodate drilling activities and well operations. Pits constructed for drilled cuttings would 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 (i.e., roads, well pads, supporting facilities) would 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 would require additional National Environmental Policy Act of 1969 (NEPA) analysis and federal actions.

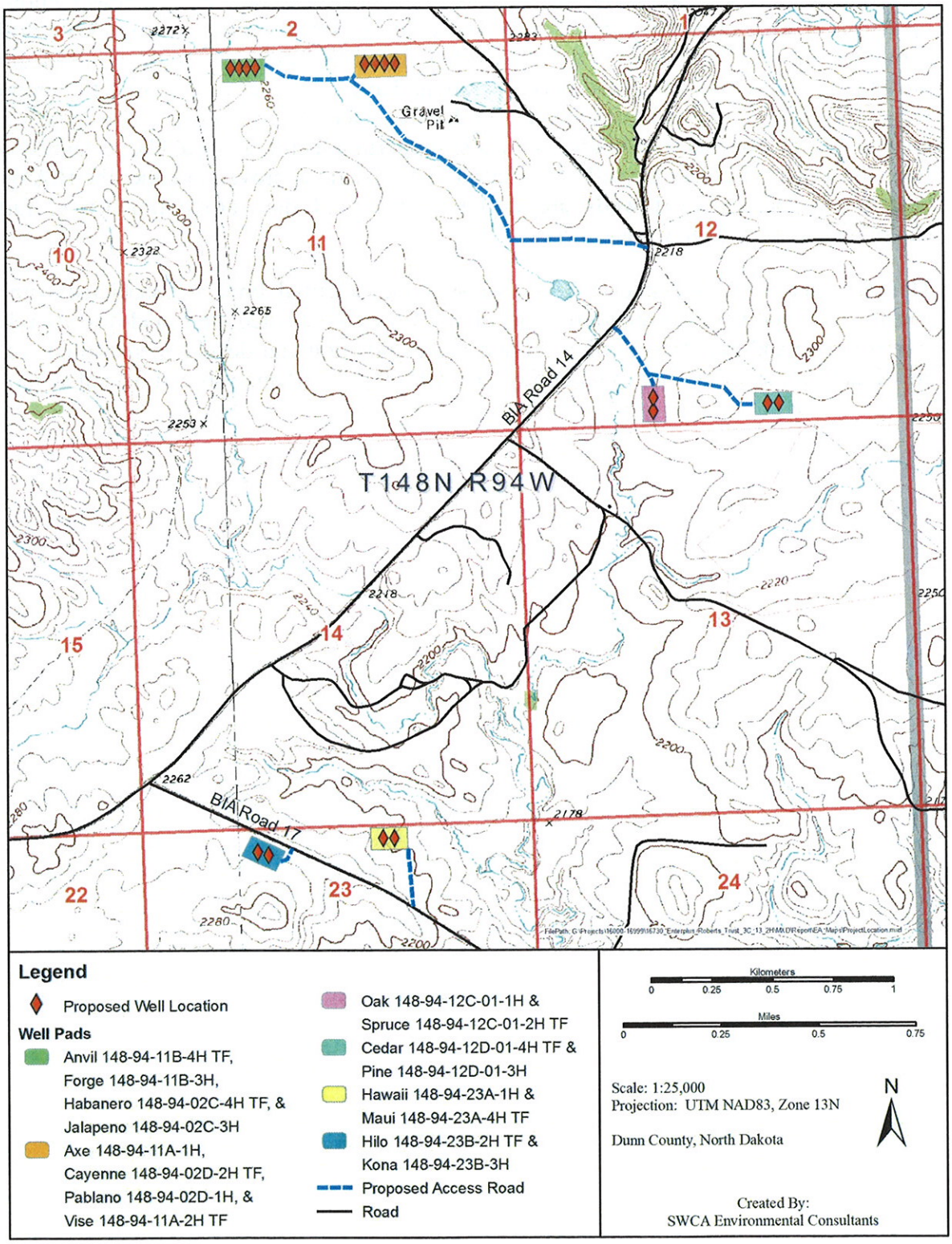


Figure 1.1. Project location.

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, would benefit substantially 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 NEPA, the Council on Environmental Quality (CEQ) regulations (Title 40 Code of Federal Regulations [CFR] 1500–1508), 43 CFR 3100, and Onshore Oil and Gas Order Nos. 1, 2, 6, and 7 is 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 would describe potential impacts to the project area. This EA analyzes potential impacts to elements in the natural and human environment 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. The EA also analyzes the potential for cumulative impacts and ultimately makes a determination as to the significance of any impacts.

This EA would result in either a Finding of No Significant Impact (FONSI) or, should significant adverse impacts be identified as a result of the direct, indirect, or cumulative effects of the Proposed Action, then the NEPA requires the preparation of an environmental impact statement (EIS). In the absence of significant negative consequences, it should be noted that a significant benefit from the project does *not* require preparation of an 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.

Enerplus would 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 the 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 and utility corridors, 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 alternative 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 resulting from the discovery of resources at these well locations.

2.2 THE PROPOSED ACTION

This document analyzes the potential impacts of 16 exploratory oil and gas wells on six pad locations with varied surface and mineral estates located in the west-central portions of the Reservation in Dunn County. Sites were chosen by Enerplus 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 and natural (i.e., biological and physical) resources. The proposed wells would test the commercial potential of the Bakken and Three Forks formations. The EA on-site meeting for the well site locations and proposed access roads was conducted August 24 and 25, 2010. The on-site meeting was attended by the surveyor, natural and cultural resource specialists, Enerplus representatives, the BIA representative, and the Tribal Historic Preservation Office (THPO) monitors. Surveys were conducted at that time to determine potential impacts to resources; topography, potential drainage issues, erosion control measures, and pad and related facility locations (topsoil/subsoil stockpiles, cuttings pits, tanks, etc.) were also discussed at the on-site and the location was finalized. Five cultural resources (one isolated find [32DUX828], and four sites [32DU1545, 32DU1546, 32DU1547, and 32DU1548]) were identified during the inventory (Fewings, Kohler, and Cooper 2010a–d). All of the sites are prehistoric in age and were left unevaluated pending Native American consultation to determine if they are traditional cultural properties. The isolated find is also prehistoric, but not eligible for listing on the National Register of Historic Places and not afforded protective or avoidance measures. All of the sites will be fenced, and a qualified archaeological monitor will be present during construction to ensure that inadvertent impacts to the sites are avoided.

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 and Utility Corridors

Proposed access roads would be constructed to connect the well pads and minimize disturbance as much as possible (Figure 1.1). Up to 9,978.61 feet (1.88 miles) of new access roads would be constructed. A maximum disturbed ROW width of 100 feet would apply for access roads associated with the two well pads in Section 12. This would result in up to 5.84 acres of new surface disturbance. A maximum disturbed ROW width of 100 feet would also apply for 1,320.39 feet of the 6,336.02 total feet of access roads in Section 11, which would result in approximately 3.02 acres of new surface disturbance. All remaining access roads would consist of a maximum disturbed ROW width of 60 feet resulting in up to 8.4 acres of new surface disturbance. Approximately 17.26 total acres of new surface disturbance would result from the proposed project. All proposed access roads would have cattle guards installed at the entrance to access spurs and pads. 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, either along BIA Roads 14 and 17 or in the vicinity of new road construction. The access roads would be surfaced with a minimum of 4 inches of aggregate prior to commencement of drilling operations and would remain in use for the life of the wells. Details of road construction are addressed in the APD. A diagram of typical road cross sections is provided as Figure 2.1.

Enerplus also proposes to construct and install oil, gas, and water gathering pipelines along the proposed access roads from the well pads to the existing improved roads that provide access, including BIA 14 and 17, or directly to trunk lines in the area. A buried electric line would be installed in the future. The utility corridor would be part of the proposed ROW and no additional disturbance is anticipated.

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 cuttings. The pads 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 two-well pads average approximately 300 by 500 feet in size. The four-well pad in the NENW Section 11 would be approximately 300 by 575 feet, and the four-well pad in the NWNE would be approximately 300 by 700 feet in size. Cut-and-fill slopes, stockpiled topsoil, and cuttings pit backfill placed on the edge of the pads would result in additional surface disturbance per pad. Total surface disturbance would total approximately 25.83 acres. All proposed pads would have a 2:1 slope on cut ends. Details of pad construction and reclamation can be found in the APD.

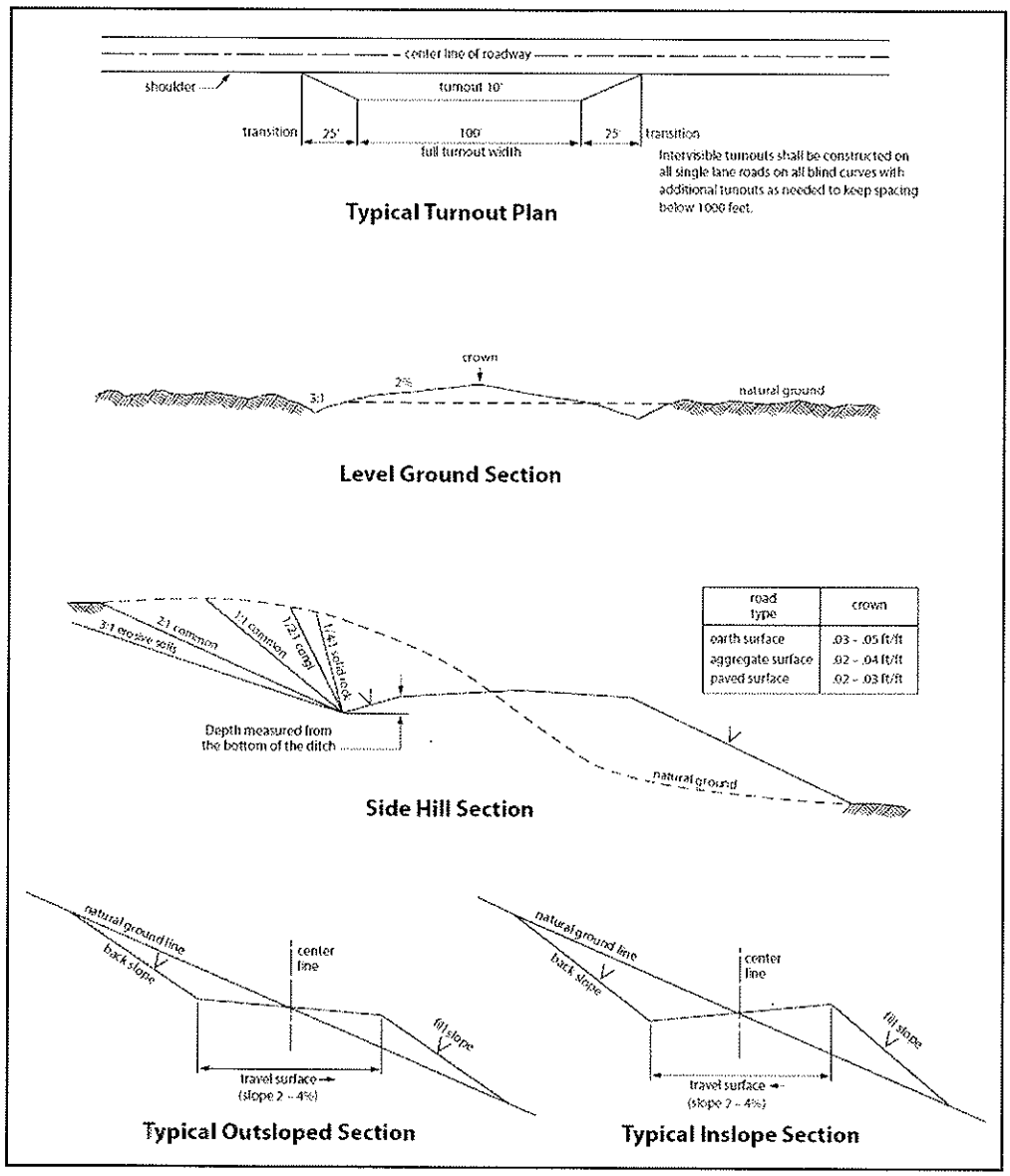


Figure 2.1. Typical road cross sections (BLM and USFS 2007).

2.2.4 Drilling

After securing mineral leases, Enerplus submitted the Notices of Staking to the BLM on October 18, 2010, and the ROW on-site meeting was conducted on November 18, 2010. Copies of APDs submitted to the BLM North Dakota Field Office are sent to the BIA's office in New Town, North Dakota. Construction would begin only when the BIA completes the NEPA process and the APDs are subsequently approved by the BLM.

Enerplus uses a semi-closed loop drilling system. Rig transport and on-site assembly would take roughly seven days for each well; a typical drill rig is shown in Figure 2.2. Drilling would require approximately 30 days to reach target depth, using a rotary drilling rig rated for drilling to approximately 20,000 feet. For the first 2,000 feet drilled, a freshwater-based mud system (1.26 gallons per foot of hole drilled) with non-hazardous additives would be used to minimize contaminant concerns. Water would be obtained from a commercial source for this drilling stage.

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 at approximately 11,100 feet, depending on the formation targeted. Oil-based drilling fluids reduce the potential for hole sloughing while drilling through water-sensitive formations (shales/salts). Approximately 3,400 gallons of salt water and 13,400 gallons of diesel fuel per well would be used to complete vertical drilling. The lateral reach of the borehole would be drilled using approximately 63,000 gallons of salt water as mud and adding polymer sweeps as necessary to clean the hole.

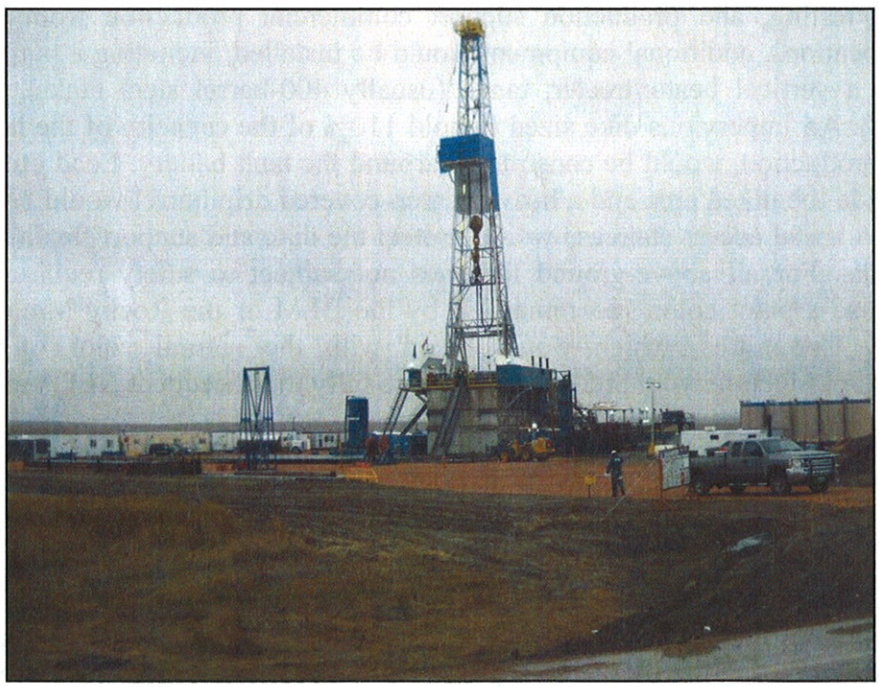


Figure 2.2. Typical drilling rig.

2.2.5 Casing and Cementing

Surface casing would be set at an approximate depth of 2,200 to 2, 400 feet, depending on the targeted formation, 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 1,600 to 2,200 feet. Intermediate casing would be cemented from approximately 11,100 feet (TMD) deep to a depth of about 4,700 to 4,800 feet in order to isolate the hydrocarbon zone present in the Dakota Formation below at an average depth of 5,300 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 and Evaluation

A completion rig unit would be moved on site following the conclusion of drilling and casing activities. Approximately 30 days are 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 six 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 2.3). An impervious dike sized to hold 110% of the capacity of the largest tank, plus one day's production, would be constructed around the tank battery. 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.

Oil would be collected in tanks installed on location 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 180 barrels of oil per day and 40 barrels of water during the first year of production. After the first year, the operator estimates production would decrease to approximately 40 to 60 barrels of oil per day and 10 to 15 barrels of water. Produced water is mostly recovered frac fluids and is expected to become minimal after two years.

Figure 2.3. 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).

In the future, the operator may apply for ROWs for oil and water pipelines and for an electric line, all of which would likely be located within existing disturbance along access and arterial roads. For purposes of this EA, a survey corridor was sized to accommodate the full utility corridor, including the access road and future pipelines and electric line.

2.2.8 Construction Details at Individual Sites

2.2.8.1 NWNE Section 11: Axe 148-94-11A-1H, Poblano 148-94-02D-1H, Vise 148-94-11A-2H TF, Cayenne 148-94-02D-2H TF

This proposed four-well site, seen in Figure 2.4, is located approximately 5.6 miles southeast of Mandaree in the NW¼ NE¼ of Section 11, T148N, R94W in Dunn County, North Dakota. A new access road approximately 5,113 feet long would be constructed to connect to BIA Road 14 to the south (Figure 2.5). Approximately 97 feet of the access road would be expanded to 100 feet to allow for the installation of the future gathering and buried electric lines. The new road would disturb approximately 7.12 acres; the proposed well pad would disturb approximately 4.92 acres (including backfill), bringing the total anticipated new disturbance to 12.04 acres. The BIA will require a monitor during construction of the access road to avoid a possible Traditional Cultural Property (TCP). Please see Section 3.9, Mitigation and Monitoring, for more information regarding BMPs and other protection measures.

Figure 2.4. NWNE Section 11 well pad area, looking south.

Figure 2.5. NWNE Section 11 well site access road, looking west toward well pad location.

2.2.8.1.1 Axe 148-94-11A-1H

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the SW¼ SE¼ of Section 11, T148N, R94W (Figure 2.6). Vertical drilling would be completed at approximately 10,300 feet, at which point drilling would turn roughly horizontal to an approximate total vertical depth (TVD) of 10,751 feet. The drill string would total approximately 15,466 feet at the total measured depth (TMD), including approximately 4,715

feet of lateral reach into the Middle Bakken member. The drilling target is approximately 250 feet from the south line and 550 feet from the east line, about 4,881 feet southeast of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.1.2 Poblano 148-94-02D-1H

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located in the NW¼ NE¼ of Section 2, T148N, R94W (Figure 2.6). Vertical drilling would be completed at approximately 10,300 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,766 feet. The drill string would total approximately 15,992 feet at the TMD, including approximately 4,961 feet of lateral reach into the Middle Bakken member. The drilling target is approximately 250 feet from the north line and 550 feet from the east line, about 5,018 feet northeast of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.1.3 Vise 148-94-11A-2H TF

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the SW¼ SE¼ of Section 11, T148N, R94W (Figure 2.6). Vertical drilling would be completed at approximately 10,300 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,843 feet. The drill string would total approximately 15,180 feet at the TMD, including approximately 4,337 feet of lateral reach into the Three Forks member. The drilling target is approximately 250 feet from the south line and 1,940 feet from the east line, about 4,784 feet southwest of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.1.4 Cayenne 148-94-02D-2H TF

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located in the NE¼ NE¼ of Section 2, T148N, R94W (Figure 2.6). Vertical drilling would be completed at approximately 10,365 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,842 feet. The drill string would total approximately 15,567 feet at the TMD, including approximately 4,452 feet of lateral reach into the Middle Bakken member. The drilling target is approximately 250 feet from the north line and 1,940 feet from the east line, about 4,898 feet northwest of the surface hole location. A setback of at least 200 feet would be maintained.

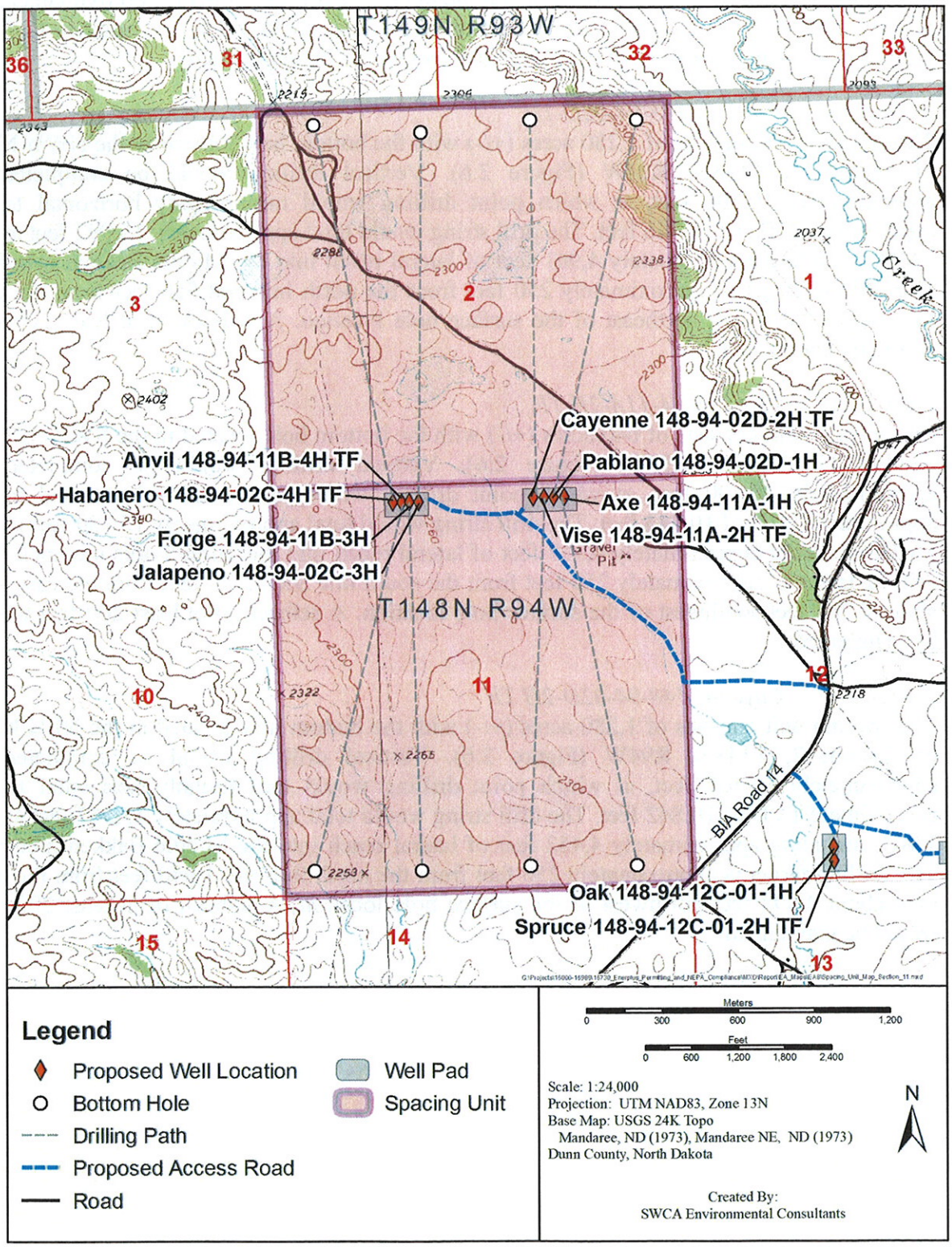


Figure 2.6. 640-acre spacing units in Sections 2 and 11 and respective drilling targets of the proposed wells.

2.2.8.2 NENW Section 11: Habanero 148-94-02C-4H TF, Anvil 148-94-11B-4H TF, Forge 148-94-11B-3H, Jalapeno 148-94-02C-3H

This proposed four-well site, seen in Figure 2.7, is located approximately 5.5 miles southeast of Mandaree in the NE¼ NW¼ of Section 11, T148N, R94W in Dunn County, North Dakota. A new access road approximately 1,223.17 feet long would be constructed to connect to the proposed access road in the NWNE of Section 11 (Figure 2.8). The new road would have a ROW width of 100 feet and would disturb approximately 2.8 acres; the proposed well pad would disturb approximately 4.06 acres (including backfill), bringing the total anticipated new disturbance to 6.86 acres. The BIA would require the following site-specific protection measures at the well site:

- A drainage ditch would be constructed on the south side of the pad to divert runoff.
- Shrubs removed from the site would be ground and mixed into the salvaged topsoil.
- The site would be mowed or an avian survey would be conducted prior to construction.
- Erosion-control BMPs would be installed on the fill side of the pad.

Please see Section 3.9, Mitigation and Monitoring, for more information regarding BMPs and other protection measures.

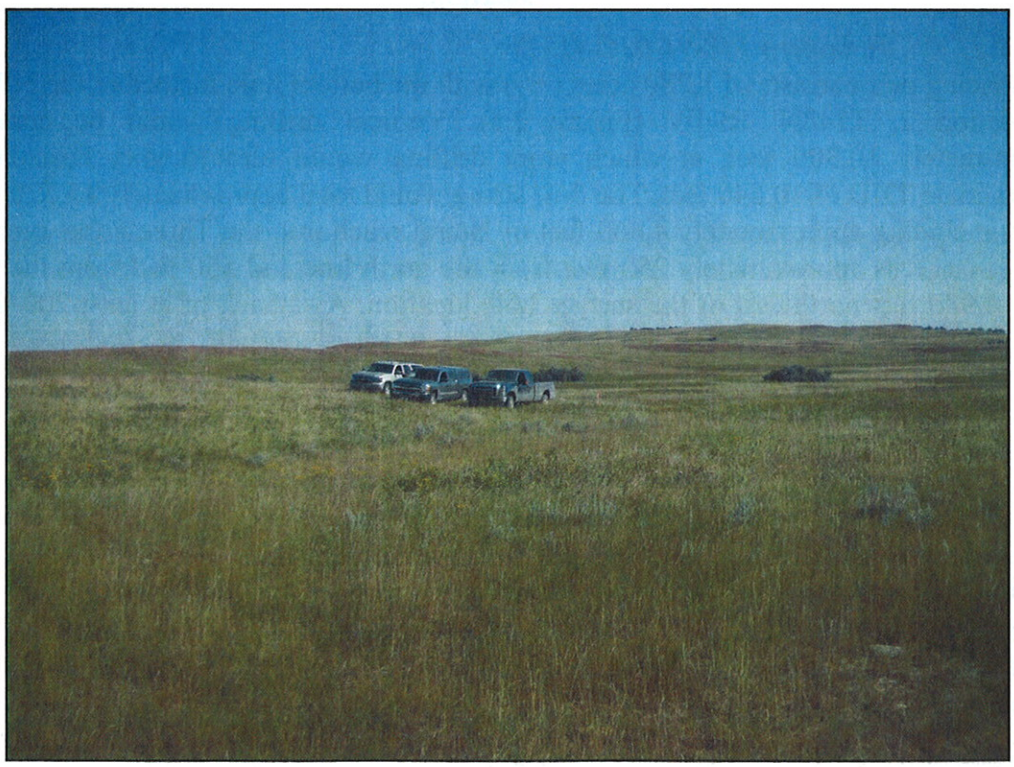


Figure 2.7. NENW Section 11 well pad area, looking north.

Figure 2.8. NENW Section 11 well site access road, looking west toward well pad location.

2.2.8.2.1 Habanero 148-94-02C-4H TF

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located in the NW¼ NW¼ of Section 2, T148N, R94W (Figure 2.6). Vertical drilling would be completed at approximately 10,300 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,840 feet. The drill string would total approximately 15,570 feet at the TMD, including approximately 4,460 feet of lateral reach into the Three Forks member. The drilling target is approximately 250 feet from the north line and 550 feet from the west line, about 4,980 feet northwest of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.2.2 Anvil 148-94-11B-4H TF

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the SW¼ SW¼ of Section 11, T148N, R94W (Figure 2.6). Vertical drilling would be completed at approximately 10,300 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,840 feet. The drill string would total approximately 15,200 feet at the TMD, including approximately 4,340 feet of lateral reach into the Three Forks member. The drilling target is approximately 250 feet from the south line and 550 feet from the west line, about 4,883 feet southwest of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.2.3 Forge 148-94-11B-3H

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the SE¼ SW¼ of Section 11, T148N, R94W (Figure 2.6). Vertical drilling would be completed at approximately 10,300 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,750 feet. The drill string would total approximately 15,470 feet at the TMD, including approximately 4,720 feet of lateral reach into the Middle Bakken member. The drilling target is approximately 250 feet from the south line and 1,940 feet from the west line, about 4,788 feet southeast of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.2.4 Jalapeno 148-94-02C-3H

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located in the NE¼ NW¼ of Section 2, T148N, R94W (Figure 2.6). Vertical drilling would be completed at approximately 10,300 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,770 feet. The drill string would total approximately 15,990 feet at the TMD, including approximately 4,970 feet of lateral reach into the Middle Bakken member. The drilling target is approximately 250 feet from the north line and 1,940 feet from the west line, about 4,802 feet northeast of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.3 SESW Section 12: Spruce 148-94-12C-01-2H TF and Oak 148-94-12C-01-1H

This proposed dual-well site, seen in Figure 2.9, is located approximately 6.7 miles southeast of Mandaree in the SE¼ SW¼ of Section 12, T148N, R94W in Dunn County, North Dakota. A new access road approximately 970.52 feet long would be constructed to connect to BIA Road 14 to the northwest (Figure 2.10). The new road would have a ROW width of 100 feet and would disturb approximately 2.22 acres; the proposed well pad would disturb approximately 3.54 acres (including backfill), bringing the total anticipated new disturbance to 5.76 acres. During the on-site meeting, the pad was shifted approximately 90 degrees to avoid an intermittent stream in the area. The BIA would require the following site-specific protection measures at the well site:

- Install matting on and hydroseed the cut side of the pad.
- Construct 2-foot berm around the pad.
- Maintain 200-foot buffer from edge of pad to drainage.
- Use appropriate BMPs to prevent impacts to the intermittent stream to the west.
- If the location is not built during the fall months, the site would be mowed or an avian survey would be conducted to minimize effects to migratory birds.

Please see Section 3.9, Mitigation and Monitoring, for more information regarding BMPs and other protection measures.

Figure 2.9. SESW Section 12 well pad area, looking north.

Figure 2.10. SESW Section 12 well site access road, looking south from well pad location.

2.2.8.3.1 Spruce 148-94-12C-01-2H TF

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located in the NW¼ NW¼ of Section 1, T148N, R94W (Figure 2.11). Vertical drilling would be completed at approximately 10,333 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,821 feet. The drill string would total approximately 20,534 feet at the TMD, including approximately 9,713 feet of lateral reach into the Three Forks member. The drilling target is approximately 250 feet from the north line and 550 feet from the west line, about 9,662 feet northwest of the surface hole location. A setback of at least 200 feet would be maintained.

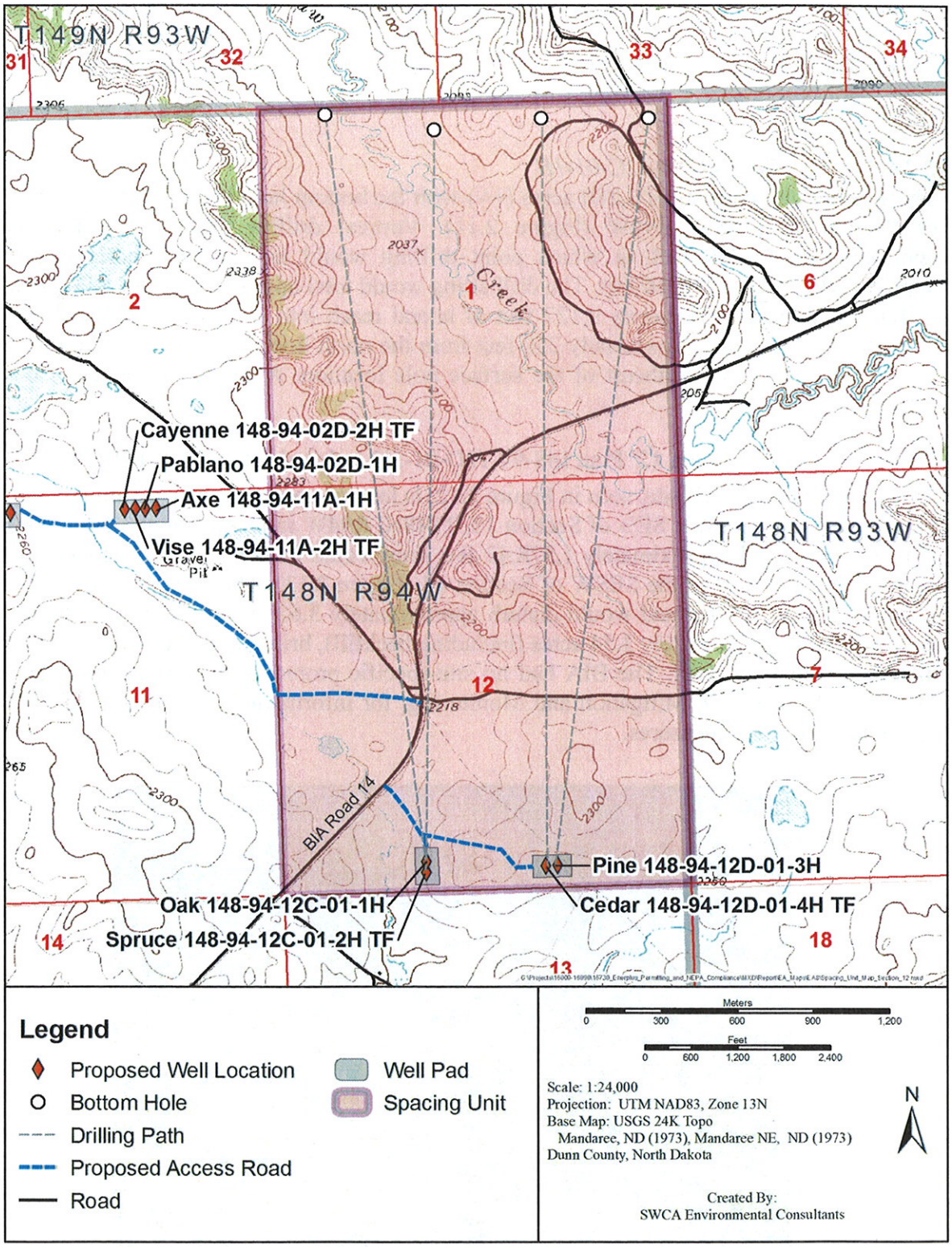


Figure 2.11. 1,280-acre spacing units covering Sections 1 and 12 and respective drilling targets of the proposed wells.

The BIA would require the following site-specific protection measures at the well site:

- The site would be mowed or an avian survey would be conducted prior to construction.

2.2.8.3.2 Oak 148-94-12C-01-1H

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located in the NE¼ NW¼ of Section 1, T148N, R94W (Figure 2.11). Vertical drilling would be completed at approximately 10,259 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,736 feet. The drill string would total approximately 19,863 feet at the TMD, including approximately 9,127 feet of lateral reach into the Middle Bakken member. The drilling target is approximately 250 feet from the north line and 1,940 feet from the west line, about 9,675 feet northeast of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.4 SWSE Section 12: Pine 148-94-12D-01-3H and Cedar 148-94-12D-01-4H TF

This proposed dual-well site, seen in Figure 2.12, is located approximately 6.8 miles southeast of Mandaree in the SW¼ SE¼ of Section 12, T148N, R94W in Dunn County, North Dakota. A new access road approximately 1,578.42 feet long would be constructed to connect to the proposed access road in the SESW of Section 12 (Figure 2.13). The new road would have a ROW width of 100 feet and would disturb approximately 3.62 acres; the proposed well pad would disturb approximately 3.54 acres (including backfill), bringing the total anticipated new disturbance to 7.06 acres. The BIA had no site-specific protection requirements at this site. Please see Section 3.9, Mitigation and Monitoring, for information regarding general BMPs and other protection measures.

Figure 2.12. SWSE Section 12 well pad area, looking north.

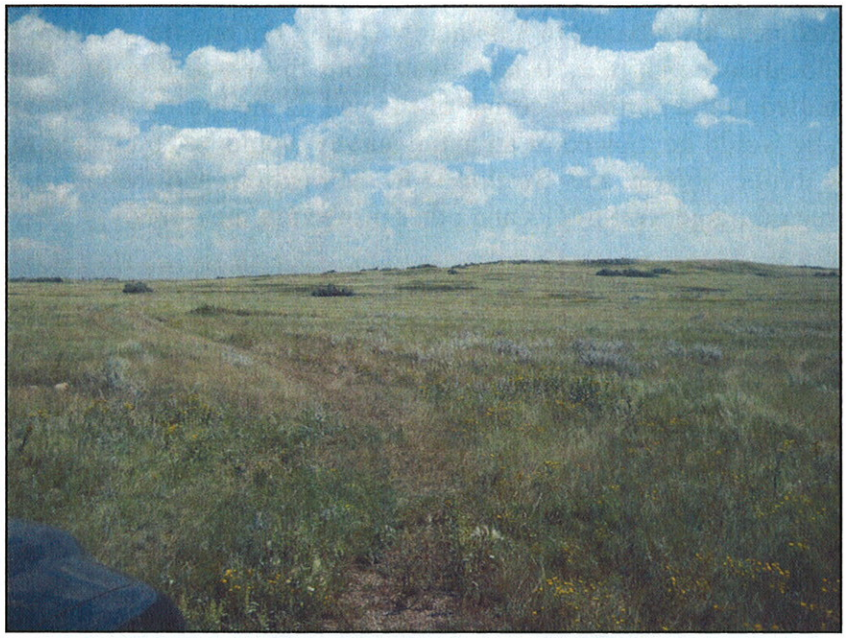


Figure 2.13. SWSE Section 12 well site access road, looking west toward well pad location.

2.2.8.4.1 Pine 148-94-12D-01-3H

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located in the NW¼ NE¼ of Section 1, T148N, R94W (Figure 2.11). Vertical drilling would be completed at approximately 10,286 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,736 feet. The drill string would total approximately 15,630 feet at the TMD, including approximately 9,772 feet of lateral reach into the Middle Bakken member. The drilling target is approximately 250 feet from the north line and 550 feet from the east line, about 9,772 feet northwest of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.4.2 Cedar 148-94-12D-01-4H TF

The spacing unit consists of 1,280 acres (+/-) with the bottom hole located in the NE¼ NE¼ of Section 1, T148N, R94W (Figure 2.11). Vertical drilling would be completed at approximately 10,335 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,812 feet. The drill string would total approximately 20,284 feet at the TMD, including approximately 9,199 feet of lateral reach into the Three Forks member. The drilling target is approximately 250 feet from the north line and 1,940 feet from the east line, about 9,675 feet northwest of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.5 NENW Section 23: Hilo 148-94-23B-2H TF and Kona 148-94-23B-3H

This proposed dual-well site, seen in Figure 2.14, is located approximately 7.2 miles southeast of Mandaree in the NE¼ NW¼ of Section 23, T148N, R94W in Dunn County, North Dakota. A new access road approximately 256 feet long would be constructed to connect to BIA Road 17 to the north (Figure 2.15). The new road would disturb approximately 0.35 acre; the proposed well pad would disturb approximately 3.54 acres (including backfill), bringing the

total anticipated new disturbance to 3.89 acres. During the on-site meeting, the BIA requested that the pad location be shifted 10 feet away from the fence line and that the tank battery would be installed in the northeast corner of the pad. If the location is not built during the fall months, the site would be mowed or an avian survey would be conducted to minimize effects to migratory birds. Please see Section 3.9, Mitigation and Monitoring, for additional information regarding general BMPs and other protection measures.

Figure 2.14. NENW Section 23 well pad area, looking east toward BIA 17.

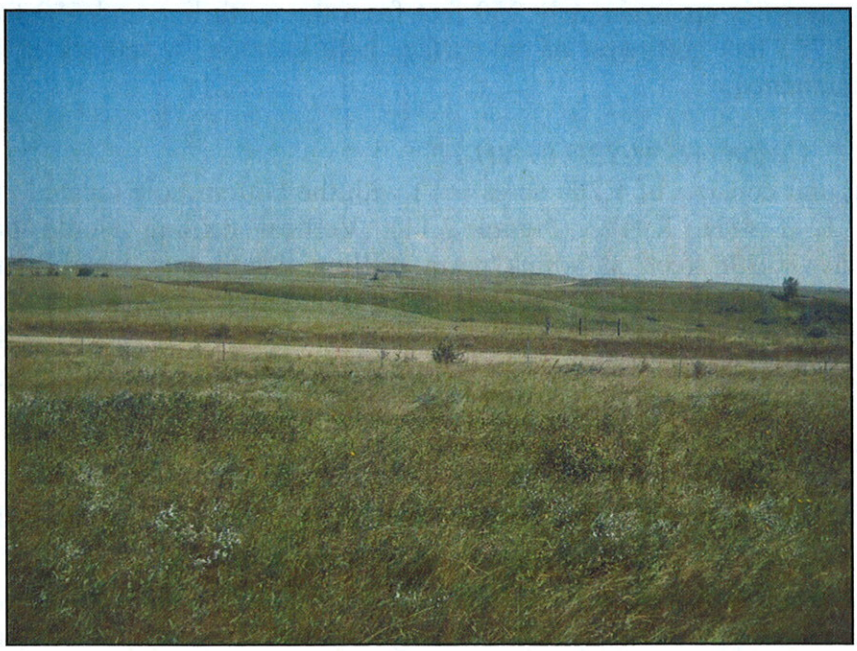


Figure 2.15. NENW Section 23 well site access road, looking east toward intersection with BIA 17.

2.2.8.5.1 Hilo 148-94-23B-2H TF

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the SE¼ SW¼ of Section 23, T148N, R94W (Figure 2.16). Vertical drilling would be completed at approximately 10,357 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,825 feet. The drill string would total approximately 15,807 feet at the TMD, including approximately 4,715 feet of lateral reach into the Three Forks member. The drilling target is approximately 250 feet from the south line and 550 feet from the west line, about 4,826 feet southwest of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.5.2 Kona 148-94-23B-3H

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the SE¼ SW¼ of Section 23, T148N, R94W (Figure 2.16). Vertical drilling would be completed at approximately 10,274 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,751 feet. The drill string would total approximately 15,224 feet at the TMD, including approximately 4,200 feet of lateral reach into the Middle Bakken member. The drilling target is approximately 250 feet from the south line and 1,940 feet from the west line, about 4,678 feet southeast of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.6 NWNE Section 23: Hawaii 148-94-23A-1H and Maui 148-94-23A-4H TF

This proposed dual-well site, seen in Figure 2.17 is located approximately 7.3 miles southeast of Mandaree in the NW¼ NE¼ of Section 23, T148N, R94W in Dunn County, North Dakota. A new access road approximately 780 feet long would be constructed to connect to BIA Road 17 to the south (Figure 2.18). The new road would disturb approximately 1.07 acres; the proposed well pad would disturb approximately 3.54 acres (including backfill), bringing the total anticipated new disturbance to 4.61 acres. During the on-site meeting, the pad was shifted 70 feet north and 150 feet west and the access road was shifted to the west to avoid a potential TCP in the area. The BIA would require the following site-specific protection measures at the well site:

- Install matting on the cut and fill sides of the pad.
- Construct 2-foot berm on the east and south sides of the pad.
- Construct drainage ditches on the north, south, and west sides of the pad.
- Construct a drive-on ramp for the pad.
- Provide a cultural resources monitor during construction.
- If the location is not built during the fall months, the site would be mowed or an avian survey would be conducted to minimize effects to migratory birds.

Please see Section 3.9, Mitigation and Monitoring, for more information regarding BMPs and other protection measures.

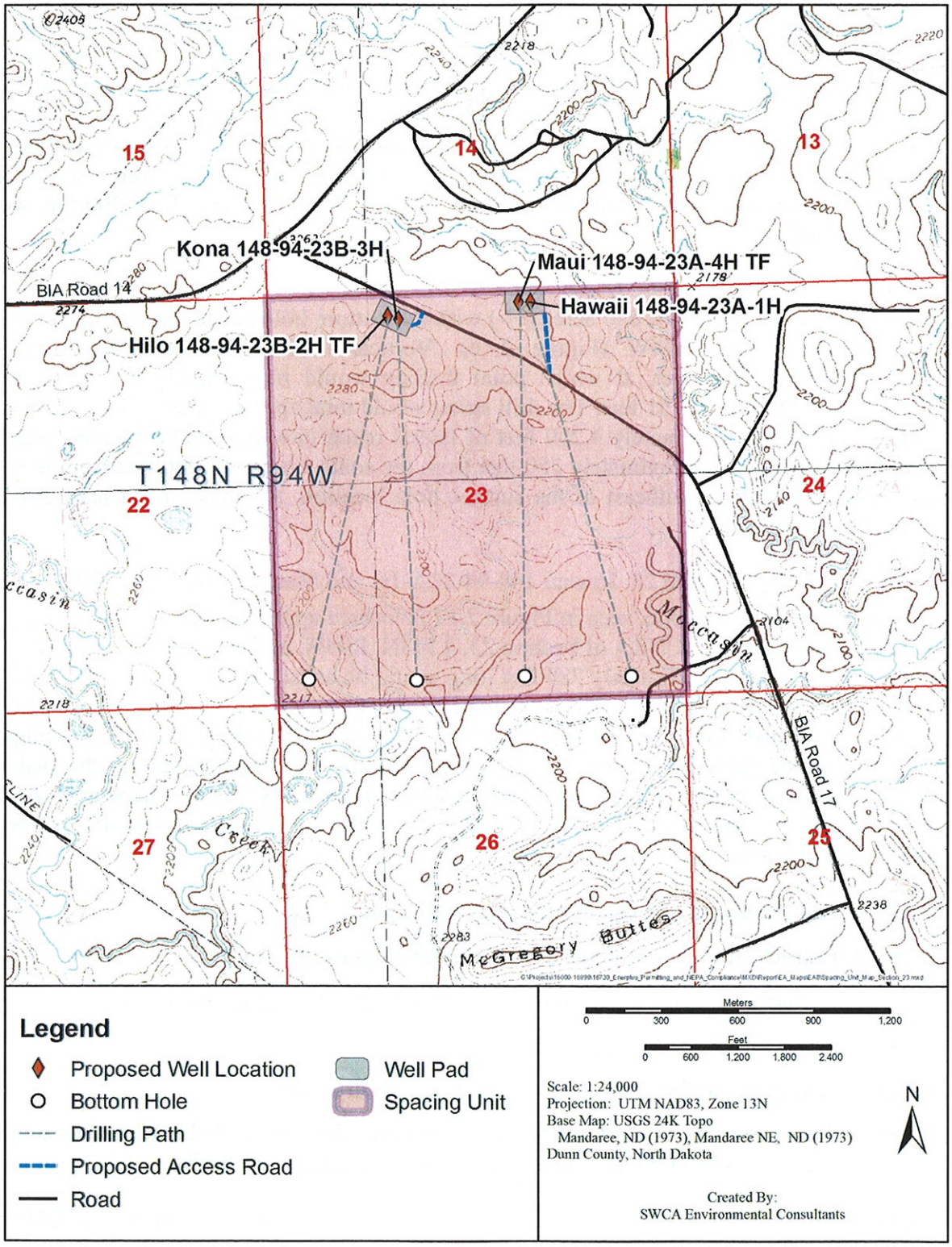


Figure 2.16. 640-acre spacing units in Section 23 and drilling targets of the proposed wells.

Figure 2.17. NENW Section 23 well pad area, looking east toward BIA 17.

Figure 2.18. NENW Section 23 well site access road, looking east toward intersection with BIA 17.

2.2.8.6.1 Hawaii 148-94-23A-1H

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the SE¼ SE¼ of Section 23, T148N, R94W (Figure 2.16). Vertical drilling would be completed at approximately 10,209 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,686 feet. The drill string would total approximately 16,008 feet at the

TMD, including approximately 5,049 feet of lateral reach into the Middle Bakken member. The drilling target is approximately 250 feet from the south line and 550 feet from the east line, about 5,030 feet southeast of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.8.6.2 Maui 148-94-23A-4H TF

The spacing unit consists of 640 acres (+/-) with the bottom hole located in the SW¼ SW¼ of Section 23, T148N, R94W (Figure 2.16). Vertical drilling would be completed at approximately 10,286 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,763 feet. The drill string would total approximately 15,434 feet at the TMD, including approximately 5,148 feet of lateral reach into the Three Forks member. The drilling target is approximately 250 feet from the south line and 1,940 feet from the east line, about 4,846 feet southeast of the surface hole location. A setback of at least 200 feet would be maintained.

2.2.9 Reclamation

2.2.9.1 Interim Reclamation

Interim reclamation would consist of reclaiming all areas not needed for production operations for the life of a well. Immediately after well completion, all equipment and materials unnecessary for production operations would be removed from a location and surrounding area. The cuttings pit drill contents 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 cuttings pit, and overlain by at least 4 feet of overburden as required by adopted NDIC regulations. The surface above the cuttings pit would be seeded to re-establish native/desired vegetation. Topsoil would be spread along the cut and fill slopes of a road.

If commercial production equipment is installed, the well pads would be reduced in size by approximately 20% (four-well pads) and 35% (two-well pads); the portion of the well pads not needed for production would be recontoured, covered with 6 inches of topsoil, and reseeded using methods and seed mixtures determined by the BIA.

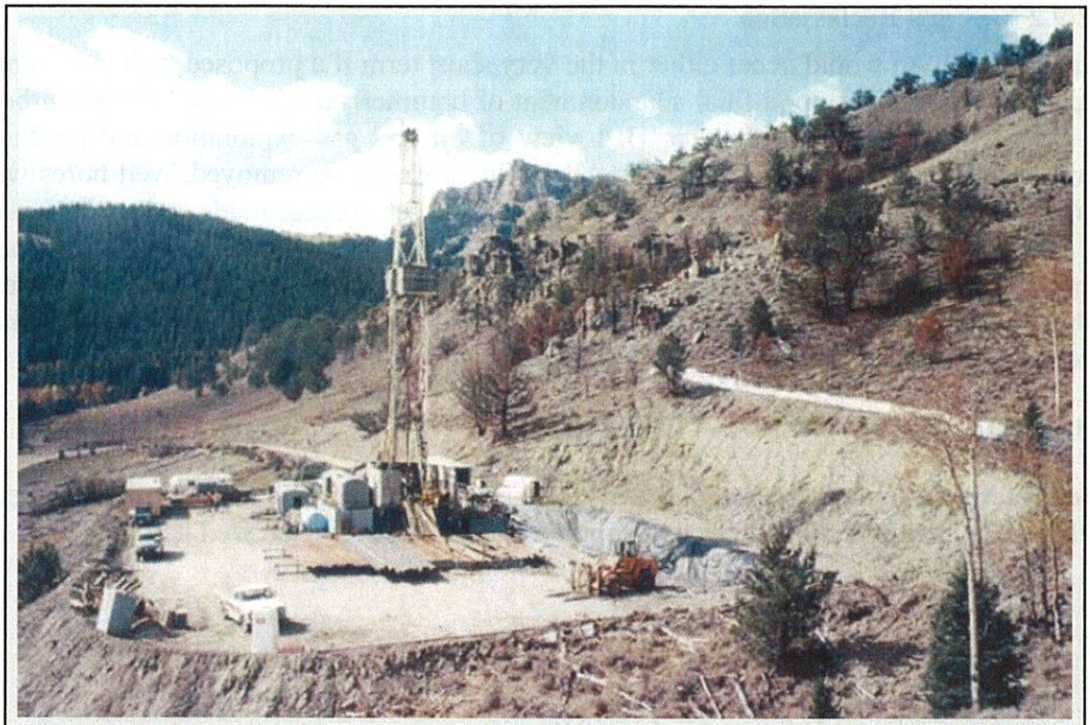
The working area of each well pad and the running surface of access roads would be surfaced with scoria or crushed rock obtained from a previously approved location. The outslope portions of roads would be covered with stockpiled topsoil and reseeded with a seed mixture determined by the BIA, reducing the residual access-related disturbance to a width of approximately 28 feet. Enerplus would control noxious weeds within the ROW, well pads, or other applicable facilities by approved chemical or mechanical methods.

2.2.9.2 Final Reclamation

Final reclamation would occur either in the very short term if a 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 2.19 shows an example of reclamation (BLM and USFS 2007).

2.3 BIA-PREFERRED ALTERNATIVE

The preferred alternative is to complete all administrative actions and approvals necessary to authorize or facilitate oil and gas developments at the six proposed well pad 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 2.19. Example of reclamation from the BLM Gold Book (BLM and USFS 2007).

3.0 THE AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

The broad definition of NEPA leads to the consideration of the following elements of the human and natural environment: 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.

3.1 PHYSICAL SETTING

The proposed well sites and spacing units are in a rural area located on the Reservation in west-central North Dakota. All six well pad sites are located in active pasturelands. Two residential structures lie within 1 mile of the project area. The Reservation is the home of the Three Affiliated Tribes of the MHA Nation. The Reservation encompasses more than one million acres, of which almost half, including the project area, are held in trust by the United States for either the MHA Nation or individual allottees. The proposed wells and access roads are situated geologically within 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 within 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 over 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).

3.2 AIR QUALITY

3.2.1 Air Quality Standards and Criteria Pollutants

The federal Clean Air Act (CAA) (USC § 7401–7671, as amended in 1990) established national ambient air quality standards (NAAQS) for criteria pollutants to protect public health and welfare. It also set standards for other compounds that can cause cancer, regulated emissions that cause acid rain, and required federal permits for large sources. NAAQS have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead (U.S. Environmental Protection Agency [EPA] 2010a). The primary NAAQS are 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.'

The CAA mandates prevention of significant air quality deterioration in certain designated attainment areas and has designated more stringent air quality standards, known as Secondary Standards, for these 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 (Ross 1990). The Class I regulations (40 CFR 51.307) attempt to protect visibility through a review of major new and modified sources of pollutants, and requiring strict air quality emission standards if they will have an adverse impact on visibility within the Class I area (National Park Service [NPS] 2010).

The nearest designated attainment area to the project area is the Theodore Roosevelt National Park (TRNP), a Class I area that covers about 110 square miles in three units within the Little Missouri National Grassland. The TRNP is located approximately 16 miles south of Watford City, North Dakota, and approximately 40 miles west of the proposed well sites. Two air quality monitoring stations are located within the TRNP, with the North Unit monitoring most criteria pollutants (NPS 2010; North Dakota Department of Health [NDDH] 2010). All other parts of the state, including the Reservation, are classified as Class II attainment areas, affording them protections through the Primary NAAQS (NDDH 2010).

Some states have adopted more stringent standards for criteria pollutants, or have chosen to adopt new standards for other pollutants. For instance, the NDDH has established a standard for hydrogen sulfide, which can be found in Table 3.1 (NDDH 2010).

Criteria pollutants and their health effects include the following.

Sulfur dioxide (SO_2) is a colorless gas with a strong, suffocating odor. SO_2 is produced by burning coal, fuel oil, and diesel fuel, and 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. SO_2 emissions are also a primary cause of acid rain and plant damage (EPA 2010a).

Inhalable Particulate Matter (PM_{10} and $PM_{2.5}$) is a class of compounds that can lodge deep in the lungs, causing adverse health problems, depending on their size, concentration, and content. Based on extensive health studies, particulate matter is regulated under two classes. PM_{10} is the fraction of total particulate matter 10 microns or smaller, and $PM_{2.5}$ is two and a half microns or smaller. Inhalable 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 (EPA 2010a).

Nitrogen dioxide (NO_2) is a reddish-brown gas with an irritating odor. Primary sources include motor vehicles, industrial facilities, and power plants. In the summer months, NO_2 is a major component of photochemical smog. NO_2 is an irritating gas that may constrict airways, especially of asthmatics, and increase the susceptibility to infection in the general population. NO_2 is also involved in ozone smog production (EPA 2010a).

Ozone (O_3) 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 (NO_x) 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 (EPA 2010a).

Carbon monoxide (CO) is a colorless, odorless gas that is a byproduct of incomplete combustion. CO 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. CO 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 (EPA 2010a).

The Primary and Secondary NAAQS standards for criteria pollutants are shown in Table 3.1. NEPA assessments require analysis of both near-field and far-field as part of the cumulative effects of proposals on air quality. Therefore, the North Dakota Ambient Air Quality Standards (AAQS) are shown as well federal standards.

Table 3.1. NAAQS and Other Air Quality Standards.

Pollutant	Averaging Period	Primary Standard (NAAQS)	Secondary Standard (National Parks)	North Dakota AAQS
SO_2 in parts per million of air (ppm)	3-hour	-	0.5	0.273 (1-hour)
	24-hour	0.14	-	0.099
	Annual Mean	0.03	-	0.023
PM_{10} in micrograms per cubic meter of air ($\mu g/m^3$)	24-hour	150		150
	Expected Annual Mean	50		50
$PM_{2.5}$ ($\mu g/m^3$)	24-hour	35	35	35
	Weighted Annual Mean	15	15	15
NO_2 (ppm)	Annual Mean	0.053	0.053	0.053
CO (ppm)	8-hour	9	-	9
	1-hour	35	-	35
O_3 (ppm)	8-hour	0.075	0.075	-
	1-hour	-	-	0.12
Lead ($\mu g/m^3$)	3-month Arithmetic Mean within a 3-year period	0.15	0.15 -	1.5 (quarterly mean)

Pollutant	Averaging Period	Primary Standard (NAAQS)	Secondary Standard (National Parks)	North Dakota AAQS
Hydrogen sulfide (H_2S) (ppm)	Instantaneous	-	-	10
	1-hour	-	-	0.20
	24-hour	-	-	0.10
	3-month	-	-	0.02

Sources: EPA 2010a; NDDH 2010.

Note that North Dakota has separate state standards for several pollutants that are different from the federal criteria standards. These are the standards for SO_2 and hydrogen sulfide (H_2S). All other state criteria pollutant standards are the same as federal. North Dakota was one of 13 states that met standards for all federal criteria pollutants in 2008.

In addition, the EPA averages data from monitoring stations within each county to determine the Air Quality Index (AQI), a general measure of air quality for residents of the county. An AQI greater than 100 is indicative of unhealthy air quality conditions for the county residents, although residents may experience greater or lesser risks depending on their proximity to the sources of pollutants (EPA 2010b).

3.2.2 Greenhouse Gas Emissions and Climate Change

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs). Some GHGs such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and human activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The EPA (2010c) identifies the principal GHGs that enter the atmosphere because of human activities as the following:

- **Carbon Dioxide (CO_2)**: Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH_4)**: Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide (N_2O)**: Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Fluorinated Gases**: Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are typically emitted in small quantities, but are potent GHGs thought to contribute significantly to global warming processes (EPA 2010c).

CO_2 is the primary GHG, responsible for approximately 90 percent of radiative forcing (the rate of energy change as measured at the top of the atmosphere; can be positive [warmer] or negative [cooler]) (EPA 2010c). To simplify discussion of the various GHGs, the term 'Equivalent CO_2 or CO_2e' has been developed. CO_2e is the amount of CO_2 that would cause the same level of radiative forcing as a unit of one of the other GHGs. For example, one ton of methane (CH_4) has a CO_2e of 22 tons; therefore, 22 tons of CO_2 would cause the same level of radiative forcing as one ton of CH_4. Nitrous oxide (N_2O) has a CO_2e value of 310. Thus, control strategies often focus on the gases with the highest CO_2e value.

According to the Pew Center, "Over the past 50 years, the (worldwide) data on extreme temperatures have shown similar trends of rising temperatures: cold days, cold nights, and frosts occurred less frequently over time, while hot days, hot nights, and heat waves occurred more frequently" (Pew Center 2009). Generally, the earth's temperature has increased about one degree Celsius since 1850 but some areas have seen an increase of four degrees. Sea levels are also rising, mountain glaciers are disappearing, and ocean currents, such as the Gulf Stream, are slowing (Intergovernmental Panel on Climate Change [IPCC] 2007).

Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases. The IPCC Working Group I Fourth Assessment compiles and analyzes global data on climate change, and reports that warming of the climate system is evident from global observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level (IPCC 2007). Globally, 11 out of the 12 years between 1995 and 2007 ranked among the warmest years in the instrumental record of global surface temperature since 1850 (IPCC 2007).

The temperature increase is widespread over the globe and is greater at higher northern latitudes. Land regions have warmed faster than the oceans. The National Oceanic and Atmospheric Agency (NOAA) monitored data indicates that 21 of the previous 30 years (1979–2009) have had above average temperatures in the contiguous United States, with departures from average temperatures occurring with increasing frequency, as shown in Figure 3.1 (NOAA 2010).

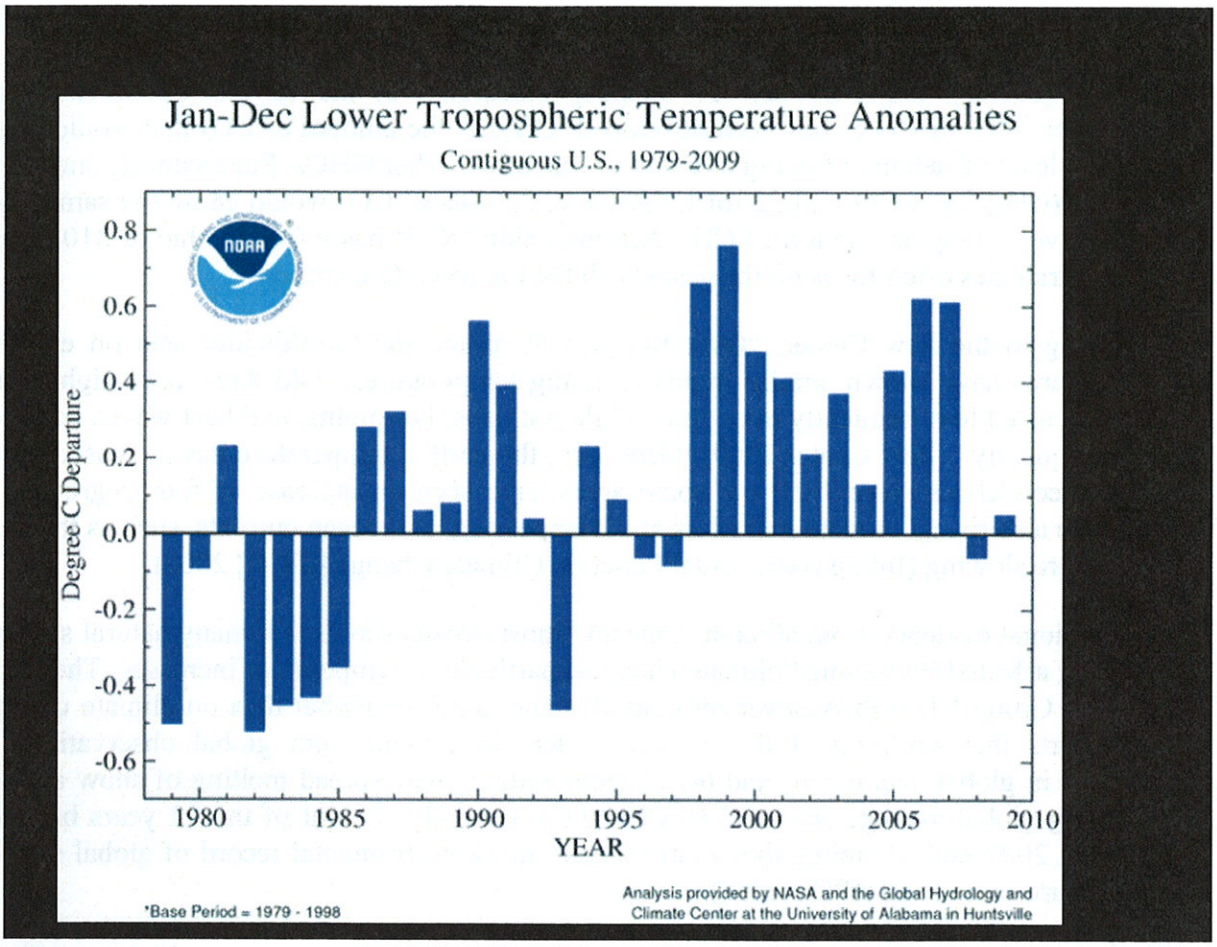


Figure 3.1. January–December lower tropospheric temperature anomalies.

Many physical and biological effects have been observed to correlate with trends in global warming. Sea levels are rising worldwide and along much of the United States coast (EPA 2010c). Tide gauge measurements and satellite altimetry suggest that sea level has risen worldwide approximately 4.8 to 8.8 inches (12–22 centimeters) during the last century (IPCC 2007). A significant amount of sea level rise has likely resulted from the observed warming of the atmosphere and the oceans. Hydrological systems, ice pack, and permafrost are also affected by higher oceanic and atmospheric temperatures, affecting biological systems and agriculture (IPCC 2007).

IPCC experts concluded that most of the observed increase in globally averaged temperature since the mid-twentieth century is very likely due to the observed increase in anthropogenic GHG concentrations (IPCC 2007). Therefore, the EPA collects data on and encourages limiting or reducing emissions of anthropogenic sources of GHGs to the earth's atmosphere (EPA 2010d). Many U.S. states have adopted goals and actions to reduce GHGs. 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 (EPA 2010d).

On May 13, 2010, EPA issued a final rule that establishes thresholds for GHG emissions that define when permits under the New Source Review Prevention of Significant Deterioration (PSD) and title V Operating Permit programs are required for new and existing industrial facilities (EPA 2010d). This final rule "tailors" the requirements of these CAA permitting programs to limit which facilities will be required to obtain PSD and title V permits. Facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities. Emissions from small farms, restaurants, and all but the very largest commercial facilities will not be covered by these programs at this time, however, the EPA recently initiated additional hearings to help determine the types of industries to be held to new standards under these federal permits (EPA 2010d).

Energy production and supply was estimated to emit up to 25.9% of GHGs world-wide in 2004 (Pew Center 2009). Methane gas (CH_4), with a high radiative forcing CO_2e ratio, is a common fugitive gas emission in oil and gas fields (EPA 2010c). Oil and gas production, however, is highly variable in potential GHG emissions. Oil and gas producers in the United States are not considered large GHG emitters by the EPA, and are not the subject of any current federal proposals that would regulate GHG emissions.

3.2.3 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 the emission source. HAPs are regulated separately from criteria air pollutants. There are several hundred HAPs recognized by the EPA and 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 one million persons. The NDDH typically reviews projects and either requires an applicant to prepare a risk assessment or assign the state engineers to do the work. 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 one in one hundred thousand.

3.2.4 Existing Air Quality in the Project Area

Federal air quality standards apply in the project area, which is designated as a Class II attainment area. Although the State of North Dakota does not have jurisdiction over air quality matters on the Reservation and no air quality monitoring stations occur within the boundaries of the Reservation, monitoring efforts are being made by the state and industry in

the area. 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 are subject to quality assurance, and when approved, it is published on the World Wide Web and available from EPA and NDDH.

Monitoring stations providing complete data near the project site include Theodore Roosevelt National Park North Unit (TRNP-NU) (Air Quality Station # 380530002) in McKenzie County, and Dunn Center (Air Quality Station # 38025003) in Dunn County. These stations are located west and southeast of the proposed well sites, respectively. Bear Paw Energy and Amerada Hess operate site-specific monitoring stations in the region. However, these stations do not provide complete data that would be applicable to this analysis (NDDH 2010).

Criteria pollutants measured at the two monitoring stations include SO_2, PM_{10}, NO_2, and ozone. Lead and CO are not monitored by the two stations. Table 3.2 summarizes the NAAQS and the maximum levels of criteria pollutants. The highest value at either of the two monitoring locations is shown for each year from 2007 through 2009.

Table 3.2. Maximum Levels of Monitored Pollutants, 2007–2009, as Measured at Dunn Center and Theodore Roosevelt National Park North Unit Monitoring Stations.

Criteria Pollutant	Averaging Period	Primary Standard (NAAQS)	Maximum Reported Level from Dunn Center and TRNP-NU Monitoring Stations		
			2009	2008	2007
SO_2 in parts per million (ppm)	24-hour	0.14	0.006	0.004	0.004
	Annual Mean	0.03	0.0005	0.0004	0.0011
PM_{10} in micrograms per cubic meter or air ($\mu g/m^3$)	24-hour	150	54	108	57.4
	Expected Annual Mean	50	11.3	14.2	13.2
$PM_{2.5}$ ($\mu g/m^3$)	24-hour	35	15	35.7	22.2
	Weighted Annual Mean	15	3.4	3.7	3.6
NO_2 (ppm)	Annual Mean	0.053	0.0015	0.0018	0.0015
O_3 (ppm)	8-hour	0.08	0.057	0.0063	0.0071

Source: NDDH 2010.

All monitored criteria pollutants are well below federal and state standards measured at the monitoring stations for all years in the study period from 2007 through 2009. In addition to the low levels of monitored criteria pollutants, the EPA reports that Dunn County and McKenzie County had zero days in which the AQI exceeded 100 in 2007 and 2008, indicating that general air quality does not pose an unhealthy condition for residents of these counties (EPA 2010b). The AQI was not available for 2009, but is also believed to be zero.

3.2.5 Typical Project Emissions from Oilfield Development

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

- Combustion emissions include SO_2, ozone precursors called volatile organic compounds (VOCs), GHGs, and HAPs. Sources include engine exhaust, dehydrators, and flaring.
- Fugitive emissions include criteria pollutants, H_2S, VOCs, HAPs, and GHGs. Sources include equipment leaks, evaporation ponds and pits, condensate tanks, storage tanks, and windblown 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 secondly manufacturers must produce progressively lower engine emissions.

3.2.6 Air Quality 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 the following six general categories.

- Transportation BMPs to reduce the amount of fugitive dust and vehicle emissions
  - Use directional drilling to drill multiple wells from a single well pad;
  - use centralized water storage and delivery, well fracturing, gathering systems;
  - use telemetry to remotely monitor and control production;
  - use water or dust suppressants to control fugitive dust on roads;
  - control road speeds; and
  - use van or carpooling.
- Drilling BMPs to reduce rig emissions
  - Use cleaner diesel (Tier 2, 3, and 4) engines;
  - use natural gas-powered engines; and
  - use "green" completions to recapture product that otherwise would have been vented or flared.
- Unplanned or emergency releases
  - Use high-temperature flaring if gas is not recoverable.

- Vapor recovery
    - Use enclosed tanks instead of open pits to reduce fugitive VOC emissions; and
    - use vapor recovery units on storage tanks.
- Inspection and maintenance
    - Use and maintain proper hatches, seals, and valves;
    - optimize glycol circulation and install a flash tank separator;
    - use selective catalytic reduction; and
    - replace high-bleed with low-bleed devices on pneumatic pumps.
- Monitoring and repair
    - Use directed inspection and maintenance methods to identify and cost-effectively fix fugitive gas leaks; and
    - install an air quality monitoring station.

3.2.7 Potential Air Quality Impacts

Based on the existing air quality of the region and the typical air emissions of similar oilfield projects, and implementation of BMPs identified in Section 3.2.6, the Proposed Action would not produce significant increases in criteria pollutants, GHGs, or HAPs.

3.3 WATER RESOURCES

3.3.1 Surface Water

As shown in Figure 3.2, the proposed well pads, and their access roads, are located near Lake Sakakawea, which is classified by the U.S. Geological Survey (USGS) as perennial. Given the topography of the individual sites over the project area, runoff occurs largely as sheet-flow.

The proposed well pads are located in the Upper Moccasin Creek sub-watershed (hydrologic unit code [HUC] 101102050604) of the Waterchief Bay Watershed (Figure 3.2), which is part of the Lower Little Missouri River subbasin, Little Missouri basin, Little Missouri subregion, and Missouri region.

Runoff from the four well pads in Sections 11 and 12 would flow south into an unnamed intermittent waterway (HUC 10110205001652, 10110205001654, and 10110205001649), which flows south into Moccasin Creek (HUC 10110205000020). Runoff from the well pad in the NENW Section 23 would flow south down an unnamed draw and into a reach of Moccasin Creek (HUC 10110205000021). Runoff from the well pad in the NWNE Section 23 would flow east into the previously mentioned unnamed intermittent water way (HUC 10110205001649) joining any runoff from the well pads in Sections 11 and 12. It would then travel approximately 10.74 miles until reaching Moccasin Creek Bay and the perennial waters in Lake Sakakawea (Figure 3.3) (USGS 2010).

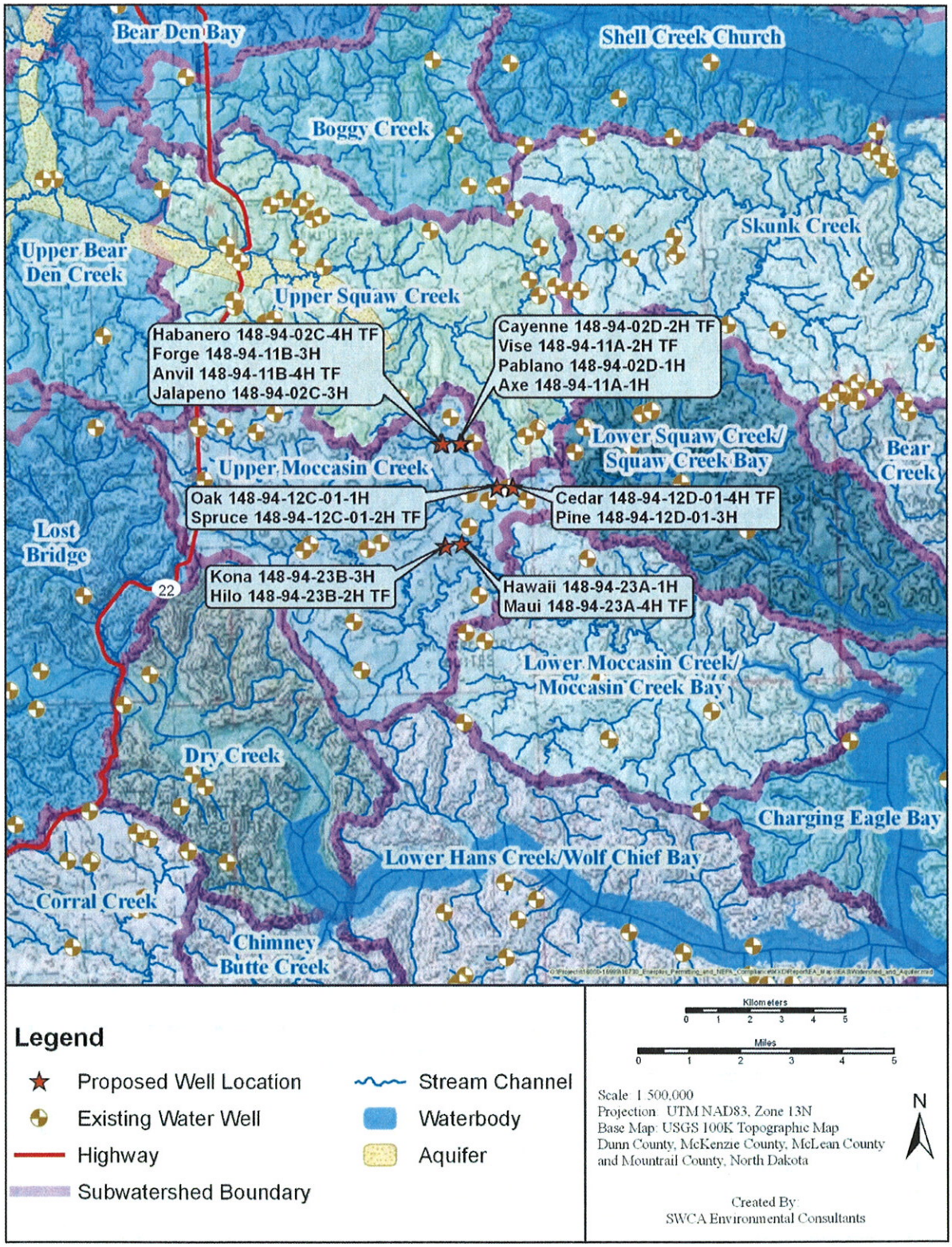


Figure 3.2. Watersheds and aquifers near the project area.

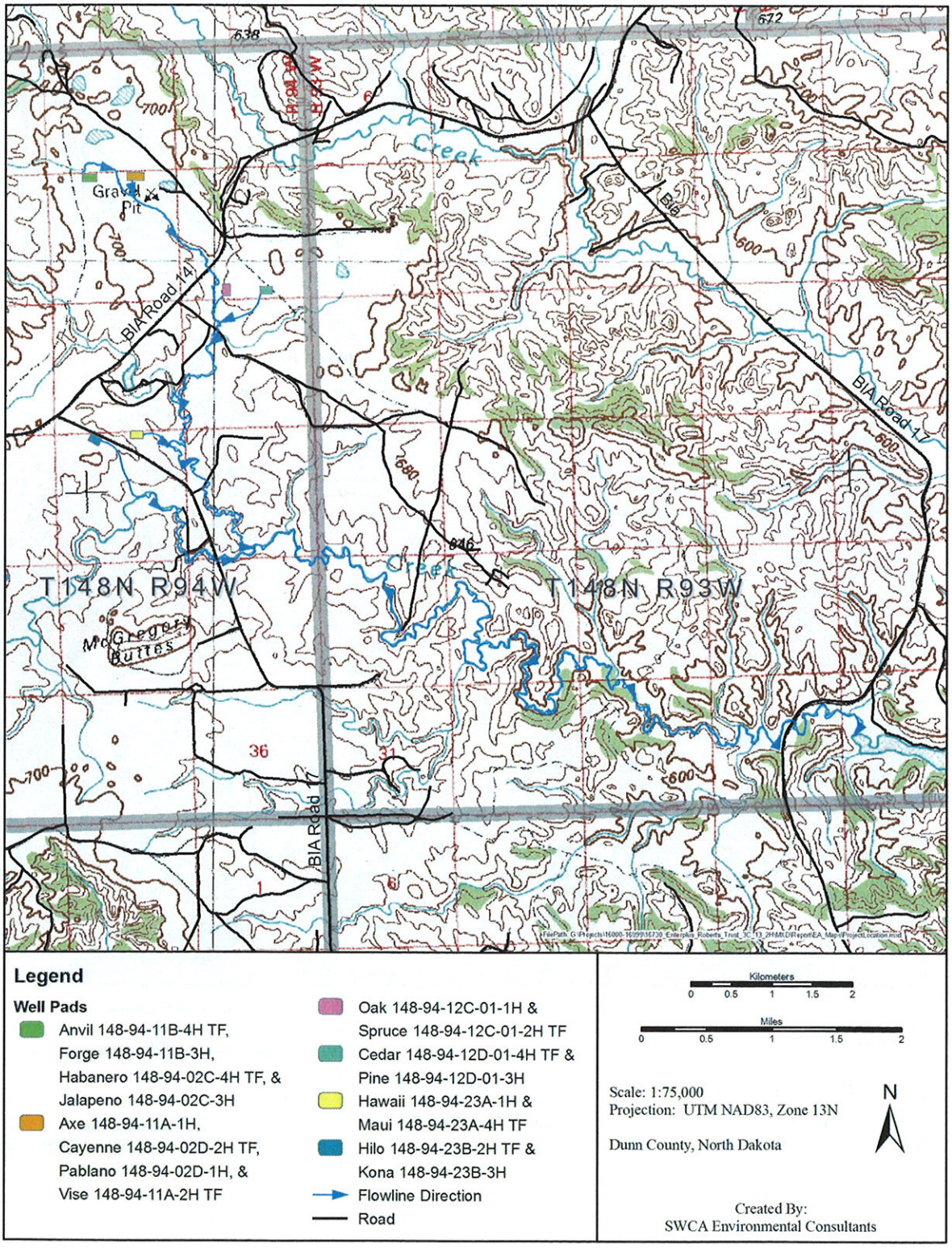


Figure 3.3. Surface runoff and drainage direction from each of the proposed well pads.

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.

3.3.2 Groundwater

Aquifers in the project area and surrounding region include, from deepest to shallowest, the Cretaceous Fox Hills and Hell Creek formations and the Tertiary Ludlow, Tongue River, and Sentinel Butte formations (Table 3.3). Several shallow aquifers related to post-glacial outwash composed of till, silt, sand, and gravel are located in Dunn County. However, none are within the proposed project areas (Figure 3.2). The shallow Sentinel Butte Formation, commonly used for domestic supply in the area, outcrops in Dunn County and meets standards of the NDDH (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 38 existing water wells within a 5-mile boundary of the proposed project areas (Table 3.4). Five wells (148-094-02, 148-094-11AAA2, 148-094-12DCC, 148-094-13BBD, and 148-094-14AAB) are within 1 mile of the project wells. 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.

3.3.3 Potential Impacts to Surface Water and Groundwater Resources

No significant adverse impacts to surface water or groundwater resources are anticipated based on the location, design, and drilling methods of the Proposed Action.

Table 3.3. 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.

Sources: Croft 1985; Klausing 1979.
gal/min = gallons per minute

Table 3.4. 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
148-093-04	Pat Fredericks	1985	4	148/93	Domestic	71	Unknown	Pine 148-94-12D-01-3H	3.15
148-093-04CAB1	NDSWC 4596A	1973	4	148/93	Unused	340	Unknown	Pine 148-94-12D-01-3H	2.92
148-093-04CAB2	NDSWC 4596B	1973	4	148/93	Unused	190	Tongue River	Pine 148-94-12D-01-3H	2.92
148-093-06CCA	Rudolph Sanders	9/1/1981	6	148/93	Stock	Unknown	Unknown	Pine 148-94-12D-01-3H	1.27
148-093-17BBD	J. McKenze	Unknown	17	148/93	Unused	160	Unknown	Pine 148-94-12D-01-3H	1.50
148-094-02	Garland Beston	3/5/1982	2	148/94	Domestic	200	Unknown	Cayenne 148-94-02D-2H TF	0.52
148-094-05BCB	USGS	10/27/1994	5	148/94	Monitoring	106	Unknown	Habanero 148-94-02C-4H TF	3.26
148-094-06CBB	Gabe Fettig	10/12/2002	6	148/94	Stock	1850	Unknown	Habanero 148-94-02C-4H TF	4.18
148-094-'06DBD	Tribal	Unknown	6	148/94	Stock	Unknown	Unknown	Habanero 148-94-02C-4H TF	3.56
148-094-11AAA2	USGS	9/26/1994	11	148/94	Monitoring	58	Unknown	Axe 148-94-11A-1H	0.23
148-094-12DCC	USGS	6/23/1992	12	148/94	Monitoring	52	Unknown	Cedar 148-94-12D-01-4H TF	0.08

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
148-094-13BBD	B. Hall	1967	13	148/94	Domestic and Stock	30	Unknown	Oak 148-94-12C-01-1H	0.28
148-094-14AAB	USGS	6/22/1992	14	148/94	Monitoring	315	Unknown	Oak 148-94-12C-01-1H	0.54
148-094-15CC2	USGS	9/20/1994	15	148/94	Monitoring	40	Unknown	Hilo 148-94-23B-2H TF	1.23
148-094-17DCD2	USGS	9/19/1994	17	148/94	Monitoring	72	Unknown	Hilo 148-94-23B-2H TF	2.60
148-094-20ABB	Curtis Hall	2009	20	148/94	Domestic	220	Unknown	Hilo 148-94-23B-2H TF	2.75
148-094-21AAB1	USGS	9/16/1994	21	148/94	Monitoring	190	Unknown	Hilo 148-94-23B-2H TF	1.50
148-094-21AAB2	USGS	9/16/1994	21	148/94	Monitoring	125	Unknown	Hilo 148-94-23B-2H TF	1.50
148-094-26AAA	Matt Young Bird	1973	26	148/94	Domestic	124	Unknown	Hawaii 148-94-23A-1H	1.52
148-094-28	Matt Young Bird, Sr.	3/5/1982	28	148/94	Domestic	260	Sentinel Butte	Hilo 148-94-23B-2H TF	2.29
148-095-12DB	Joe Woundedface	7/12/1993	12	148/95	Domestic	58	Unknown	Habanero 148-94-02C-4H TF	4.58
148-095-12DCC2	NDSWC	6/23/1992	12	148/95	Monitoring	52	Unknown	Habanero 148-94-02C-4H TF	4.71
149-093-16BDD	Paul Rosario	8/15/1994	16	149/93	Domestic	460	Sentinel Butte	Axe 148-94-11A-1H	4.68
149-093-21AAD	Gerald Fox	12/14/2000	21	149/93	Domestic	100	Sentinel Butte	Axe 148-94-11A-1H	4.13
149-093-21DCA	E. Wicker	Unknown	21	149/93	Unused	35	Unknown	Axe 148-94-11A-1H	3.46

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
149-093-22CCD	Arla Muzzy	7/17/2002	22	149/93	Domestic	100	Unknown	Axe 148-94-11A-1H	3.58
149-093-27ABA2	Patricia McKenzie	8/12/2004	27	149/93	Domestic	130	Sentinel Butte	Axe 148-94-11A-1H	3.81
149-093-27BAA	USGS	10/24/1994	27	149/93	Monitoring	62	Unknown	Axe 148-94-11A-1H	3.65
149-093-27CAD	USGS	10/11/1994	27	149/93	Monitoring	170	Unknown	Axe 148-94-11A-1H	3.15
149-093-28 AA	Ken Danks	10/16/2009	28	149/93	Industrial	1680	Unknown	Axe 148-94-11A-1H	3.27
149-094-23ACD	USGS	10/26/1994	23	149/94	Monitoring	120	Sentinel Butte	Habanero 148-94-02C-4H TF	4.13
149-094-23BBA	USGS	10/25/1994	23	149/94	Monitoring	69	Unknown	Habanero 148-94-02C-4H TF	4.74
149-094-27	Margaret Wolf	3/5/1982	27	149/94	Domestic	64	Unknown	Habanero 148-94-02C-4H TF	4.14
149-094-27ACD	George Wolf	5/19/1973	27	149/94	Domestic	36	Unknown	Habanero 148-94-02C-4H TF	4.04
149-094-27CB	George Wolf	5/19/1973	27	149/94	Domestic	36	Unknown	Habanero 148-94-02C-4H TF	4.38
149-094-28AAA1	NDSWC	1992	28	149/94	Monitoring	320	Unknown	Habanero 148-94-02C-4H TF	4.86

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
149-094-28AAA2	NDSWC	1992	28	149/94	Monitoring	120	Unknown	Habanero 148-94-02C-4H TF	4.86
149-094-28AAD	USGS	1992	28	149/94	Monitoring	120	Unknown	Habanero 148-94-02C-4H TF	4.80

Source: North Dakota State Water Commission 2010.

3.4 WETLANDS, HABITAT, AND WILDLIFE

3.4.1 Wetlands

National Wetland Inventory maps maintained by the U.S. Fish and Wildlife Service (USFWS) do not identify any jurisdictional wetlands within the proposed well pads or access roads (USFWS 2010a).

According to the USFWS National Wetland Inventory database, 31 palustrine emergent (PEM) wetlands and two fresh water ponds are located within 0.5 mile of the proposed project areas (Figure 3.4). None of the access roads or well pads would intersect any of the identified wetlands.

Enerplus would use standard BMPs and construction techniques to prevent sediment runoff from well pads and access roads from reaching identified wetlands and intermittent water bodies and to prevent any downstream impact to Lake Sakakawea. Due to the location of these PEM wetlands and previously described mitigation measures, no adverse impacts are expected as a result of construction, drilling, or production activities associated with the proposed well pad areas and associated access roads.

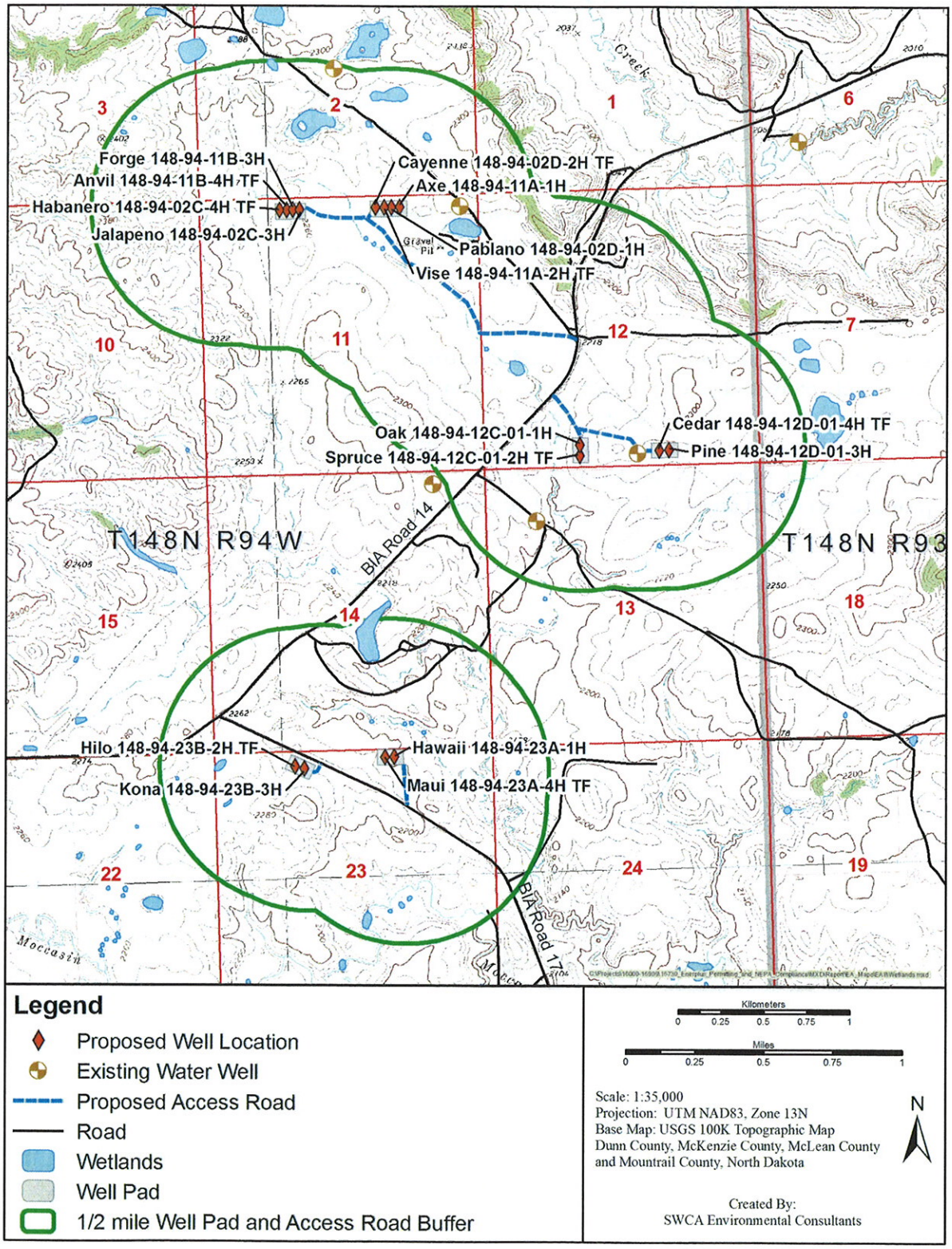


Figure 3.4. National Wetland Inventory identified wetlands within 0.5 mile of proposed project areas.

3.4.2 Wildlife

Several wildlife species that may exist in Dunn County are listed as threatened or endangered under the Endangered Species Act (ESA). Listed species in Dunn County include the black-footed ferret, gray wolf, interior least tern, pallid sturgeon, piping plover, and whooping crane (USFWS 2010b). 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 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. Species listed by the USFWS are described below.

CANDIDATE SPECIES

Dakota Skipper (*Hesperia dacotae*)
Status: Canidate
Likelihood of impact: May affect, but is not likely to adversely affect

Dakota skippers are not known to occur within the project area; however, suitable habitat does occur. The use of BMPs and conservation guidelines (USFWS 2007) during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

ENDANGERED SPECIES

Black-footed Ferret (*Mustela nigripes*)
Status: Endangered
Likelihood of impact: No effect

Several isolated populations are known to exist within the United States. However, this species is presumed extirpated from North Dakota because it has not been observed in the wild for over 20 years.

Gray Wolf (*Canis lupus*)
Status: Endangered
Likelihood of impact: No effect

Due to a lack of forested habitat and distance from Minnesota and Manitoba populations, as well as the troubled relationship between humans and wolves and their vulnerability to being shot in open habitats (Licht and Huffman 1996), the re-establishment of gray wolf populations in North Dakota is unlikely.

Interior Least Tern (*Sterna antillarum*)
Status: Endangered
Likelihood of impact: May affect, but is not likely to adversely affect

Suitable shoreline habitat for breeding and nesting terns does not occur in the project area, and Lake Sakakawea is a minimum of 6.5 miles away from the proposed well pads and access roads. It is unlikely that terns would visit the upland habitats present in the project area.

Whooping Crane (*Grus americana*)
Status: Endangered
Likelihood of impact: May affect, but is not likely to adversely affect

Suitable whooping crane foraging habitat (i.e., cultivated cropland) was observed near the project area. However, project precautionary measures would be implemented if a whooping crane is sighted in or near the project area. Enerplus would cease all drilling and construction activities and notify the USFWS of the sighting, should a crane be spotted within 1 mile of the project area.

THREATENED SPECIES

Piping Plover (*Charadrius melodus*)
Status: Threatened
Likelihood of impact: May affect, but is not likely to adversely affect

Suitable shoreline habitat for breeding and nesting plovers does not occur in the project area, and Lake Sakakawea is a minimum of 6.5 miles away from the proposed well pads and access roads. It is unlikely that migrating plovers would visit the project area during their migration.

Pallid Sturgeon (*Scaphirhynchus albus*)
Status: Threatened
Likelihood of impact: May affect, but is not likely to adversely affect

Suitable habitat for pallid sturgeon does not occur in the project area, and Lake Sakakawea is a minimum of 10.74 river miles away from the proposed well pads and access roads. However, Moccasin Creek, which drains the project area, is a perennial tributary to the Missouri River in Lake Sakakawea. Potential pollution and sedimentation occurring within the project area are concerns for downstream populations of threatened pallid sturgeon. Activities associated with the construction, production, or reclamation of the proposed project area are not anticipated to adversely affect water quality and subsequently the pallid sturgeon.

MIGRATORY BIRD TREATY ACT / THE BALD AND GOLDEN EAGLE PROTECTION ACT

Bald Eagle (*Haliaeetus leucocephalus*)
Status: Delisted in 2007
Likelihood of impact: No adverse effects anticipated

The project areas are between 6.0 and 7.5 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). Suitable habitat does not occur within 0.5 mile of the proposed well pad locations. However, surveys for eagle nests were completed and no eagles or eagle nests were found.

Golden Eagle (*Aquila chrysaetos*)
Status: Unlisted; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act
Likelihood of impact: No adverse effects anticipated

The golden eagle prefers habitat characterized by open prairie, plains, and forested areas. Usually, golden eagles can be found in proximity to badland cliffs which provide nesting habitat. Suitable habitat does occur within 0.5 mile of the proposed well pad locations. However, surveys for eagle nests were completed and no eagles or eagle nests were found.

Sprague's Pipit (*Anthus spragueii*)
Status: Canidate; protected under the Migratory Bird Treaty Act
Likelihood of impact: May affect, is not likely to adversely affect

Sprague's pitit habitat consists of relatively large patches (170–776 acres) of native prairie which has never been plowed in its history, but will use non-native grasslands when native prairie is unavailable. They prefer prairie that exhibit regular disturbance preventing the encroachment and domination by woody species. Disturbance can come through fire and grazing; grazing is the most predominant form of disturbance within the project area.

The wildlife species listed in Table 3.5 were observed during field visits to the proposed project areas. All species listed were visually observed by a biologist during the field survey (i.e., primary observation). Various secondary indicators, including scat, tracks, and animal carcasses, were not observed within the proposed project areas.

Table 3.5. Wildlife Observed during Field Surveys at the Proposed Project areas.

Well Pad Area	Common Name	Scientific Name	Observation Type	Habitat
NWNE Section 11	clay colored sparrow	*Spizella pallida*	Direct	Grassland/ shrubs
NENW Section 11	mule deer	*Odocoileus hemionus*	Direct	Wooded draws and open meadows
	sharp-tailed grouse	*Tympanuchus phasianellus*	Direct	Wooded draws and open meadows

3.4.3 Potential Impacts to Wetlands, Habitat, and Wildlife

With the implementation of standard BMPs, no riparian or wetland habitats are anticipated to be directly or indirectly impacted by the proposed access roads or wells.

Indirect effects of the project on listed species could result from human disturbance and increases in vehicular traffic during drilling and commercial production, as well as indirectly from habitat degradation, sedimentation, or accidental release of drilling fluids or hazardous materials from the drilling, construction, or operation of the wells. If construction is planned during the critical season, a migratory bird survey would be conducted prior to commencement of construction. Additionally, Enerplus has committed to using a semi-closed

loop drilling system, ensuring that the reserve pit would 1) be smaller than a typical pit, and 2) would contain only dry cuttings, which would be solidified with fly ash and buried in place following completion of drilling operations. For additional information on general BMPs and other operator-committed measures, please see Sections 2.2.8, Construction Details at Individual Sites, and 3.11, Mitigation and Monitoring.

Minor impacts to unlisted wildlife species and their habitats could result from the construction of six well pads, associated access roads, increased vehicular traffic density, drilling activities, and long-term disturbances during commercial production. Ground clearing may impact habitat for small birds, small mammals, and other wildlife species. The proposed project 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.

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 impacts.

3.5 SOILS

3.5.1 Natural Resources Conservation Service Soil Data

The project area is 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.

The Natural Resources Conservation Service (NRCS 2010) soil series present on the well pads and access road areas, and their respective acreages, are listed in Table 3.6. The acreage shown in Table 3.6 is based on the spatial extent of soil series combinations derived from NRCS data Figure 3.5 and 3.6); therefore, the acreage is approximate and used as a best estimate of soil series distribution at each of the proposed project areas.

Table 3.6. Percentage of the Project area Comprised of Specific Soil Types.

Feature	Soil Series	Acres	% of Location
NENW Section 11			
Well Pad	Farland-Rhoades silt loam, 0 to 6 percent slopes	0.07	1
	Dogtooth-Cabba complex, 9 to 15 percent slopes	4.65	99
Access Road	Farland-Rhoades silt loam, 0 to 6 percent slopes	0.93	33
	Harriet silt loam, 0 to 2 percent slopes	1.88	67
NWNE Section 11			
Well Pad	Arnegard loam, 0 to 2 percent slopes	1.52	31
	Wabek gravelly loam, 2 to 15 percent slopes	0.25	5
	Flaxton-Williams complex, 0 to 6 percent slopes	0.50	10
	Harriet silt loam, 0 to 2 percent slopes	1.57	32
	Pits, gravel, and sand	1.10	22
Access Road	Harriet silt loam, 0 to 2 percent slopes	2.98	41
	Wabek gravelly loam, 2 to 15 percent slopes	1.40	20
	Bowdle loam, 2 to 6 percent slopes	1.55	22
	Arnegard loam, 0 to 2 percent slopes	0.84	12
	Rhoades silt loam, 0 to 6 percent slopes	0.05	<1
	Belfield-Morton silt loams, 0 to 6 percent slopes	0.31	4
SESW Section 12			
Well Pad	Amor-Cabba loams, 9 to 15 percent slopes	4.27	100
Access Road	Harriet silt loam, 0 to 2 percent slopes	1.17	53
	Rhoades silt loam, 0 to 6 percent slopes	0.36	16
	Amor-Cabba loams, 9 to 15 percent slopes	0.70	31
SWSE Section 12			
Well Pad	Rhoades silt loam, 0 to 6 percent slopes	2.23	57
	Farland-Rhoades silt loam, 0 to 6 percent slopes	0.41	11
	Williams-Noonan loams, 3 to 6 percent slopes	1.24	32
Access Road	Belfield-Morton silt loams, 0 to 6 percent slopes	1.42	39
	Amor-Cabba loams, 9 to 15 percent slopes	0.88	24
	Farland-Rhoades silt loam, 0 to 6 percent slopes	0.94	26
	Cabba loam, 15 to 45 percent slopes	0.10	3
	Regent-Dogtooth silty clay loams, 6 to 9 percent slopes	0.27	8
NENW Section 23			
Well Pad	Rhoades silt loam, 0 to 6 percent slopes	3.96	100
Access Road	Rhoades silt loam, 0 to 6 percent slopes	0.35	100
NWNE Section 23			
Well Pad	Cabba loam, 15 to 45 percent slopes	0.12	3
	Rhoades silt loam, 0 to 6 percent slopes	3.93	97
Access Road	Cabba loam, 15 to 45 percent slopes	0.75	64
	Rhoades silt loam, 0 to 6 percent slopes	0.19	16
	Cabba extremely stony loam, 3 to 25 percent slopes	0.24	20

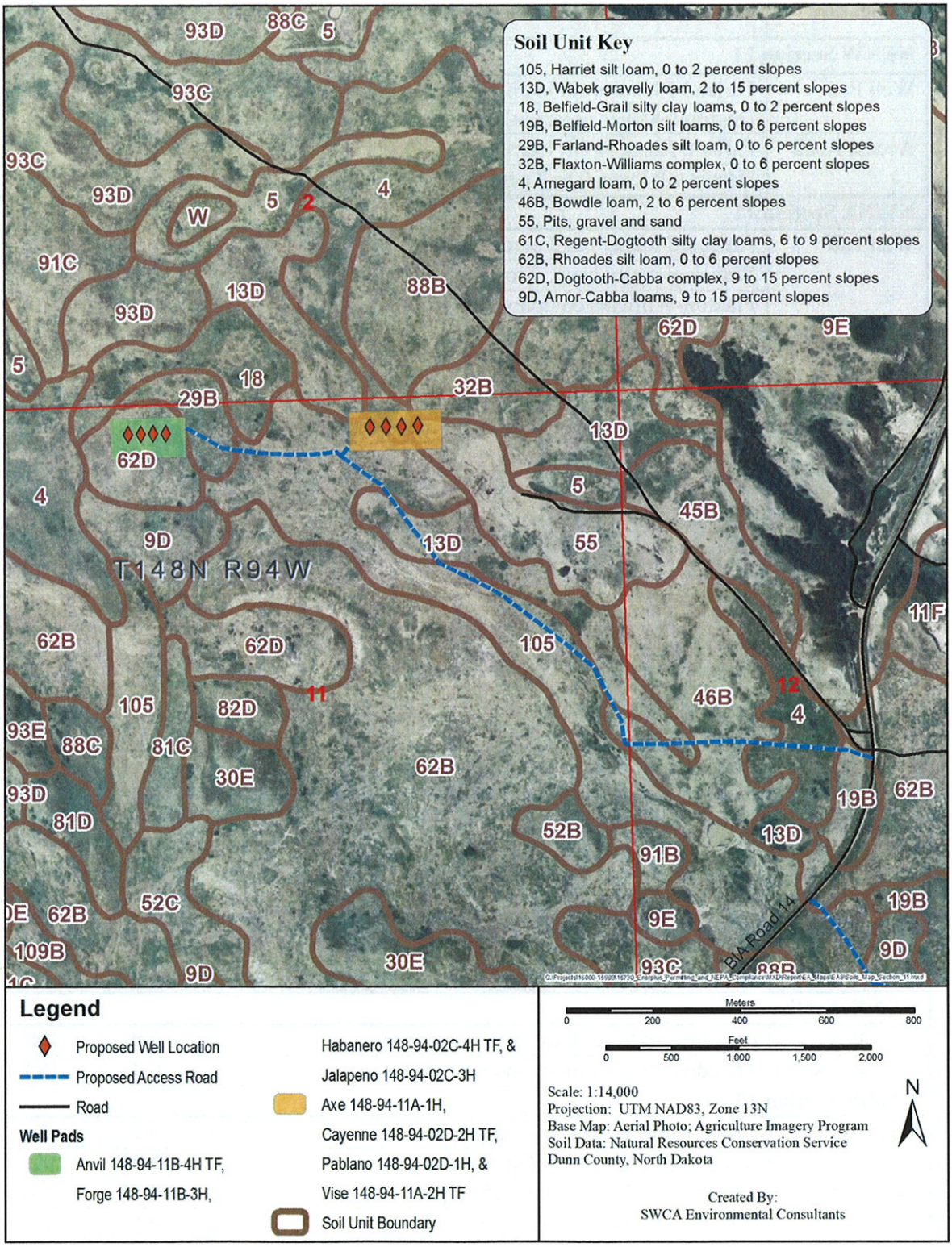


Figure 3.5. Approximate spatial extent of soil types within and around the well pads in Section 11, T148N, R94W.

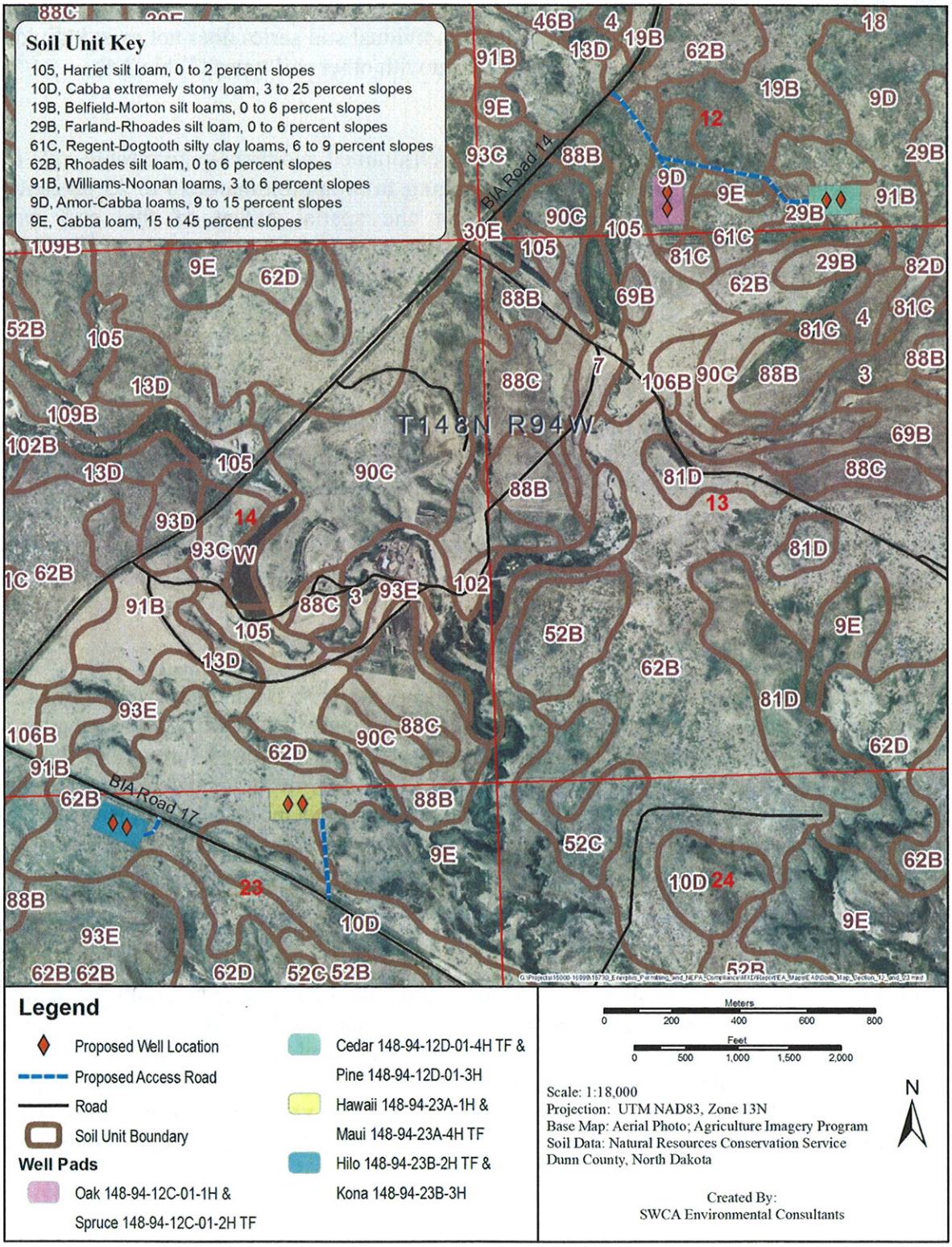


Figure 3.6. Approximate spatial extent of soil types within and around the well pads in Sections 12 and 23, T148N, R94W.

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 within the project area, but rather in combination with other soil types (Table 3.6).

3.5.1.1 Amor

The Amor series consists of moderately deep, well-drained, moderately permeable soils found on sandstone bedrock uplands with slopes ranging from approximately 0 to 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. This soil type is largely used for cultivation of small grains, flax, and corn. Native vegetation species common to this soil type include needle and thread (*Hesperostipa comata*), western wheatgrass (*Pascopyrum smithii*), and blue grama (*Bouteloua gracilis*) (NRCS 2009).

3.5.1.2 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, green needlegrass (*Nasella viridula*), big bluestem (*Andropogon gerardii*), and blue grama (NRCS 2009).

3.5.1.3 Belfield

The Belfield series consists of deep and very deep, well- to moderately well-drained, very slowly permeable soils found on upland flats, terraces, and swales with slopes ranging from approximately 0 to 9 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 43°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include western wheatgrass, blue grama, and green needlegrass (NRCS 2009).

3.5.1.4 Bowdle

The Bowdle series consists of well-drained soils formed in loamy alluvium underlain by sand and gravel. The soils are moderately deep over sand and gravel and are on outwash plains and stream terraces. Permeability is moderate in the solum and rapid or very rapid in the underlying material. Slopes range from 0 to 15 percent. Mean annual precipitation is about 18 inches, and mean annual air temperature is about 44°F. This soil type is primarily cropped to small grain, alfalfa, and some flax and corn. Native vegetation is primarily western wheatgrass, blue grama, green needlegrass, needle and thread, forbs, and sedges (NRCS 2009).

3.5.1.5 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 (*Schizachyrium scoparium*), green needlegrass, and other various herbs, forbs, and shrub species (NRCS 2009).

3.5.1.6 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).

3.5.1.7 Farland

The Farland series consists of very deep, well-drained soils that formed in stratified alluvium on terraces, valley foot slopes, and fans on uplands. Permeability is moderate or moderately slow. Slope ranges from 0 to 20 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 42°F. Potential native vegetation species found on this soil type include needle and thread, green needlegrass, western wheatgrass, and blue grama (NRCS 2009).

3.5.1.8 Flaxton

The Flaxton series consists of very deep, well-drained soils found on till plain where the predominant slope is between 0 and 15 percent. The permeability is moderately rapid in the upper part of the solum and moderately slow in the lower part of the solum and substratum. 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 most often used for cultivation of small grains and pastureland. Common native plant species which frequent this soil type include western wheatgrass, blue grama, needle and thread, and prairie sandreed (*Calamovilfa longifolia*) (NRCS 2009).

3.5.1.9 Grail

The Grail series consists of deep to very deep, slowly permeable soils that are well- to moderately well-drained. This soil type is found on uplands with slopes ranging from 0 to 15 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. This soil type is largely used for cultivating crops. Native vegetation species common to this soil type include western wheatgrass, big bluestem, and green needlegrass (NRCS 2009).

3.5.1.10 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, drainage ways, and bottom lands. Slope ranges from 0 to 3 percent. Mean annual air temperature is about 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 saltgrass (*Distichlis spicata*) (NRCS 2009).

3.5.1.11 Morton

The Morton series consists of moderately deep, well-drained, moderately permeable soils found in matter weathered from soft calcareous silty shales, siltstones, and fine-grained sandstones. These Morton soils are on uplands and have slopes of 0 to 15 percent. The mean annual air temperature is 42°F, and the mean annual precipitation is 15 inches. Cultivated areas are used for growing small grains, flax, corn, hay, and pasture. Native vegetation is mid- and short-prairie grasses such as western wheatgrass, green needlegrass, and blue grama (NRCS 2009).

3.5.1.12 Noonan

The Noonan series consists of very deep, well-drained or moderately well-drained soils formed in till. Permeability is moderate on the surface and slow in the Btn horizons. These soils are on till plains and uplands and have slopes of 0 to 15 percent. Mean annual air temperature is 39°F, and mean annual precipitation is 14 inches. This soil type is used for spring seeded small grains and pasture. Native vegetation includes western wheatgrass and blue grama (NRCS 2009).

3.5.1.13 Pits, Gravel, and Sand

The pits unit is in areas from which the overlying soil material has been removed in order to mine sand; gravel; large porcelanite fragments (scoria or clinkers); or coal. The vertical walls of the pits are generally unstable and may be subject to slippage and slides. Abandoned pits are idle or are used for wildlife habitat or stock water ponds. Water seeps out of the very permeable sand, gravel, scoria, or coal and forms ponds in some mine sinks. Pits are generally not suited to cultivated crops, hay, pasture, and the trees and shrubs grown as windbreaks and environmental planting.

3.5.1.14 Regent

The Regent series consists of moderately deep, well-drained soils found on uplands. Permeability is slow with slopes ranging from approximately 0 to 45 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 most often for cultivation of small grains, hay, and pasture. Native vegetation species common to this soil type include blue grama, green needlegrass, and western wheatgrass (NRCS 2009).

3.5.1.15 Rhoades

The Rhoades series consists of deep and very deep, well to moderately well-drained, very slowly permeable soils found on swales and uplands with slopes ranging from approximately 0 to 25 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 rangeland foraging. Native vegetation species common to this soil type include western wheatgrass and blue grama (NRCS 2009).

3.5.1.16 Wabek

The Wabek series consists of very deep, excessively drained, rapidly and very rapidly permeable soils formed in sand and gravel glaciofluvial deposits. These soils are on outwash plains, beach ridges, terraces, and terrace escarpments with slopes of 0 to 45 percent. Mean

annual air temperature is 42°F, and mean annual precipitation is 16 inches. This soil type is used mainly for range and pasture. Native vegetation is blue grama, upland sedges (*Carex* spp.), western wheatgrass, needle and thread, and forbs (NRCS 2009).

3.5.1.17 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).

3.5.2 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 3.7. Additionally, redoximorphic features (i.e., reduced/oxidized iron or manganese deposits), and soil texture were noted at each soil pit. A Munsell Soil Color Chart was used to determine the color of moist soil samples.

Table 3.7. Soil Data Obtained through the Excavation of Soil Pits within the Proposed Project area.

Feature	Pit Depth (inches)	Soil Matrix Color (color name)	Redoximorphic Feature Color	Texture	Slope (°)	K Factor
NENW Section 11						
Well Pad/ Access Road	0–8	10YR 3/4 (dark yellowish-brown)	None Observed	Silty Clay Loam	3–5	0.37
Well Pad/ Access Road	8–16	10YR 4/3 (brown)	None Observed	Silty Clay Loam	3–5	0.37
NWNE Section 11						
Well Pad/ Access Road	0–6	10YR 3/3 (dark brown)	None Observed	Silty Clay Loam	0–1	0.37
Well Pad/ Access Road	6–16	10YR 4/3 (brown)	None Observed	Silty Clay Loam	0–1	0.37
SESW Section 12						
Well Pad/ Access Road	0–7	10YR 4/2 (dark grayish-brown)	None Observed	Silty Clay Loam	3–5	0.32
Well Pad/ Access Road	7–16	10YR 5/2 (grayish-brown)	None Observed	Silty Clay Loam	3–5	0.32

Feature	Pit Depth (inches)	Soil Matrix Color (color name)	Redoximorphic Feature Color	Texture	Slope (°)	K Factor
SWSE Section 12						
Well Pad/ Access Road	0–10	10YR 6/3 (pale brown)	None Observed	Silty Clay	1–3	0.32
Well Pad/ Access Road	10–16	10YR 5/3 (brown)	None Observed	Silty Clay	1–3	0.32
NENW Section 23						
Well Pad/ Access Road	0–6	10YR 3/2 (very dark grayish-brown)	None Observed	Silty Clay Loam	1–3	0.32
Well Pad/ Access Road	6–15	10YR 5/2 (grayish-brown)	None Observed	Silty Clay Loam	1–3	0.32
NWNE Section 23						
Well Pad/ Access Road	0–10	10YR 4/3 (brown)	None Observed	Silty Clay Loam	3–5	0.32
Well Pad/ Access Road	10–16	10YR 5/2 (grayish-brown)	None Observed	Silty Clay Loam	3–5	0.32

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).

3.5.3 Potential Impacts from Soil Erosion

3.5.3.1 NENW Section 11

1. The well pad is dominated by the Dogtooth-Cabba complex (91%), and the proposed new access road is dominated by the Harriet silt loam (68%) and Farland-Rhoades silt loam (32%) (Table 3.7).
2. These soil types may have variable run-off depending on the slope, which ranges between 9 and 15 percent for the Dogtooth-Cabba, 0 and 2 percent for the Harriet, and 0 to 6 percent for the Farland-Rhoades (NRCS 2010).
3. Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
4. This location has a Soil Erodibility Factor (K) of 0.37. The Revised Universal Soil Loss Equation (RUSLE) calculation indicates a possible 6.00 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.

3.5.3.2 NWNE Section 11

1. The well pad is dominated by the Harriet silt loam (32%) and the Arnegard loam (31%) (Table 3.6); the access road is also dominated by the Harriet silt loam (40%) and also contains Bowdle loam (22%).
2. The Harriet and Arnegard soil series are found on slopes typically ranging from 0 to 2 percent. The Bowdle loam soil series is found on slopes ranging from 2 to 6 percent (NRCS 2010).
3. 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).
4. This location has a K Factor of 0.37. The RUSLE calculation indicates a possible 0.00 ton/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.

3.5.3.3 SESW Section 12

1. The well pad is dominated by the Armor-Cabba loam (100%), and the proposed new access road is dominated by Harriet silt loam (53%) and Armor-Cabba loam (31%) (Table 3.7).
2. These soil types may have variable run-off depending on the slope, which ranges between 9 and 15 percent for the Armor-Cabba loam, and 0 and 2 percent for the Harriet silt loam (NRCS 2010).
3. Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
4. This location has a K Factor of 0.32. The RUSLE calculation indicates a possible 6.12 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.

3.5.3.4 SWSE Section 12

1. The well pad is dominated by the Rhoades silt loam (57%) and the Williams-Noonan loams (32%). The proposed new access road is dominated by the Belfield-Morton silt loam (39%), the Armor Cabba loam (24%), and Farland-Rhoades silt loam (26%) (Table 3.7).
2. These soil types may have variable run-off depending on the slope, which ranges between 0 and 6 percent for the Rhoades silt loam, 3 and 6 percent for the Williams-Noonan loam, 0 and 6 percent for the Belfield-Morton silt loam, 9 to 15 percent for the Armor-Cabba loam, and 0 to 6 percent for the Farland-Rhodes silt loam (NRCS 2010).
3. Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).

4. This location has a K Factor of 0.32. The RUSLE calculation indicates a possible 2.66 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.

3.5.3.5 NENW Section 23

1. The well pad and proposed new access road are each dominated (100%) by the Rhoades silt loam (Table 3.7).
2. This soil type may have variable run-off depending on the slope, which ranges between 0 and 6 percent (NRCS 2010).
3. Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
4. This location has a K Factor of 0.32. The RUSLE calculation indicates a possible 5.99 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.

3.5.3.6 NWNE Section 23

1. The well pad is dominated by the Rhoades silt loam (97%), and the proposed new access road is dominated by the Cabba loam (64%) and the Cabba extremely stony loam (21%) (Table 3.7).
2. These soil types may have variable run-off depending on the slope, which ranges between 0 and 6 percent for the Rhoades silt loam, 15 and 45 percent for the Cabba, and 3 to 25 percent for the Cabba extremely stony loam (NRCS 2010).
3. Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
4. This location has a K Factor of 0.32. The RUSLE calculation indicates a possible 5.99 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.

3.5.3.7 General

Precautions should be taken during construction activities to prevent erosion. 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; BLM and USFS 2007; Grah 1997).

The soil types are not expected to create unmanageable erosion issues or interfere with reclamation of the area. 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 would reduce project effects and maintain negligible levels of erosion; therefore, no significant adverse impacts to soil resources are anticipated.

3.6 VEGETATION AND INVASIVE SPECIES

3.6.1 Vegetation Data

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 little bluestem, blue grama, side-oats grama (*Bouteloua curtipendula*), green needlegrass, and western wheatgrass. 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*).

3.6.1.1 NENW Section 11

Vegetation noted at the well pad area includes western snowberry, green needlegrass, prairie sagewort (*Artemisia frigida*), silver buffaloberry, and little bluestem.

3.6.1.2 NWNE Section 11

Vegetation noted at the well pad area includes western snowberry, green needlegrass, silver sagebrush (*Artemisia cana*), prairie sagewort, and needle and thread.

3.6.1.3 SESW Section 12

Vegetation noted at the well pad area includes western snowberry, green needlegrass, sagebrush (*Artemisia* spp.), prairie sagewort, little bluestem, blacksamson Echinacea (*Echinacea angustifolia*), and yellow sweetclover (*Melilotus officinalis*).

3.6.1.4 SWSE Section 12

Vegetation noted at the well pad area includes western snowberry, green needlegrass, sagebrush, silver sagebrush, prairie junegrass (*Koeleria macrantha*), upright prairie coneflower (*Ratibida columnifera*), and yellow sweetclover.

3.6.1.5 NENW Section 23

Vegetation noted at the well pad area includes western snowberry, green needlegrass, sagebrush, prairie sagewort, needle and thread, blacksamson Echinacea, and yellow sweetclover.

3.6.1.6 NWNE Section 23

Vegetation noted at the well pad area includes western snowberry, green needlegrass, sagebrush, silver sagebrush, needle and thread, blacksamson Echinacea, and little bluestem.

3.6.2 Noxious Weeds

Noxious weeds have the potential to detrimentally affect public health, ecological stability, and agricultural practices. North Dakota recognizes 11 species as noxious. Although Dunn

County does not officially recognize any additional species, four species were known to exist in Dunn County in 2009. Table 3.8 indicates the 2009 total acreage for each noxious species, as no acres have been reported for 2010. Black henbane is not recognized as a noxious weed in Dunn County or as a North Dakota State noxious weed; however, black henbane is recognized as a noxious weed in five other counties in North Dakota including neighboring McKenzie County. Additional information on listed species is available from the NRCS Plants Database for North Dakota at http://www.plants.usda.gov.

Table 3.8. Occupied Area for Recognized Noxious Weeds in Dunn County, North Dakota.

Common Name	Scientific Name	Dunn County (acres)
absinth wormwood	*Artemisia absinthium*	39,300
Canada thistle	*Cirsium arvense*	28,500
Dalmatian toadflax	*Linaria dalmatica*	--
diffuse knapweed	*Centaurea diffusa*	--
field bindweed	*Convolvulus arvensis*	--
leafy spurge	*Euphorbia esula*	18,300
musk thistle	*Carduus nutans*	--
purple loosestrife	*Lythrum salicaria*	--
Russian knapweed	*Acroptilon repens*	--
salt cedar	*Tamarix ramosissima*	--
spotted knapweed	*Centaurea stoebe*	--
yellow starthistle	*Centaurea solstitialis*	--
black henbane	*Hyoscyamus niger*	3,000
	Total	**89,100**

Source: North Dakota Department of Agriculture 2010.

"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 have high reproduction 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 late August 2010 indicated that no state or county recognized noxious weeds were documented at any of the proposed well pad locations. Efforts to reduce the spread of noxious weeds would be made during the project construction and maintenance processes. The following guidelines would be followed during construction, reclamation, and maintenance stages of the project to control the spread of noxious weeds.

- Construction equipment, materials, and vehicles would be stored at construction sites or at specified construction yards.

- All personal vehicles, sanitary facilities, and staging areas would be confined to a limited number of specified locations to decrease chances of incidental disturbance and spread of weeds.
- In areas with existing noxious weed infestations, vegetation, soils, and trench spoil material would be stockpiled adjacent to the removal point and, following construction, would be returned to its original locations to prevent spreading.
- Prompt re-establishment of the desired vegetation in disturbed areas is required. Seeding would occur during the frost-free periods after construction. Certified "noxious weed-free" seed would be used on all areas to be seeded.

3.6.3 Potential Impacts on Vegetation and Noxious Weeds

The Proposed Action would result in minor loss of native grassland vegetation. The potential disturbance for each of the six well pad locations is summarized in Table 3.9.

Table 3.9. Potential Disturbance of Native Grassland Vegetation.

Location	Potential Disturbance (acres)
NENW Section 11	
Well Pad	5.19
Access Road	2.81
Total	7.19
NWNE Section 11	
Well Pad	4.95
Access Road	7.04
Total	11.99
SESW Section 12	
Well Pad	4.20
Access Road	2.22
Total	5.54

Location	Potential Disturbance (acres)
SWSE Section 12	
Well Pad	3.68
Access Road	3.62
Total	5.85
NENW Section 23	
Well Pad	3.78
Access Road	0.35
Total	4.13
NWNE Section 23	
Well Pad	3.82
Access Road	1.18
Total	5.00

In addition to the removal of typical native grasslands, removal of existing vegetation may facilitate the spread of invasive species. The APD and this EA require the operator to control noxious weeds throughout project areas. If a noxious weed community is found, it would be eradicated unless the community is too large, in which case it would be controlled or contained to prevent further growth. The services of a qualified weed control contractor would be utilized.

Surface disturbance and vehicular traffic would not take place outside approved ROWs for the well pads. Areas that are stripped of topsoil must be reseeded 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 would reduce the potential establishment of invasive vegetation species.

With implementation of reclamation and the described methods of reducing the spread of noxious weeds, the proposed project would not result in significant adverse impacts to vegetation.

3.7 CULTURAL RESOURCES

Historic properties, or cultural resources, on federal or tribal lands are protected by many laws, regulations, and agreements. Section 106 of the National Historic Preservation Act of 1966 (16 USC 470 et seq.) 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 Indian Reservation.

Cultural resource inventories of these well pads and access roads were conducted by personnel of SWCA Environmental Consultants, using an intensive pedestrian methodology. For the Anvil 148-94-11B-4H TF/Jalapeño 148-94-02C-3H/Habanero 148-94-02C-4H TF/Forge 148-94-11B-3H quadruple well pad project approximately 21 acres were inventoried on August 25, 2010 (Kohler 2010). No historic properties were located that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. 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 this undertaking. This determination was communicated to the THPO on November 3, 2010; however, the THPO did not respond within the allotted 30 day comment period. For the Oak 148-94-12C-01-1H/Spruce 148-94-12C-01-2H TF dual well pad project approximately 13.7 acres were inventoried on August 25, 2010 (Fewings 2010). No historic properties were located that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. 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 this undertaking. This determination was communicated to the THPO on November 24, 2010; however, the THPO did not respond within the allotted 30 day comment period. For the Axe 148-94-11B-4H TF/Vise 148-94-11A-2H TF/Poblano 148-94-02D-1H/Cayenne 148-94-02D-2H TF quadruple well pad project approximately 39.2 acres were inventoried on August 25, 2010 (Hutchinson and Kohler 2010). One archaeological site was located that may possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. 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 this undertaking as the access road was rerouted and the site will be fenced off.. This determination was communicated to the THPO on December 16, 2010; however, the THPO did not respond within the allotted 30 day comment period. For the Pine 148-94-12D-01-3H/Cedar 148-94-12D-01-4H dual well pad project approximately 27 acres were inventoried on August 24, 2010 (Fewings and Kohler 2010a). No historic properties were located that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. 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 this undertaking. This determination was communicated to the THPO on December 27, 2010; however, the THPO did not respond within the allotted 30 day comment period. For the Kona 148-94-23B-3H/Hilo 148-94-23B-2H TF dual well pad project approximately 13.3 acres were inventoried and for the Hawaii 148-94-23A-1H/Maui 148-94-23A-4H TF dual well pad project approximately 18.76 acres were inventoried on August 24 and 25, 2010 (Fewings and Kohler 2010b, 2010c). Three archaeological sites were located that may possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. 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 as the archaeological sites will be avoided. This determination was communicated to the THPO on December 27, 2010; however, the THPO did not respond within the allotted 30 day comment period.

3.7.1 Potential Impacts to Cultural Resources

All four sites recorded during inventory will be avoided by project design; therefore, there would be no adverse impacts to cultural resources as a result of the Proposed Action.

If cultural resources are discovered during construction or operation, the operator shall immediately stop work, secure the affected site, and notify the BIA and THPO. Unexpected or inadvertent discoveries of cultural resources or human remains trigger mandatory federal

procedures that include work stoppage and BIA consultation with all appropriate parties. Following any such discovery, operations would not resume without written authorization from the BIA. Project personnel are prohibited from collecting any artifacts or disturbing cultural resources in the area under any circumstance. Individuals outside the ROW are trespassing. No laws, regulations, or other requirements have been waived; no compensatory mitigation measures are required. The presence of qualified cultural resource monitors during construction activities is encouraged.

3.8 PUBLIC HEALTH AND SAFETY

The Proposed Action would occur in a rural area with two residences located within 1 mile of the proposed well sites (Table 3.10).

Table 3.10. Distance and Direction from Proposed Wells to Nearest Home.

Proposed Well	Feet to Nearest Home	Direction to Nearest Home
NWNE Section 11		
Axe 148-94-11A-1H	6,605	Southeast
Vise 148-94-11A-2H TF	6,703	Southeast
Poblano 148-94-02D-1H	6,656	Southeast
Cayenne 148-94-02D-2H TF	6,765	Southeast
NENW Section 11		
Anvil 148-94-11B-4H TF	7,756	Southeast
Jalapeno 148-94-02C-3H	7,608	Southeast
Habanero 148-94-02C-4H TF	7,800	Southeast
Forge 148-94-11B-3H	7,682	Southeast
SWSE Section 12		
Pine 148-94-12D-01-3H	2,565	Southwest
Cedar 148-94-12D-01-4H TF	2,482	Southwest
SESW Section 12		
Oak 148-94-12C-01-1H	1,381	Southwest
Spruce 148-94-12C-01-2H TF	1,453	Southwest
NWNE Section 23		
Hawaii 148-94-23A-1H	2,136	North
Maui 148-94-23A-4H TF	2,151	North
NENW Section 23		
Kona 148-94-23B-3H	3,036	Northeast
Hilo 148-94-23B-2H TF	3,063	Northeast

Health and safety concerns include sour gas that could be released as a result of drilling activities, hazards introduced by heavy truck traffic, and hazardous materials used or generated during construction, drilling, and/or production activities.

H_2S is extremely toxic in concentrations above 500 parts per million (ppm), but it has not been found in measurable quantities in the Bakken Formation. Before reaching the Bakken, however, drilling would penetrate the Mission Canyon Formation, which is known to contain varying concentrations of H_2S. Contingency plans submitted to the BLM comply fully with relevant portions of Onshore Oil and Gas Order No. 6 to minimize potential for gas leaks during drilling. Emergency response plans protect both the drilling crew and the general public within 1 mile of a well; precautions include automated sampling and monitoring by drilling personnel stationed at each well site.

Standard mitigation measures would be applied, and because release of H_2S at dangerous concentration levels is very unlikely, no direct impacts from H_2S are anticipated with implementation of the project.

Tanker trips would depend on production, but Enerplus estimates approximately two trucks per day during the initial production period. Trucks for normal production operations would use the existing and proposed access roads. Produced water would be transported to an approved disposal site. All traffic would be confined to approved routes and conform to established load restrictions and speed limits for state and BIA roadways and haul permits would be acquired as appropriate.

The EPA specifies chemical reporting requirements under Title III of the Superfund Amendments and Reauthorization Act (SARA), as amended. No chemicals subject to reporting under SARA Title III (hazardous materials) in an amount greater than 10,000 pounds would be used, produced, stored, transported, or disposed of annually in association with the Proposed Action. Furthermore, no extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities would be used, produced, stored, transported, or disposed of in association with the Proposed Action. All operations, including flaring, would conform to instructions from BIA fire management staff.

A temporary, lined cuttings pit would be constructed within the disturbed area of each well pad and constructed so as not to leak, break, or allow discharge and in a way that minimizes the accumulation of precipitation runoff into the pit.

Spills of oil, produced water, or other produced fluids would be cleaned up and disposed of in accordance with appropriate regulations. Sewage would be contained in a portable chemical toilet during drilling. All trash would be stored in a trash cage and hauled to an appropriate landfill during and after drilling and completion operations.

3.8.1 Potential Impacts to Public Health and Safety

With the implementation of the described reporting and management of hazardous materials, no adverse impacts to public health and safety are anticipated as a result of the proposed new wells. Other potential adverse impacts to any nearby residents from construction would be largely temporary. Noise, fugitive dust, and traffic hazards would be present for about 90 to

150 days (depending on the number of wells per pad) during construction, drilling, and well completion as equipment and vehicles move on and off the site, and then diminish sharply during production operations. If a well proved productive, one small pumper truck would visit the well once a day to check the pump. Bakken wells typically produce both oil and water at a high rate initially. Gas would be flared initially and intermittently, while oil and produced water would be stored on the well pad in tanks and then hauled out by tankers until the well could be connected to gathering pipelines. Up to four 400-barrel oil tanks and one 400-barrel water tank would be located on the pad inside a berm of impervious compacted subsoil. The berm would be designed to hold 110% of the capacity of the largest tank, plus one day's production.

3.9 SOCIOECONOMICS

3.9.1 Socioeconomic Analysis Area

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 their proximity to the proposed well locations and overlap with the Reservation could result in socioeconomic impacts. 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.

3.9.2 Population and Demographic Trends

Historic and current population counts for the Analysis Area, compared to the state, are provided below in

Table 3.11. 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 3.11, 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).

Table 3.11. Population and Demographics.

County or Reservation	Population in 2008	% of State Population	% Change Between 1990–2000	% Change Between 2000–2008	Predominant Group in 2008 (%)	Predominant Minority in 2008 (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 Indian Reservation[1]	11,897	1.8	178.0[2]	+13.3[3]	American Indian	Caucasian (~27%)
Statewide	641,481	100	0.005	-0.1	Caucasian	American Indian (8.6%)

Source: U.S. Census Bureau 2010a.

[1] 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 Indian 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.

[2] Bureau of Indian Affairs 2001. Reflects percent change between 1991 and 2001.

[3] Reflects percent change between 2001 and 2005.

3.9.3 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, 2007 economic data indicate that the major employers in North Dakota include government and government enterprises, which employed 16.6%; health care and social assistance, which employed 11.7%; and retail trade, which employed at 11.3% of the state's labor force (U.S. Bureau of Economic Analysis 2009a). Energy development and extraction, power generation, and services related to these activities have become increasingly important over the last several years and many service sector jobs are directly and indirectly associated with oil and gas development.

Table 3.12 provides data on 2009 employment opportunities for the Analysis Area, and changes in unemployment for the period between 2005 and 2009. All counties in the Analysis Area, and the entire state of North Dakota showed average weekly wages that were lower than the national average in 2009. In 2009, total employment in the state of North Dakota was approximately 354,916, with a statewide unemployment rate of 4.3% of the workforce, one of the lowest in the nation (Bureau of Labor Statistics 2009). While some counties in the

Analysis Area experienced a slight increase in unemployment, others were unchanged or experienced a decreased unemployment.

Table 3.12. 2009 Total Employment, Average Weekly Wages, and Unemployment Rates.

Location	Total Employment (September 2009)	Average Weekly Wage (September 2009)	Unemployment Rate (2009)	Change in Unemployment Rate (2005–2009)
United States	128,088,742	$840	9.8%	
North Dakota	354,916	$680	4.3%	**+0.9%**
Dunn County	929	$647	4.5%	**+1.1%**
McKenzie County	2,899	$839	3.5%	**-0.2%**
McLean County	3,594	$755	5.0%	**No change**
Mountrail County	3,126	$681	4.2%	**-1.8%**
On or Near Fort Berthold Indian Reservation*	1,287	N/A	71%	**N/A**

Sources: Bureau of Labor Statistics 2009; U.S. Department of Agriculture 2010; Bureau of Indian Affairs 2005.
* Represents 2005 data only.

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% (BIA 2005).

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.

3.9.4 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. As presented in Table 3.13, 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 3.13. Income and Poverty in Analysis Area, 2007.

Unit of Analysis	Per Capita Income[1]	Median Household Income	Percent of all People in Poverty[2]
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 Indian Reservation[3]	$10,291	$26,274	N/A

Unit of Analysis	Per Capita Income[1]	Median Household Income	Percent of all People in Poverty[2]
North Dakota	36,082	$43,936	11.8%

[1] U.S. Census Bureau 2010a
[2] U.S. Department of Agriculture 2010
[3] North Dakota State Data Center 2009

3.9.5 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, with 2008 updates (U.S. Census Bureau 2010a). 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 3.14 provides housing unit supply estimates in the Analysis Area, including the Reservation and four overlapping counties.

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.

Table 3.14. 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 2010a.

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 3.15.

Table 3.15. 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 2009a, 2009b.

3.9.6 Potential Impacts to Area Socioeconomics

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 3.16, implementation of the proposed wells is anticipated to require between 14 and 28 workers per well in the short term. If the wells prove successful, Enerplus 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 mixture of local and Enerplus employees would work in the project area. Therefore, any increase in workers would constitute a minor increase in population in the project area required for short-term operations and would not create a noticeable increase in demand for services or infrastructure on the Reservation or the communities near the project area.

Although the Analysis Area has experienced a recent decline in population between 2000 and 2008 (as shown in

Table 3.11), the population on the Reservation itself has increased. This has not led to significant housing shortages. The historic housing vacancy rate (Table 3.14) indicates that housing has remained available despite the growth of the population on the Reservation. The levels of available housing are therefore anticipated to be 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 project area.

Table 3.16. 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 Dunn County 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.

3.10 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 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 the Order.

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 3.17 summarizes relevant data regarding minority populations for the Analysis Area.

Table 3.17. Minority Population Breakdown by North Dakota County and Race, 2000–2008.

Race	Dunn		McKenzie		McLean		Mountrail		North Dakota	
	2000	2008	2000	2008	2000	2008	2000	2008	2000	2008
Total Population	3,600	3,318	5,737	5,674	9,311	8,337	6,629	6,511	642,204	641,481
Non-Hispanic	3,573	3,275	5,679	5,581	9,230	8,191	6,542	6,327	634,418	628,254
Hispanic or Latino[1]	27	43	58	93	81	146	87	184	7,786	13,227
Races										
Caucasian	3,123	2,818	4,457	4,329	8,632	7,610	4,546	4,086	596,722	586,272
African American	1	2	4	30	2	9	7	27	4,157	6,956
American Indians and Alaska Natives	448	467	1,216	1,230	568	587	1,988	2,277	31,440	35,666
Asian / Pacific Islanders	8	3	4	10	12	19	17	20	3,912	5,095
Two or More Races	25	28	39	75	97	112	71	101	5,973	7,492
All Minorities	509	543	1,321	1,438	760	808	2,170	2,609	53,268	55,209
% Minority Population	14.1	16.4	23.0	25.3	8.2	9.7	32.7	40.1	8.3	8.6
Change in Minority Population (2000–2008)	+6.7%		+8.9%		+6.3%		+20.2%		+3.6%	

[1] Hispanic or Latino may be of any race.

[2] U.S. Census Bureau estimates of population demographics were made in July 2008.

Sources: U.S. Census Bureau 2010a.

In July 2008, the U.S. Census Bureau estimated that North Dakota's total minority population comprised approximately 55,209 persons, or 8.6% of the state's total population (i.e., 641,481 residents). This represents an increase of 3.63% over the 2000 minority population of the state, even though the overall state's total population decreased during the same time. An even stronger trend of increased minority population, and decrease in overall population occurred in the Analysis Area during the same time period. As presented in Table 3.17, the number of Caucasian residents decreased, while minorities in nearly all categories increased, producing a strong increase in the percentage of minority population in each of the counties in

the Analysis Area during the period from 2000 until 2008 (U.S. Census Bureau 2010a). The four counties of the Analysis Area showed an increase of 6.3% to 20.2% in minority population, compared with the statewide increase of 3.6%.

In 2008, the counties in the Analysis Area had a higher percentage of American Indian and Alaska Natives, ranging from 7.0% in McLean County to nearly 35% in Mountrail County, compared with the state as a whole which had approximately 5.6% in this category (U.S. Census Bureau 2010a). The North Dakota Indian Affairs Commission (NDIAC) reports that American Indian population (race alone or in combination) in North Dakota has increased 12% from 35,228 in 2000 to 35,666 in 2008 (U.S. Census Bureau 2010a), with estimates for the future American Indian population (one race only) will be 47,000 in 2015 and 59,000 in 2025 in North Dakota (NDIAC 2010). Fort Berthold Indian Reservation has a total population of 5,915 in the 2000 census, with 67.4 % American Indian, mostly with tribal affiliations with MHA Nation (NDIAC 2010).

Poverty rate data for the counties in the Analysis Area are summarized in Table 3.18. The data show that poverty rates have decreased in the Analysis Area during the period from 2000 to 2008 (U.S. Census Bureau 2010b). However, except for McLean County, the poverty rates are higher and the median household incomes are lower for area residents in 2008, compared with the statewide poverty rate of 11.5% and median household income of $45,995.

Table 3.18. Poverty Rates and Median Household Income for the Analysis Area.

Location	2000	2008	2008 Median Household Income
Dunn County	13.3%	12.2	$40,801
McKenzie County	15.7%	14.4	$44,704
McLean County	12.3%	11.1	$46,131
Mountrail County	15.7%	14.0	$41,551
North Dakota	10.4%	11.5%	$45,996

Source: U.S. Census Bureau 2010b.

3.10.1 Potential Impacts to Environmental Justice

The Analysis Area, having larger and increasing minority populations, compared with statewide numbers, could result in disproportionately beneficial impacts from the proposed oilfield development. These would derive from direct and indirect economic opportunities for tribal members. 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. Poverty rates in the Analysis Area have already begun to decrease since oil and gas development began after 2000, as shown in Table 3.18. There is potential for adverse economic impacts to tribal members who do not reside within the Reservation and therefore do not share in direct or indirect benefits.

Potential adverse impacts could occur to tribes and tribal members, as well, such as the potential disturbance of any TCPs and cultural resources. These potential impacts are reduced through surveys of proposed well locations and access road routes, mitigation measures required by the BIA, and thorough reviews and determinations by the BIA that there would be no effect to historic properties. The possibility of disproportionate impacts to tribes or tribal members is further reduced by the requirement 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.

3.11 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 would 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 would be developed by the BLM and BIA which documents the results of monitoring in order to adapt the projects to eliminate any adverse impact on the environment.

Mitigation opportunities can be found in general and operator-committed BMPs and mitigation measures. BMPs are loosely defined as techniques used to lessen the visual and physical impacts of development. The BLM has created a catalog of BMPs that, when properly implemented, can assist industry in a project's design, scheduling, and construction

techniques. Enerplus would implement, to the extent possible, the use of BMPs in an effort to mitigate environmental concerns in the planning phase allowing for smoother analysis, and possibly faster project approval. Many of these are required by the BLM when drilling federal or tribal leaseholds and can be found in the surface use plan in the APD.

3.11.1 General BMPs

Although largely project-specific, there are a number of BMPs that can, and should, be considered on development projects in general. The following are examples of general BMPs.

- Planning roads and facility sites to minimize visual impacts.
- Using existing roads to the extent possible, upgrading as needed.
- Reducing the size of facility sites and types of roads to minimize surface disturbance.
- Minimizing topsoil removal.
- Stockpiling stripped topsoil and protecting it from erosion until reclamation activities commence. At that time, the soil would be redistributed and reseeded on the disturbed areas. The reclaimed areas would be protected and maintained until the sites are fully stabilized.
- Avoiding removal of, and damage to, trees, shrubs, and groundcover where possible. Trees near construction areas would be marked clearly to ensure that they are not removed.
- Mowing, instead of clearing, a facility or well site to accommodate vehicles or equipment.
- Maintaining buffer strips or using other sediment control measures to avoid sediment migration to stream channels as a result of construction activities.
- Planning for erosion control.
- Storing chemicals in a proper manner (including secondary containment).
- Keeping sites clean, including containing trash in a portable trash cage. The trash cage would be emptied at a state-approved sanitary landfill.
- Conducting snow removal activities in a manner that does not adversely impact reclaimed areas and areas adjacent to reclaimed areas.
- Avoiding or minimizing topographic alterations, activities on steep slopes, and disturbances within stream channels and floodplains to the extent possible.
- Maintaining buffers around work areas where there is a risk of fire as a result of construction activities.
- Keeping fire extinguishers in all vehicles.
- Planning transportation to reduce vehicle density.
- Posting speed limits on roads.
- Avoiding traveling during wet conditions that could result in excessive rutting.

- Painting facilities a color (Shale) that would blend with the environment.
- Practicing dust abatement on roads.
- Recontouring disturbed areas to approximate the original contours of the landscape.
- Developing a final reclamation plan that allows disturbed areas to be quickly absorbed into the natural landscape.

Enerplus recognizes that there are several BMPs that can be used to mitigate environmental concerns specific to projects associated with below-ground linear alignments, such as those included in the proposed utility corridor. These include:

- following the contour (form and line) of the landscape;
- avoiding locating ROWs on steep slopes;
- sharing common ROWs;
- co-locating multiple lines in the same trench; and
- using natural (topography, vegetation) or artificial (berms) features to help screen facilities such as valves and metering stations.

Enerplus would implement these and/or other BMPs to the extent that they are technically feasible and would add strategic and measurable protection to the project area.

3.11.2 Mitigation and Safety Measures Committed to by Enerplus

3.11.2.1 Dust Control

During construction, a watering truck may be kept on site and the access roads would be watered as necessary, especially during periods of high winds and/or low precipitation.

3.11.2.2 Wildlife

As mentioned in Section 3.4.3, Potential Impacts to Wetlands, Habitat, and Wildlife, Enerplus has committed to using a semi-closed loop drilling system, ensuring that the cuttings pit would 1) be smaller than a typical pit, and 2) contain only dry cuttings, which would be solidified with fly ash and buried in place following completion of drilling operations. Additional protections committed to by Enerplus include the following.

- Consolidating well locations by designing multi-well pads to minimize disturbance and habitat fragmentation.
- Stopping work and notifying the BIA and USFWS if a whooping crane is sighted within 1 mile of the proposed project area.
- If construction is to take place outside the migratory bird breeding season (February 1–July 15) for the well pads in the SESW Section 12, NENW Section 11, and the NENW and NWNE Section 23, Enerplus would:

  - mow and maintain vegetation within the project construction area (access road and well pad) prior to and during the breeding season to deter migratory birds from nesting in the project area until construction is underway; or
  - conduct an ornithological survey of the project area five days before construction begins and contact the BIA and the USFWS if birds or nests are found.

- Lining all pits with a liner with a minimum thickness of 12 millimeters.
- Fencing all pits.
- Covering the pit with a nylon net if it contains fluid and active drilling is not occurring. A maximum mesh size of 1.5 inches will allow for snow loading and prevent most birds from entering the pit. The netting would be at least 5 feet from the surface fluids to prevent the mesh from sagging during heavy snow fall and/or high winds. The net would remain in place until final reclamation of the pit occurs.

3.11.2.3 Erosion Controls and Spill Prevention

- As described in Section 2.2.7, Commercial Production, an impervious dike sized to hold , plus one day's production, of the capacity of the largest tank would be constructed around the tank battery. 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.
- Topsoil would be placed to divert flow away from well pad locations to limit the possibility of surface contamination.
- Two-foot berms would be constructed around the two-well pad in the SESW of Section 12, T148N, R94W, and appropriate BMPs would be in place to reduce impacts to the intermittent/perennial stream.
- Matting would be laid and/or hydroseeding would take place on the cut side of the two-well pad in the SESW of Section 12, T148N, R94W.
- If trees and other woody material are to be removed from any of the proposed well pads, they would be ground and added to the topsoil.
- A drainage ditch would be constructed on the south side of the four-well pad in the NENW of Section 11, T148N, R94W.
- As described in Section 2.2.9.1, Interim Reclamation, all disturbed areas that are not needed for operations after construction and drilling are complete would be revegetated.

3.11.2.4 Fire Control

Enerplus would implement fire prevention and control measures including, but not limited to:

- requiring construction crews to carry fire extinguishers in their vehicles and/or equipment;

- training construction crews in the proper use of fire extinguishers; and
- contracting with the local fire district to provide fire protection.

3.11.2.5 Traffic

Construction personnel would stay primarily within the ROW or would follow designated access roads.

3.11.2.6 Cultural Resources

The following protocol will be adhered to by all construction personnel during construction and maintenance of the well pad or access road.

- Five cultural sites identified near the well pads in Section 23 and in the NE of Section 11 will be fenced and a qualified archaeological monitor will be required to be present during all ground-disturbing activities to ensure that inadvertent impacts to cultural resources are avoided.
- All project workers are prohibited from collecting artifacts or disturbing cultural resources in any area under any circumstances.

If cultural resources are discovered during construction or operation, work shall immediately be stopped, the affected site be secured, and BIA and THPO notified. In the event of a discovery, work shall not resume until written authorization to proceed has been received from the BIA.

3.12 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 damaged cultural resources, wildlife killed as a result of collision with vehicles (i.e., construction machinery and work trucks), and energy expended during construction and operation.

3.13 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 would be properly compensated for the loss of land use. The initial disturbance area would decrease considerably once the wells are drilled and non-necessary areas have been reclaimed. Rapid reclamation of the project area would facilitate revived wildlife and livestock usage, stabilize the soil, and reduce the potential for erosion and sedimentation.

3.14 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 in the vicinity of 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 Enerplus 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.

One active well was found within 1 mile of the project area. There are 12, 76, and 434 oil and gas wells (active, confidential, and permitted, respectively) within 5, 10, and 20 miles, respectively, of the proposed project areas (Table 3.19 through Table 3.22, Figure 3.7).

Table 3.19. Confidential, Active, and Permitted Wells within a 1-mile Radius of the Project area.

	NWNE Section 11: Axe, Vise, Poblano, Cayenne		**NENW Section 11:** Anvil, Jalapeno, Habanero, Forge		**SWSE Section 12:** Pine, Cedar		**SESW Section 12:** Oak, Spruce		**NWNE Section 23:** Hawaii, Maui		**NENW Section 23:** Kona, Hilo	
Reservation (on/off)	on	off	on	off	on	off	on	off	on	off	on	off
Confidential Wells	1	0	0	0	1	0	2	0	2	0	2	0
Active Wells	0	0	0	0	1	0	1	0	5	0	4	0
Permitted Wells	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.20. Confidential, Active, and Permitted Wells within a 5-mile Radius of the Project area.

NWNE Section 11: Axe,	**NENW Section 11:** Anvil,	**SWSE Section 12:**	**SESW Section 12:**	**NWNE Section 23:**	**NENW Section 23:**

	Vise, Poblano, Cayenne		Jalapeno, Habanero, Forge		Pine, Cedar		Oak, Spruce		Hawaii, Maui		Kona, Hilo	
Reservation (on/off)	on	off	on	off	on	off	on	off	on	off	on	off
Confidential Wells	15	0	15	0	17	0	17	0	16	0	15	0
Active Wells	15	0	16	0	16	0	16	0	14	0	14	0
Permitted Wells	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.21. Confidential, Active, and Permitted Wells within a 10-mile Radius of the Project area.

	NWNE Section 11: Axe, Vise, Poblano, Cayenne		**NENW Section 11:** Anvil, Jalapeno, Habanero, Forge		**SWSE Section 12:** Pine, Cedar		**SESW Section 12:** Oak, Spruce		**NWNE Section 23:** Hawaii, Maui		**NENW Section 23:** Kona, Hilo	
Reservation (on/off)	on	off	on	off	on	off	on	off	on	off	on	off
Confidential Wells	56	2	56	4	51	3	51	3	48	6	48	15
Active Wells	45	0	45	2	44	1	44	2	44	11	44	3
Permitted Wells	1	0	1	0	1	0	1	0	1	0	1	0

Table 3.22. Confidential, Active, and Permitted Wells within a 20-mile Radius of the Project area.

	NWNE Section 11: Axe, Vise, Poblano, Cayenne		**NENW Section 11:** Anvil, Jalapeno, Habanero, Forge		**SWSE Section 12:** Pine, Cedar		**SESW Section 12:** Oak, Spruce		**NWNE Section 23:** Hawaii, Maui		**NENW Section 23:** Kona, Hilo	
Reservation (on/off)	on	off	on	off	on	off	on	off	on	off	on	off
Confidential Wells	119	83	116	83	119	87	115	87	105	95	105	96
Active Wells	90	281	89	285	82	266	81	271	76	289	76	290
Permitted	2	2	2	2	2	2	2	2	2-	2	2	2

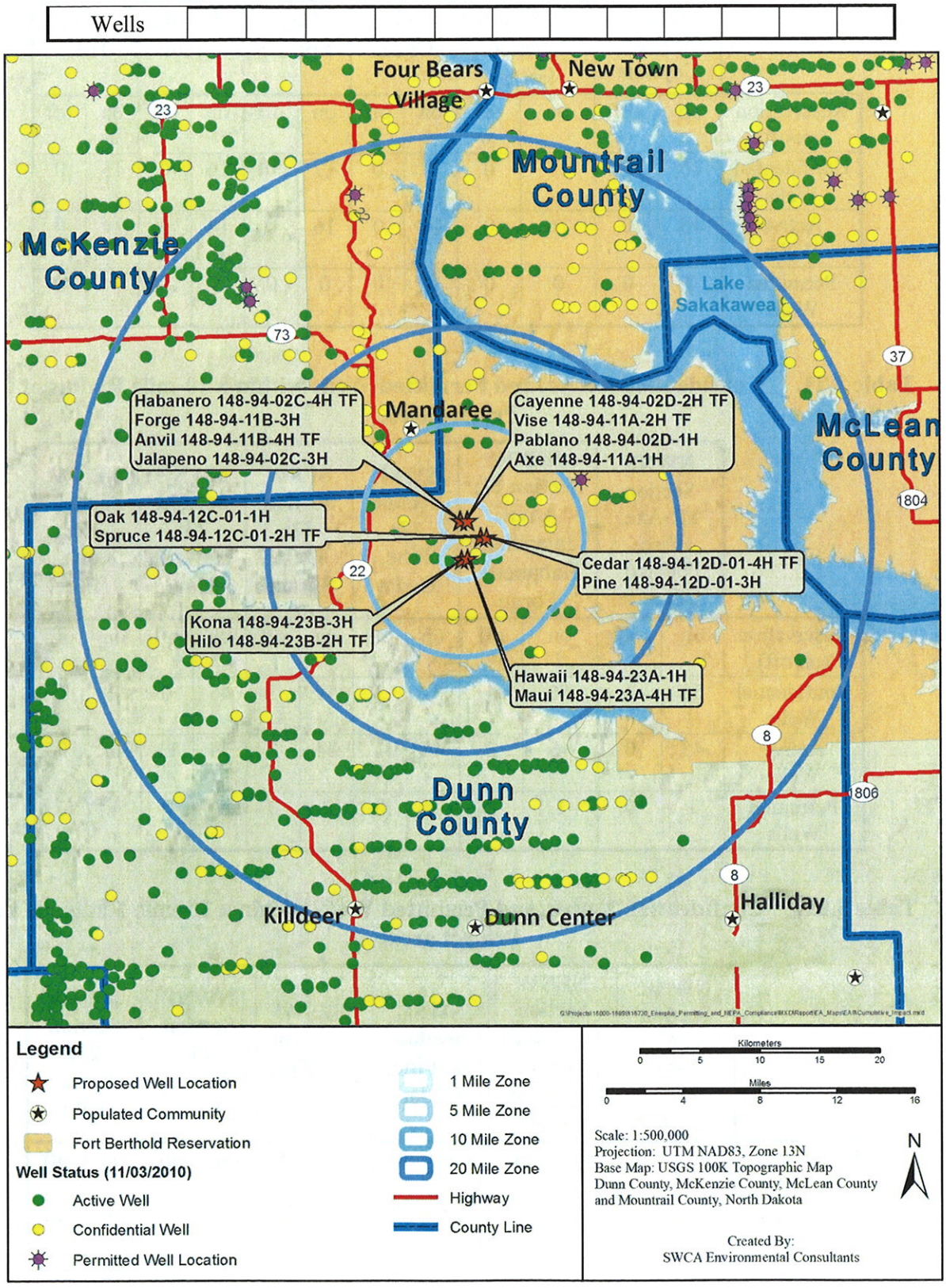


Figure 3.7. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the proposed project locations.

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. Enerplus has suggested, but not yet formally proposed, that potentially 74 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.

Potential cumulative impacts of the proposal plus other foreseeable future oil and gas development on the Reservation could include habitat fragmentation from construction of other well pads and roads, with potential effects on migratory grassland birds. The project would generate new long-term disturbance of approximately 31.7 acres of grassland habitat during the construction of roads and well pads, out of a total 804,244 acres within a 20-mile radius of the project. Similar levels of disturbance have occurred at 400 existing wells within the 20-mile radius, as indicated above. This level of development is estimated to have disturbed approximately 4,000 acres (10 acres per well), or approximately 0.5% of the available surface area within the 20-mile radius. The project would result in an estimated relative incremental increase of 0.8% when added to the existing surface disturbance.

It is anticipated that the pace and level of oil and gas development within this region of the state would 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 within the region. In general, however, the increase in emissions associated with the Proposed Action would occur predominantly during construction and drilling operations and would therefore 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 Upper Moccasin Creek subwatershed, but increases in degradation would be reduced by Enerplus'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, Enerplus 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, planting cover crops to stabilize soil following

construction and before permanent seeding takes place. Additional information regarding BMPs can be found in Section 3.11, Mitigation and Monitoring.

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 within 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, as 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 16 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. Enerplus 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 4.1). For the purpose of this EA, a stakeholder is considered any agency, municipality, or individual person to which 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 would be submitted to all cooperating federal agencies and also to those agencies with interests in or near the proposed actions that could be affected by those actions.

Table 4.1. Scoping Comments.

Name	Organization	Comment	Response to Comment
Bagley, Lonny	Bureau of Land Management	No Comment	
Benson, Barry	Three Affiliated Tribes	No Comment	
Bercier, Marilyn	Bureau of Indian Affairs	No Comment	
Berg, George	NoDak Electric Cooperative, Inc.	No Comment	
Black, Mike	Bureau of Indian Affairs	No Comment	
Boyd, Bill	Midcontinent Cable Company	No Comment	
Brady, Perry	THPO, Three Affiliated Tribes	No Comment	
Brien, David	Chairman, Turtle Mountain Band of Chippewa	No Comment	
Brugh, V. Judy	Three Affiliated Tribes	No Comment	
Cayko, Richard	McKenzie County	No Comment	
Christenson, Ray	Southwest Water Authority	No Comment	
Cimarosti, Dan	U.S. Army Corps of Engineers	Submit a Section 10 permit application if needed.	Section 10 permit not needed.
U.S. Army Corps of Engineers, Omaha District	Garrison Project Office	No Comment	
Danks, Marvin	Fort Berthold Rural Water Director	No Comment	
Dhieux, Joyce	U.S. Environmental Protection Agency	No Comment	
Director, Insurance & Hazard	Federal Emergency Management Agency	David Kyner: Major concern is whether or not project is located within a mapped Special Flood Hazard Area.	Project area is not in a flood hazard area. Please see Section 3.3, Water Resources.
Dixon, Doug	Montana Dakota Utilities	No Comment	
Erickson, Carroll	Ward County Board of Commissioners	No Comment	
Flores, J.R.	U.S. Department of Agriculture	No Comment	
Fox, Fred	Three Affiliated Tribes	No Comment	
Glatt, David	North Dakota Department of Health	Impacts minor and can be controlled by using proper construction methods.	See Sections 2.2.8, Construction Details at Individual Sites, and 3.11, Mitigation and Monitoring, for site-specific details and BMPs.
Gorton, Candace	U.S. Army Corps of Engineers	No Comment	
Guzman, Frank	U.S. Forest Service	No Comment	

Name	Organization	Comment	Response to Comment
Hall, Todd	Three Affiliated Tribes	No Comment	
Hanson, Jesse	North Dakota Parks and Recreation	No historic plant or animal species are known to occur within one mile. During reclamation, we recommend that the area be revegetated with native species.	See Sections 2.2.9, Reclamation, 3.4, Wetlands, Habitat, and Wildlife, 3.6, Vegetation and Invasive Species, and 3.11, Mitigation and Monitoring for more information.
Hauck, Reinhard	Dunn County	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	
Jarski, Tim	Reservation Telephone Cooperative	RTC has a 12-pair telephone cable in the SESE of Section 11 (148/94). Call with questions or concerns.	Enerplus would perform a line locate prior to construction.
Johnson, Harley	New Town Municipal Airport	No Comment	
Kadrmas, Ray	Dunn County	No Comment	
Kuehn, John	Parshall-Hankins Field Airport	No Comment	
Kulas, Cheryl	Indian Affairs Commission	No Comment	
Land Department	Northern Border Pipeline Company	No Comment	
Laux, Eric	U.S. Army Corps of Engineers	Brad Thompson: Coordinate with the EPA, USFWS, NDGF, SHPO. Consult the floodplain management office.	Necessary consultations have, or will be, made.
Lindemann, Larry	Airport Manager, Barnes County Municipal Airport	No Comment	
Manager	Xcel Energy	No Comment	
McKenna, Mike	North Dakota Game and Fish Department	Avoid construction to the extent possible within native prairie, wooded draws, riparian corridors, and wetland areas.	See Affected Environment, Section 3.4, Wetlands, Habitat, and Wildlife.

Name	Organization	Comment	Response to Comment
Mercer County	Mercer County Board of Commissioners	No Comment	
Missile Engineer, Chief	Minot Air Force Base	No Comment	
NAGPRA Office	Three Affiliated Tribes	No Comment	
Nash, Mike	Bureau of Land Management	No Comment	
Natural Resources Department	Three Affiliated Tribes	No Comment	
Nelson, Richard	U.S. Bureau of Reclamation	Ronald Melhouse: Project components would affect BOR facilities (rural water pipelines). Please review enclosed map for potential adverse effects and proper pipeline crossing, should that be necessary. Coordinate with the FBIR Rural Water director.	See Section 2.2.2, Access Roads and Utility Corridors. Enerplus would consult with the Rural Water Director if the project components should come into contact with any BOR rural water lines.
Dressler, Patricia	Federal Aviation Administration	No Objections	Thank you for your comment.
Olson, Frances	McKenzie County	No Comment	
Paaverud, Merl	State Historical Society	Send copy of reports and forms to keep archives current. Consider putting TCP-related info in separate reports not sent to SHPO.	Reports will be sent to the required agencies. See Section 3.7, Cultural Resources.
Packineau, Mervin	Three Affiliated Tribes	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	Three Affiliated Tribes	No Comment	
Prchal, Doug	North Dakota Parks and Recreation Department	No Comment	
Representative, Mandaree Segment	Three Affiliated Tribes	No Comment	
Rudolph, Reginald	McLean Electric Cooperative, Inc.	No Comment	
Schelkoph, David	West Plains Electric Cooperative, Inc.	No Comment	

Name	Organization	Comment	Response to Comment
Selvage, Michael	Chairman, Sisseton-Wahpeton Sioux Tribe	No Comment	
Sorenson, Charles	U.S. Army Corps of Engineers	Due to the close proximity to the Missouri River/Lake Sakakawea, please consider constructing a catch trench on the down-sloping side of the pad to contain hazardous wastes. Please consider a closed-loop drilling system. Additional weed-free fill material should be obtained from a supplier. Do not allow surface occupancy within ½ mile of any known T&E species habitat.	See Section 2.2.8, Construction Details, for information regarding berms. Enerplus uses the semi-closed loop system with a pit for cuttings only as a matter of practice. No additional fill material is required. NSO would be allowed within 0.5 mile of any known T&E habitat.
Svoboda, Larry	U.S. Environmental Protection Agency	No Comment	
Sweeney, Paul	Natural Resources Conservation Service	FPPA does not apply, no further action is needed. Avoid impacts to wetlands.	Thank you for your comment. See Section 3.4, Wetlands, Habitat, and Wildlife.
Thorson, Gary	McKenzie Electric Cooperative	No Comment	
Towner, Jeffrey	U.S. Fish and Wildlife Service	The Service concurs with determinations in scoping letter; Enerplus' commitments offer sufficient protection for T&E species, migratory birds, and bald/golden eagles.	Please see Sections 3.4.2, 3.4.2, and 3.11.2.2.
Chevance, Nick	National Park Service, Midwest Region	No Comment	
Vodehnal, Dale	U.S. Environmental Protection Agency	No Comment	
Wells, Marcus	Chairman, Three Affiliated Tribes	No Comment	
Whitcalf, Frank	Three Affiliated Tribes	No Comment	
Williams, Damon	Three Affiliated Tribes	No Comment	
Wolf, Malcolm	Three Affiliated Tribes	No Comment	

5.0 LIST OF PREPARERS

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

Enerplus Resources (USA) Corporation

- David Ramsden-Wood, U.S. Business Unit Manager
- Blane Thingelstad, Petroleum Engineer

SWCA Environmental Consultants

- Joey Sheeley, Project Manager/Planning Specialist
  Prepared the EA.
- Joshua Ruffo, Wildlife Biologist
  Conducted natural resource surveys for well pads and access roads.
- Alan Hutchinson, Archaeologist
  Conducted cultural resource surveys and prepared cultural resource reports for well pads and access roads.
- Claudia Oakes, Senior Environmental Planner
  Reviewed and edited the EA.
- Todd Kohler, Archaeologist
  Conducted cultural resource surveys and prepared cultural resource reports for well pads and access roads.
- Wade Epperson, GIS Specialist
  Created maps and spatially-derived data.
- Matt Spann, Environmental Specialist
  Completed water resources, soils, and vegetation sections.

6.0 REFERENCES

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

DEC 10 2010

Laura Leslie Burckhardt, Ecologist
SWCA Environmental Consultants
1892 South Sheridan Avenue
Sheridan, Wyoming 82801

Re: Enerplus 16 proposed oil and gas wells on 6 pads, Fort Berthold Reservation, Dunn County, North Dakota

Dear Ms. Burckhardt:

This is in response to your November 10, 2010, scoping letter and subsequent December 6, 2010, email correspondence with Heidi Riddle of my staff, on the proposed construction of 16 exploratory oil and gas wells, located on six well pads, to be completed by Enerplus Resources (USA) Corporation (Enerplus) on the Fort Berthold Reservation, Dunn County, North Dakota.

Specific locations for the proposed pads are:

Habanero 148-94-02C-4H TF, Anvil 148-94-11B-4H TF, Forge 148-94-11B-3H, Jalapeno 148-94-02C-4H TF: T. 148 N., R. 94 W., Section 11

Cayenne 148-94-02D-2H TF, Vise 148-94-11A-2H TF, Poblano 148-94-02D-1H, Axe 148-94-11A-11H: T. 148 N., R. 94 W., Section 11

Spruce 148-94-12C-01-2H TF, Oak 148-94-1C-01-1H: T. 148 N., R. 94 W., Section 12

Cedar 148-94-12D-01-4H TF, Pine 148-94-12D-01-3H: T. 148 N., R. 94 W., Section 12

Hilo 148-94-23B-2H TF, Kona 148-94-23B-3H: T. 148 N., R. 94 W., Section 23

Hawaii 148-94-23A-1H, Maui 148-94-23A-4H TF: T. 148 N., R. 94 W., Section 23

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).

Threatened and Endangered Species

In an e-mail dated October 13, 2009, the Bureau of Indian Affairs (BIA) designated SWCA Environmental Consultants (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 for the purposes of ESA, and under our other authorities as the entity preparing the NEPA document for adoption by the BIA.

The Service concurs with your "may affect, is not likely to adversely affect" determination for piping plover, interior least tern, and pallid sturgeon, and designated critical habitat for piping plover. The proposed location for the six well pads is approximately 15.4 and 19.3 miles from nesting locations and habitat on Lake Sakakawea and designated critical habitat for the piping plover. Additionally, Enerplus has committed to constructing two-foot berms around the Spruce/Oak well pad. This pad is positioned near a wooded draw.

The Service concurs with your "may affect, is not likely to adversely affect" determination for whooping cranes. This concurrence is predicated on Enerplus's commitment to stop work on the proposed site if a whooping crane is sighted within one mile of the proposed project area and immediately contacting the Service. Work may resume in coordination with the Service once the bird(s) have left the area.

The Service acknowledges your "no effect" determination for gray wolf and black-footed ferret.

The Dakota skipper and Sprague's pipit are candidate species for listing under the ESA; therefore, an effects determination is not necessary for these species. 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.

Migratory Birds

Enerplus has committed to implementing the following measures:

- Construction will be done outside of the migratory bird nesting season (Feb. 1-July 15);

- Or, conduct a bird/nest survey within five days prior to construction and report any findings to the Service;
- Or, mow grassy areas to reduce nesting potential.

Bald and Golden Eagles

Your letter states that the nearest documented golden eagle nest is located 3.4 miles away and that no eagle nests were observed within 0.5 mile of the project area during line of sight surveys conducted on August 24th and 25th, 2010.

The Service believes that Enerplus's commitment to implement the aforementioned measures does demonstrate compliance with the MBTA and the BGEPA.

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

Sincerely,

Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

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

United States Department of the Interior

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

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
DESCRM
MC-208

DEC 2 7 2010

Elgin Crows Breast, THPO
Mandan, Hidatsa and Arikara Nation
404 Frontage Road
New Town, North Dakota 58763

Dear Mr. Crows Breast:

We have considered the potential effects on cultural resources of two proposed dual oil well pads and access roads in Dunn County, North Dakota. Approximately 32.06 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the areas depicted in the enclosed reports. Three archaeological sites (32DU1545, 32DU1546, 32DU1547) were 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, as the archaeological sites will be avoided. Catalogued as **BIA Case Number AAO-1799/FB/10,** the proposed undertakings, locations, and project dimensions are described in the following reports:

Fewings, Natalie, and Todd Kohler
(2010a) A Class I and Class III Cultural Resource Inventory of the Hilo and Kona Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for Enerplus Resources, Denver.

(2010b) A Class I and Class III Cultural Resource Inventory of the Hawaii and Maui Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for Enerplus Resources, Denver.

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,

ACTING Regional Director

Enclosures

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

United States Department of the Interior

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

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
DESCRM
MC-208

NOV 0 3 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 a proposed quadruple oil well pad and access road in Dunn County, North Dakota. Approximately 21 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. No historic properties were located that appear to 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-1799/FB/10,** the proposed undertaking, location, and project dimensions are described in the following report:

Kohler, Todd
(2010) A Class I and Class III Cultural Resource Inventory of the Enerplus Resources Habanero, Anvil, Forge and Jalapeno Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for Enerplus Resources, Denver.

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

Enclosure

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

United States Department of the Interior

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

TAKE PRIDE IN AMERICA

NOV 24 2010

IN REPLY REFER TO:
DESCRM
MC-208

Elgin Crows Breast, THPO
Mandan, Hidatsa and Arikara Nation
404 Frontage Road
New Town, North Dakota 58763

Dear Mr. Crows Breast:

We have considered the potential effects on cultural resources of a proposed dual oil well pad and access road in Dunn County, North Dakota. Approximately 13.7 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. No historic properties were located that appear to 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-1799/FB/10,** the proposed undertaking, location, and project dimensions are described in the following report:

Fewings, Natalie
(2010) A Class I and Class III Cultural Resource Inventory of the Enerplus Resources Oak and Spruce Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for Enerplus Resources, Denver.

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,

ACTING Regional Director

Enclosure

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

United States Department of the Interior

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

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
DESCRM
MC-208

DEC 16 2010

Elgin Crows Breast, THPO
Mandan, Hidatsa and Arikara Nation
404 Frontage Road
New Town, North Dakota 58763

Dear Mr. Crows Breast:

We have considered the potential effects on cultural resources of a proposed quadruple oil well pad and access road in Dunn County, North Dakota. Approximately 39.2 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. One archaeological site (32DU1548) 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, as the access road has been rerouted and the site will be fenced off. Catalogued as **BIA Case Number AAO-1799/FB/10,** the proposed undertaking, location, and project dimensions are described in the following report:

Hutchinson, Alan, and Todd Kohler
(2010) A Class I and Class III Cultural Resource Inventory of the Cayenne, Poblano, Vise and Axe Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for Enerplus Resources Corporation, Denver.

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

Enclosure

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

United States Department of the Interior

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

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
DESCRM
MC-208

DEC 2 7 2010

Elgin Crows Breast, THPO
Mandan, Hidatsa and Arikara Nation
404 Frontage Road
New Town, North Dakota 58763

Dear Mr. Crows Breast:

We have considered the potential effects on cultural resources of a proposed dual oil well pad and access road in Dunn County, North Dakota. Approximately 27 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. No historic properties were located that appear to 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-1799/FB/10,** the proposed undertaking, location, and project dimensions are described in the following report:

Fewings, Natalie, and Todd Kohler
(2010) A Class I and Class III Cultural Resource Inventory of the Cedar and Pine Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for Enerplus Resources, Denver.

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,

ACTING Regional Director

Enclosure

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

Notice of Availability and Appeal Rights

Enerplus: Axe 148-94-11A-1H. Vise 148-94-11A-2H TF, Poblano 148-94-02D-1H, Cayenne 148-94-02D-2H TF
Anvil 148-94-11B-4H TF, Jalapeno 148-94-02C-3H, Habanero 148-94-02C-4H TF, Forge 148-94-11B-3H
Pine 148-94-12D-01-3H, Cedar 148-94-12D-01-4H TF, Oak 148-94-12C-01-1H, Spruce 148-94-12C-01-2H TF
Hawaii 148-94-23A-1H, Maui 148-94-23A-4H TF, Kona 148-94-23B-3H, Hilo 148-94-23B-2H TF

The Bureau of Indian Affairs (BIA) is planning to issue administrative approvals related to installation of eight well pads and up to 16 oil/gas wells on six pads as shown on the attached map. Construction by Enerplus is expected to begin in 2011.

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 March 10, 2011, 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.