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 06 2010

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 five proposed exploratory drilling wells by Petro-Hunt on the Fort Berthold Reservation, an Environmental Assessment (EA) has been completed and a Finding of No Significant Impact (FONSI) has been issued.

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

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

Attachment

cc: 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
Petro-Hunt, LLC

Five Bakken Exploratory Oil Wells:

Fort Berthold #148-95-24C-13-1H
Fort Berthold #148-95-25B-36-1H
Fort Berthold #148-95-26A-35-1H
Fort Berthold #148-95-23D-14-1H
Fort Berthold #148-95-3A-10-1H

Fort Berthold Indian Reservation
Dunn County, North Dakota

The U.S. Bureau of Indian Affairs (BIA) has received a proposal for five oil/gas wells, access roads and related infrastructure on the Fort Berthold Indian Reservation to be located in SW¼ SW¼, Section 24, Township (T) 148 North (N), Range (R) 95 West (W), Dunn County, North Dakota, SE¼ SE¼, Section 23, T148N, R95W, Dunn County, North Dakota, and NE¼ NE¼, Section 3, T148N, R95W, Dunn County, North Dakota. Associated federal actions by BIA include determinations of effect regarding cultural resources, approvals of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Applications for Permit to Drill.

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

This determination is based on the following factors:

1. Agency and public involvement was solicited and environmental issues related to the proposal were identified.

2. Protective and prudent measures were designed to minimize impacts to air, water, soil, vegetation, wetlands, wildlife, public safety, water resources, and cultural resources. The remaining potential for impacts was disclosed for both the proposed action and the No Action alternative.

3. Guidance from the U.S. Fish and Wildlife Service has been fully considered regarding wildlife impacts, particularly in regard to threatened or endangered species. 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.

Regional Director

12/6/10
Date

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 State Office
Dickinson, North Dakota

Petro-Hunt, LLC

Five Bakken Exploratory Oil Wells:

Fort Berthold #148-95-24C-13-1H
Fort Berthold #148-95-25B-36-1H
Fort Berthold #148-95-26A-35-1H
Fort Berthold #148-95-23D-14-1H
Fort Berthold #148-95-3A-10-1H

Fort Berthold Indian Reservation

November 2010

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

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

Petro-Hunt, LLC (Petro-Hunt) has acquired the leases and is proposing to drill five horizontal oil and gas wells on the Fort Berthold Indian Reservation (Reservation) to evaluate, and possibly develop, the commercial potential of natural resources. Four of the proposed wells will be drilled from two dual pads and one well will be drilled from a single pad. The development has been proposed on land 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 land and individual allotments. The BIA manages lands held in title by the tribe and tribal members to subsurface mineral rights. Developments have been proposed in locations that target specific areas within the Middle Bakken Dolomite member of the Bakken Formation, a known oil reserve. The following proposed oil wells, shown in Figure 1, will be located within the Reservation in which the majority of the external boundaries are located above the Bakken Formation (Figures 2 and 3).

- **Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H**: SW¼ SW¼, Section 24, Township (T) 148 North (N), Range (R) 95 West (W), Dunn County, North Dakota
- **Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H:** SE¼ SE¼, Section 23, T148N, R95W, Dunn County, North Dakota
- **Fort Berthold #148-95-3A-10-1H:** NE¼ NE¼, Section 3, T148N, R95W, Dunn County, North Dakota

Existing access roads will be upgraded and new access roads will be constructed to facilitate the construction and operation of each proposed well. The well pads will be constructed to accommodate drilling activities and well operations. The dual pads will use a semi-closed loop system and the single well pad will use open pits. All pits which utilize semi-closed loop systems will be constructed for semi-dried cuttings only. Free fluids found in the reserve pit for semi-closed loop systems should be immediately removed. The constructed pits will be reclaimed once drilling operations have ceased.. Should any of the proposed well sites result in long-term commercial production, supporting facilities may be constructed on site. All components (e.g., roads, well pads, supporting facilities) will be reclaimed upon final abandonment unless formally transferred with federal approval to either the BIA or the landowner. The proposed wells are exploratory; should they prove productive, further exploration of surrounding areas is possible. This environmental assessment (EA) addresses the potential impacts associated with the construction and possible long-term operation of the above-listed wells and directly related infrastructure and facilities. Further oil and gas exploration and development will require additional National Environmental Policy Act (NEPA) analysis and federal actions.

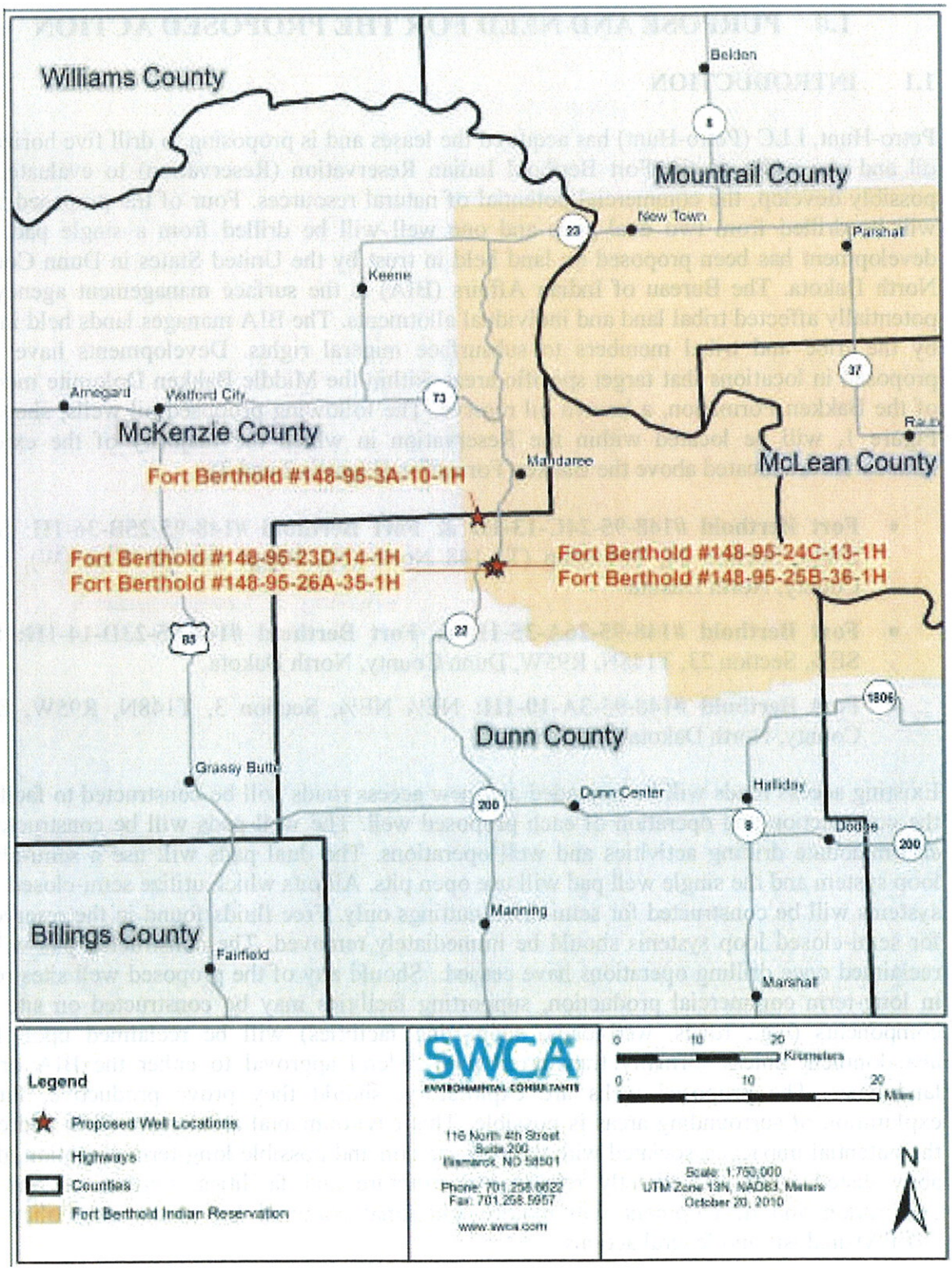


Figure 1. Location of the proposed project areas in Dunn County, North Dakota.

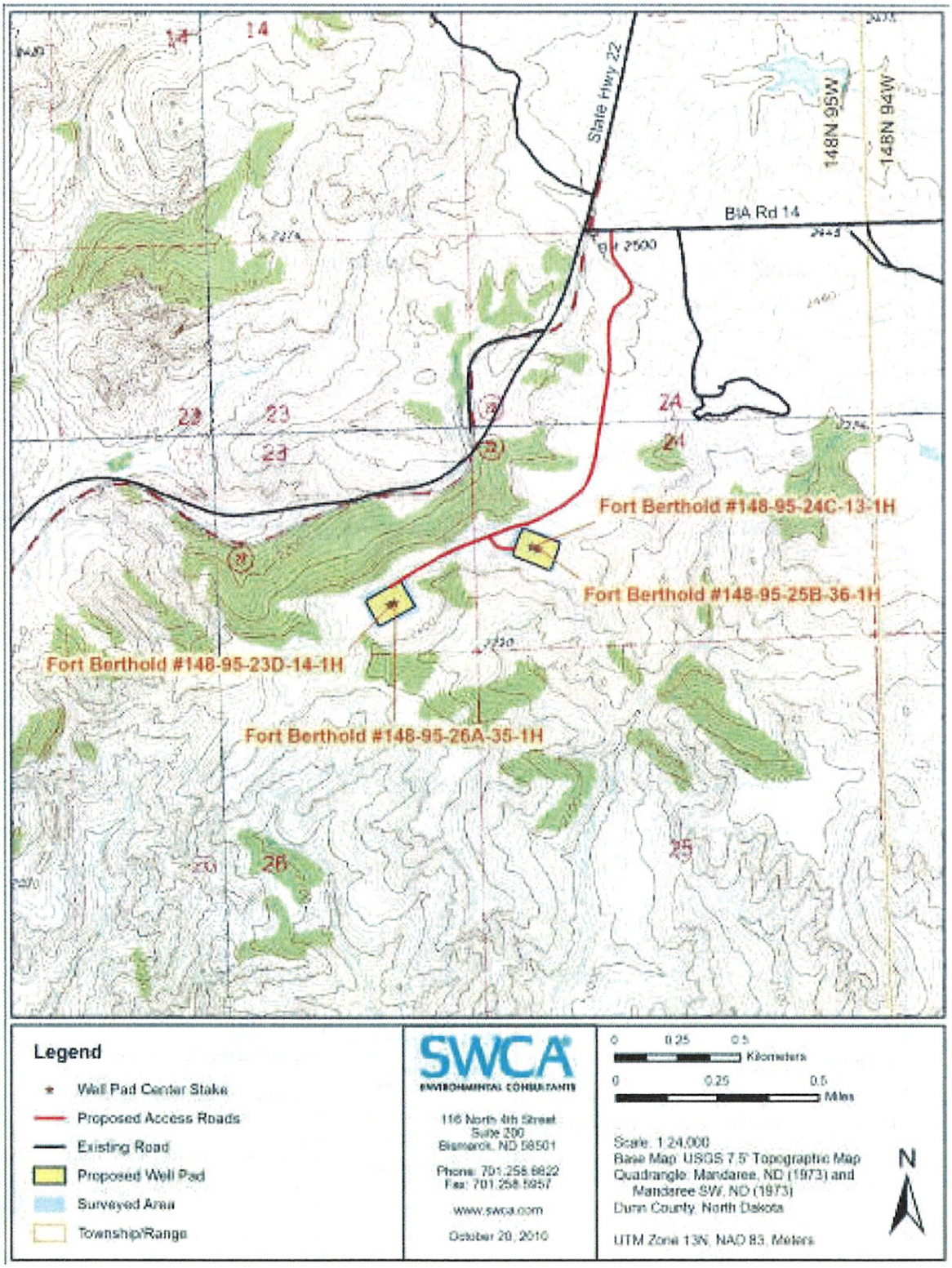


Figure 2. Proposed dual well pad locations with proposed access road.

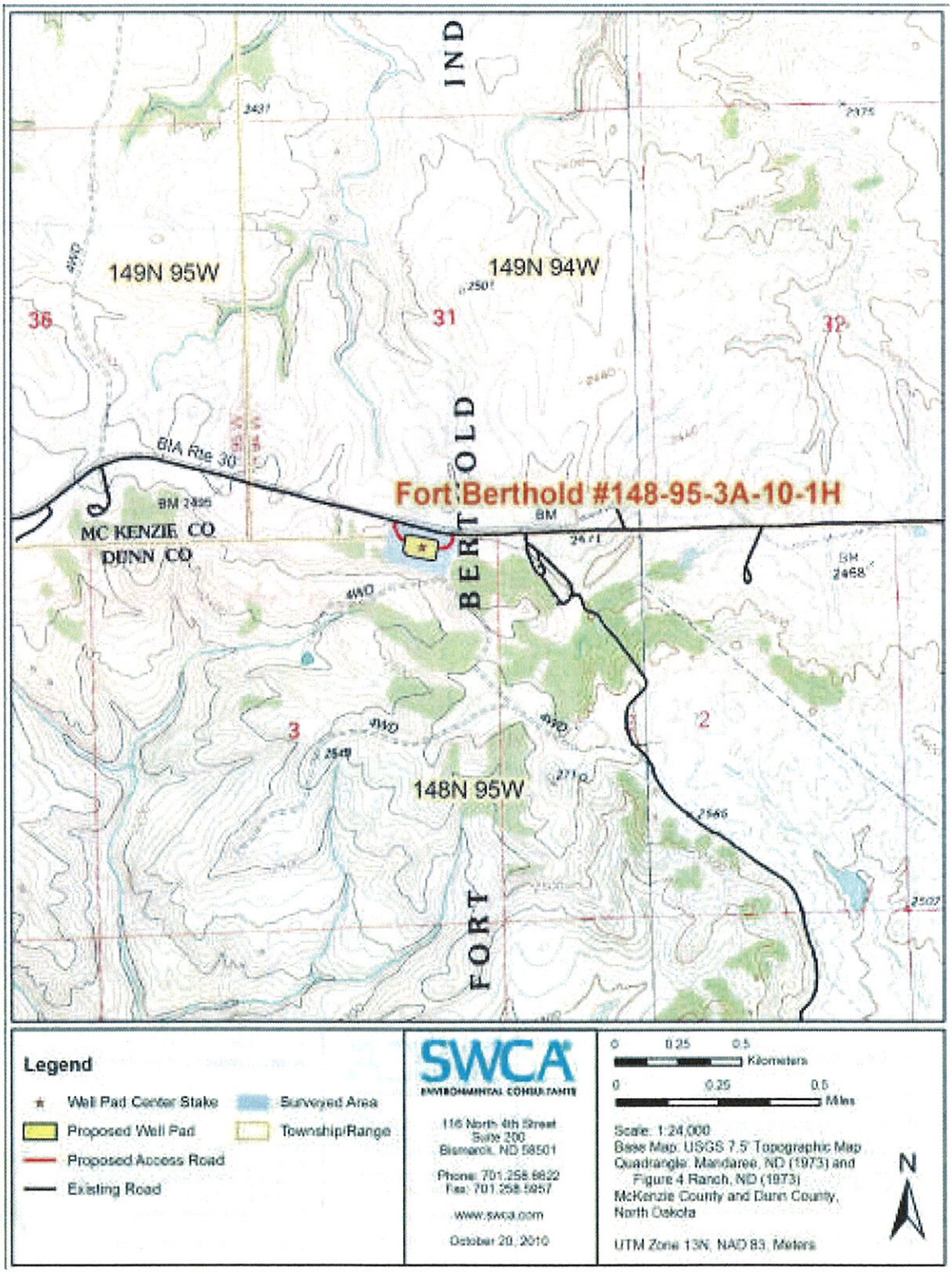


Figure 3. Proposed well location for single well pad.

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 individual tribal members. All members of the MHA Nation, including individual allotment owners, may benefit economically from the development of oil and gas exploration on the Reservation. Oil and gas exploration and subsequent development are covered 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 involvement with the proposed project includes approving easements, leases, and rights-of-way (ROWs); determining potential effects on cultural resources; and making recommendations to the Bureau of Land Management (BLM).

Compliance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality regulations (CEQ) (40 CPR 1500–1508), Title 43 Code of Federal Regulations (CFR) 3100, and Onshore Oil and Gas Order Nos. 1, 2, 6, and 7 is required due to the project's location on lands held in trust by the federal government. 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.

Compliance with Section 10 of the Rivers and Harbors Act (33 USC 403) is required when impacting navigable waters of the United States (which includes work over, under, or in such waters). The proposed Fort Berthold #148-95-26A-35-1H well will pull minerals from under the Little Missouri River, which is considered a navigable waterway. The U.S. Army Corps of Engineers requires that an Application for Department of the Army Permit (33 CFR 325) be submitted. The Department of the Army will determine if a permit is required.

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

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

1.3 ON-SITE REVIEW OF TRUST RESOURCES

The locations of each well pad and associated access roads were selected through consultation with tribal and BIA resource managers in order to eliminate the potential for impact to trust resources. EA on-site meetings for the both dual well pads were conducted on May 11, 2010. The field survey of the single well pad was completed on May 12, 2010. The access road leading to the dual well pads was surveyed on June 25, 2010. The on-site meetings were attended by a member of Petro-Hunt, a land surveyor, natural and cultural resource specialists, a BIA representative, and a Tribal Historic Preservation Office (THPO) monitor. Surveys were conducted to identify and subsequently mitigate the affect of the proposed action on cultural, archaeological, and natural (i.e., biological and physical) resources. Additionally, topography, pollutant transport via drainage features, erosion control measures, as well as pad and related facility locations (topsoil/subsoil stockpiles, reserve pits, tanks, etc.) were assessed.

1.4 PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

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

1.5 THE NO ACTION ALTERNATIVE

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

1.6 THE PROPOSED ACTION

This document analyzes the potential impacts of five exploratory oil and gas wells with varied surface and mineral estates located in the southwest portions of the Reservation in Dunn County. Sites were chosen by Petro-Hunt in consultation with tribal and BIA resource managers to provide information for future development. Well site locations underwent a pre-

clearance process that included surveys for cultural, archaeological, and natural (i.e., biological and physical) resources. The proposed wells would test the commercial potential of the Middle Bakken Dolomite member of the Bakken Formation.

1.6.1 Field Camps

A few personnel would be housed in self-contained trailers for a very short period of time. Long-term housing is not 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 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.

1.6.2 Access Roads and Utility Corridors

New roads are proposed to allow for access for well construction and production activities. Details of road construction are addressed in the APD and available upon request from the BIA. Up to 4,848.7 feet of new and 2,480.98 feet of upgraded/improved access road would be constructed. A maximum disturbed ROW width of 100 feet for the access road would result in up to 16.82 acres of new surface disturbance. A buried electric line would be installed in the future, if production is warranted. The utility corridor, including buried electric lines, would be part of the proposed ROW and no additional disturbance is anticipated. A diagram of typical road cross sections is shown in Figure 4. 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 re-seeded 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 near BIA Roads 14 and 30 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.

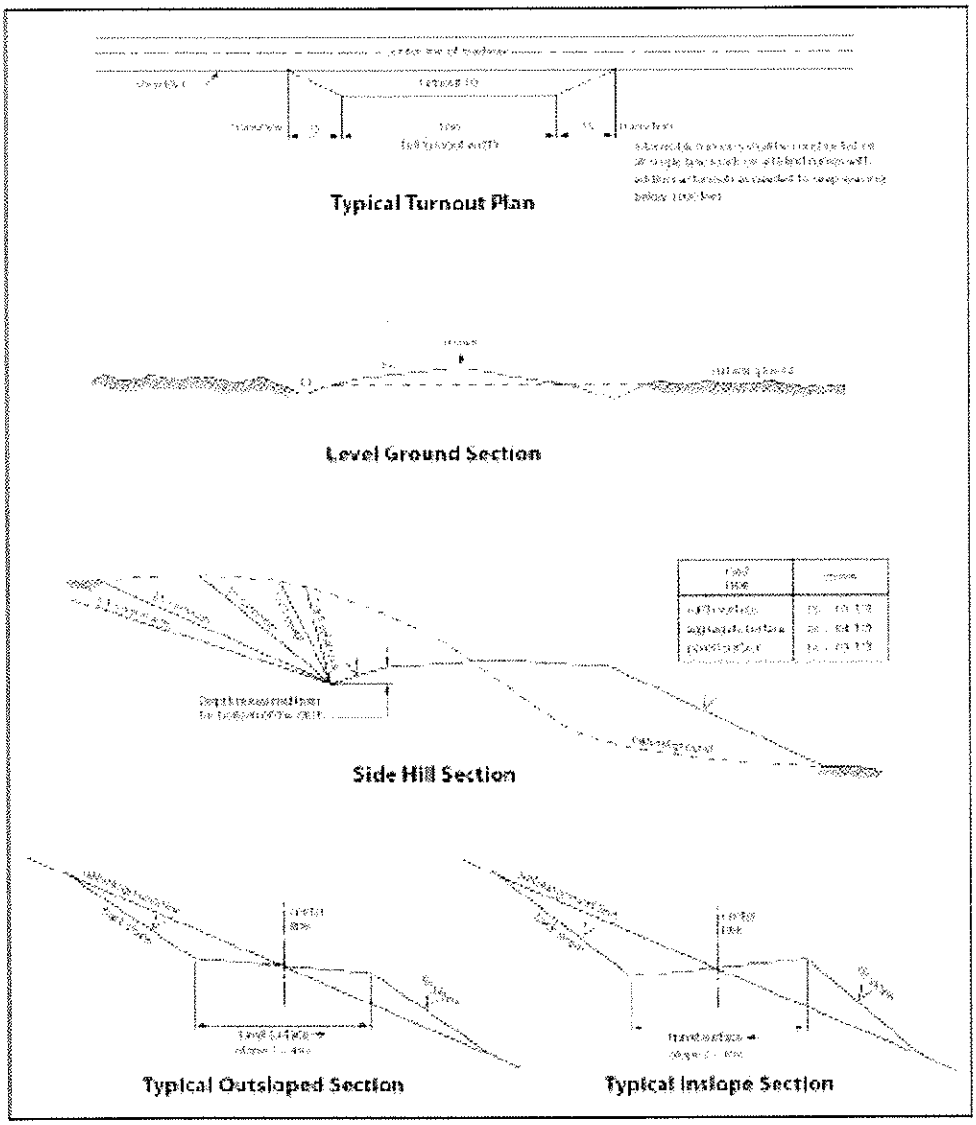


Figure 4. Typical road cross sections (BLM and USFS 2007).

1.6.3 Well Pad

Each proposed location would include a leveled area (pad) used for the drilling equipment. The pad would be stripped of topsoil and vegetation and then graded. The topsoil would be stockpiled and stabilized with a cover crop until it could be used to reclaim the disturbed area. The subsoils would be used in the construction of the pad and the finished pad would be graded to ensure that water drains away from the location. Additional erosion control best management practices (BMPs) would be implemented and could include soil surface protection methodologies and sediment capture features.

Total well pad surface disturbance would be approximately 12.4 acres including cut-and-fill slopes, stockpiled topsoil, and reserve pit backfill. Details of pad construction and reclamation can be found in the APD.

1.6.4 Drilling

After securing mineral leases, Petro-Hunt submitted the Notice of Staking (NOS) to the BLM on the following dates:

- **Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H:** August 11, 2010
- **Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H:** August 11, 2010
- **Fort Berthold #148-95-3A-10-1H:** October 29, 2010

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

Rig transport and on-site assembly would take approximately five days for each well; a typical drill rig is shown in Figure 5. Drilling would require approximately 35 days to reach target depth, using a rotary drilling rig rated for drilling to approximately 30,000 feet. For the first 2,200 feet drilled, a freshwater-based mud system with non-hazardous additives would be used to minimize contaminant concerns. Water would be obtained from a commercial source for this drilling stage, using approximately 50 gallons of water per foot of hole drilled.

After setting and cementing the near-surface casing, an oil-based mud system (80% to 85% diesel fuel and 15% to 20% water) would be used to drill to the 7-inch casing point. Oil-based drilling fluids reduce the potential for hole sloughing while drilling through water-sensitive formations (shales). Approximately 9,000 gallons of water and 25,000 gallons of diesel fuel per well would be used to complete vertical drilling. The lateral reach of the borehole would be drilled using approximately 85,000 gallons of fresh water as mud and adding polymer sweeps as necessary to clean the hole.

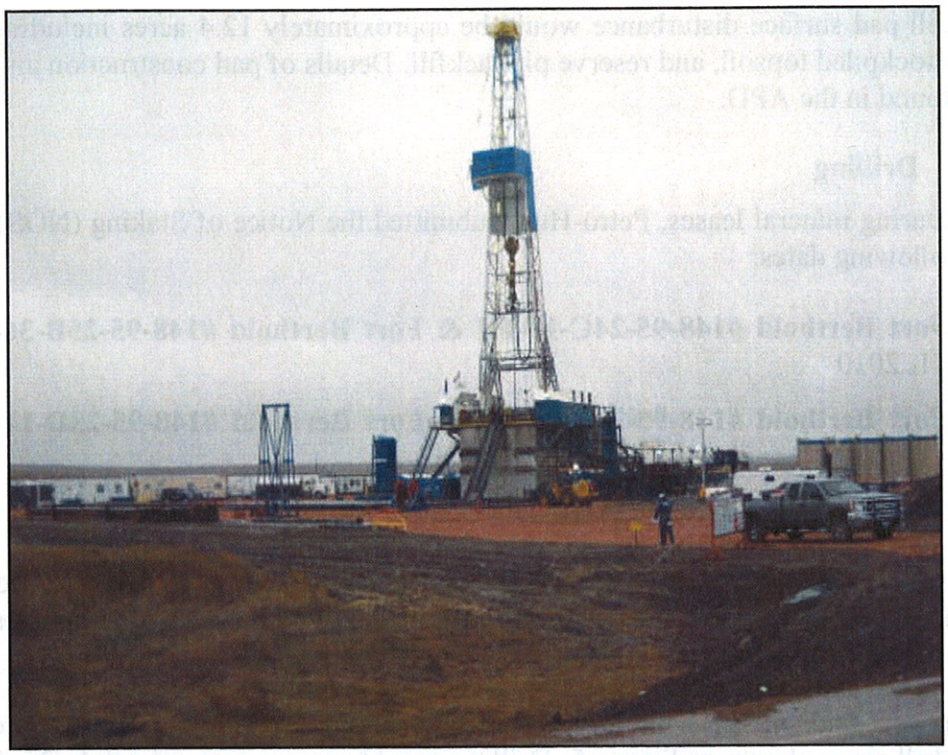


Figure 5. Typical drilling rig (Ruffo 2009).

1.6.5 Casing and Cementing

Surface casing would be set at an approximate depth of 2,500 feet and cemented back to the surface during drilling, in order to ensure the isolation of any potential near-surface freshwater aquifers near or within the project area. The Pierre Formation would be encountered at a depth of approximately 1,500 feet. Production casing would be cemented from approximately 10,800 feet deep to a depth of about 4,000 feet in order to isolate the hydrocarbon zone present in the Dakota Formation below a depth of 5,000 feet. Casing and cementing operations would be conducted in full compliance with Onshore Oil and Gas Order No. 2 (43 CFR 3160).

1.6.6 Completion Activities

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

1.6.7 Commercial Production

If drilling, testing, and production support commercial production from any of the proposed wells, 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 6). An impervious dike sized to hold 100% of the capacity of the largest tank plus one full day's production would surround the tanks and the heater/treater. Load out lines would be located inside the diked area, and a heavy screen-covered drip barrel would be installed under the outlet. A metal access staircase would protect the dike and support flexible hoses used by tanker trucks. For all above-ground facilities not subject to safety requirements, the BIA would choose a paint color recommended by the BLM or the Rocky Mountain Five-State Interagency Committee, which would blend with the natural color of the landscape. Commercial production would be discussed more fully in subsequent NEPA analyses.

Oil from the wells 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 260 barrels of oil per day and 25 barrels of water per day during the first year of production. After the first year, the operator estimates production would decrease to approximately 145 barrels of oil per day and 15 barrels of water per day. Produced water is mostly recovered frac fluids and is expected to become minimal after two years.

Figure 6. 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 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).

1.6.8 Construction Details at Individual Sites

1.6.8.1 Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H

The proposed Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H dual well pad location, seen in Figure 7, is located approximately 7 miles southwest of Mandaree, North Dakota, in the SW¼ SW¼ of Section 24, T148N, R95W, Dunn County, North Dakota. An access road consisting of approximately 4,272.2 feet of new and 1,020.16 feet of upgraded/improved roadway would be constructed from BIA Road 14 to the well location (Figure 8). Construction of the new road would disturb approximately 9.8 acres and the proposed dual well pad would disturb approximately 4.5 acres; in total 14.3 acres of surface area would be disturbed as a result of construction activity. Both spacing units consists of 1,280 acres (+/-) with the bottom holes located in the NE¼ NW¼ of Section 13, T148N, R95W for the Fort Berthold #148-95-24C-13-1H and in the SE¼ SW¼ of Section 36, T148N, R95W for the Fort Berthold #148-95-25B-36-1H (Figure 9).

Vertical drilling of the Fort Berthold #148-95-24C-13-1H would be completed at an approximate depth of 10,714 feet, at which point drilling would turn roughly horizontal to an approximate total vertical depth (TVD) of 11,191 feet. The drill string would total approximately 20,104 feet at the total measured depth (TMD), including approximately 8,640 feet of lateral reach into the Middle Bakken Formation. The drilling terminus is located approximately 250 feet from the north line (FNL) and 1,320 feet from the west line (FWL), approximately 9,017 feet north of the surface hole location. A north/south setback of 200 feet from the section line and an east/west setback of 500 feet from the section line would be maintained.

Vertical drilling of the Fort Berthold #148-95-25B-36-1H would be completed at an approximate depth of 10,714 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 11,191 feet. The drill string would total approximately 22,619 feet at the TMD, including approximately 11,155 feet of lateral reach into the Middle Bakken Formation. The drilling terminus is located approximately 250 feet from the south line (FSL) and 1,320 feet from the east line (FEL), approximately 11,550 feet south of the surface hole location. A north/south setback of 200 feet from the section line and an east/west setback of 500 feet from the section line would be maintained.

Figure 7. Center of Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H dual well pad location, facing south.

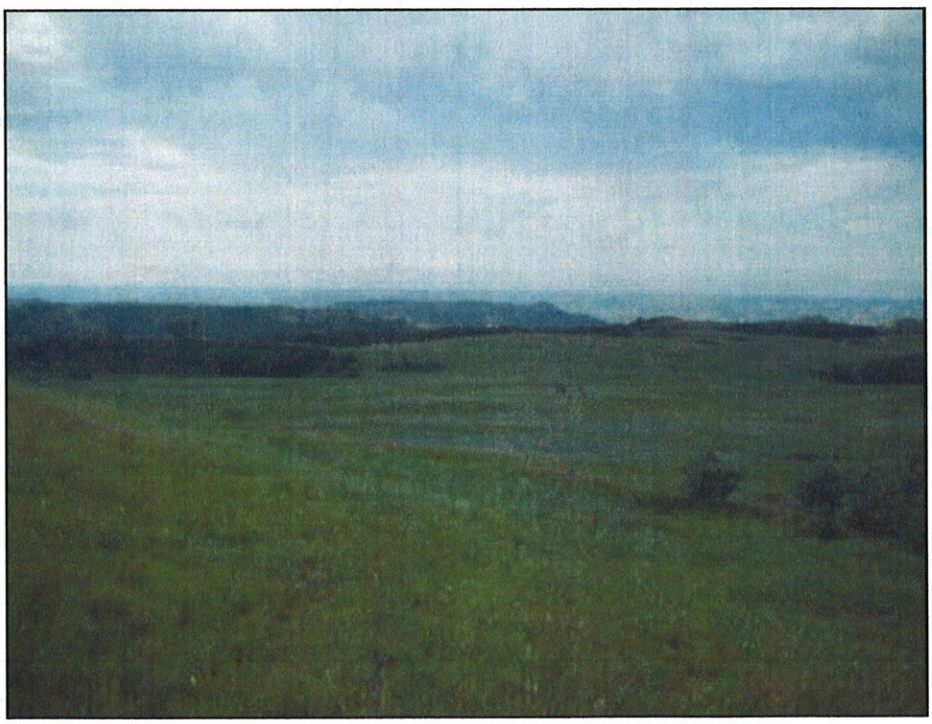


Figure 8. Access road for the Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H dual well pad location, facing south.

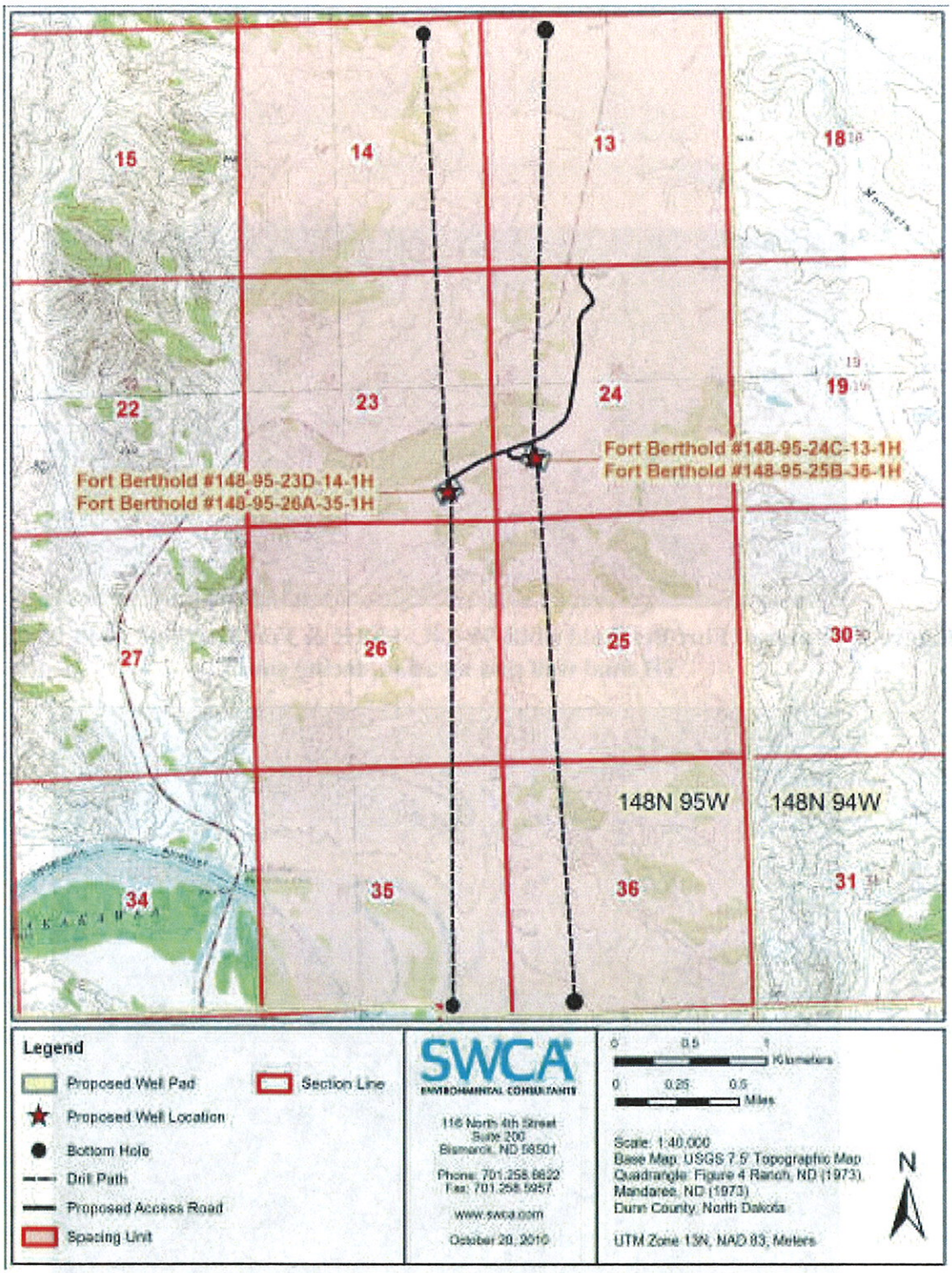


Figure 9. Spacing units for the Fort Berthold #148-95-24C-13-1H, Fort Berthold #148-95-25B-36-1H, Fort Berthold #148-95-26A-35-1H, and Fort Berthold #148-95-23D-14-1H wells.

1.6.8.2 Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H

The proposed Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H dual well pad location, seen in Figure 10, is located approximately 7.3 miles southwest of Mandaree, North Dakota, in the SE¼ SE¼ of Section 23, T148N, R95W, Dunn County, North Dakota. An upgraded/improved access road approximately 1,460.83 feet long would be constructed from the Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H access road to the Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H dual pad location (Figure 11). The proposed dual well pad would disturb approximately 4.5 acres and no new disturbance for the access road would occur; in total 4.5 acres of surface area would be disturbed as a result of construction activity. Both spacing units consist of 1,280 acres (+/-) with the bottom holes located in the SE¼ SE¼ of Section 35, T148N, R95W for the Fort Berthold #148-95-26A-35-1H and in the NW¼ NE ¼ of Section 14, T148N, R95W for the Fort Berthold #148-95-23D-14-1H (Figure 9).

Vertical drilling of the Fort Berthold #148-95-26A-35-1H would be completed at an approximate depth of 10,706 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 11,183 feet. The drill string would total approximately 21,948 feet at the TMD, including approximately 10,492 feet of lateral reach into the Middle Bakken Formation. The drilling terminus is located approximately 250 feet FSL and 1,320 feet FEL, approximately 10,920 feet south of the surface hole location. A north/south setback of 200 feet from the section line and an east/west setback of 500 feet from the section line would be maintained.

Vertical drilling of the Fort Berthold #148-95-23D-14-1H would be completed at an approximate depth of 10,706 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 11,183 feet. The drill string would total approximately 20,700 feet at the TMD, including approximately 9,244 feet of lateral reach into the Middle Bakken Formation. The drilling terminus is located approximately 250 feet FNL and 1,320 feet FEL, approximately 9,698 feet north of the surface hole location. A north/south setback of 200 feet from the section line and an east/west setback of 500 feet from the section line would be maintained.

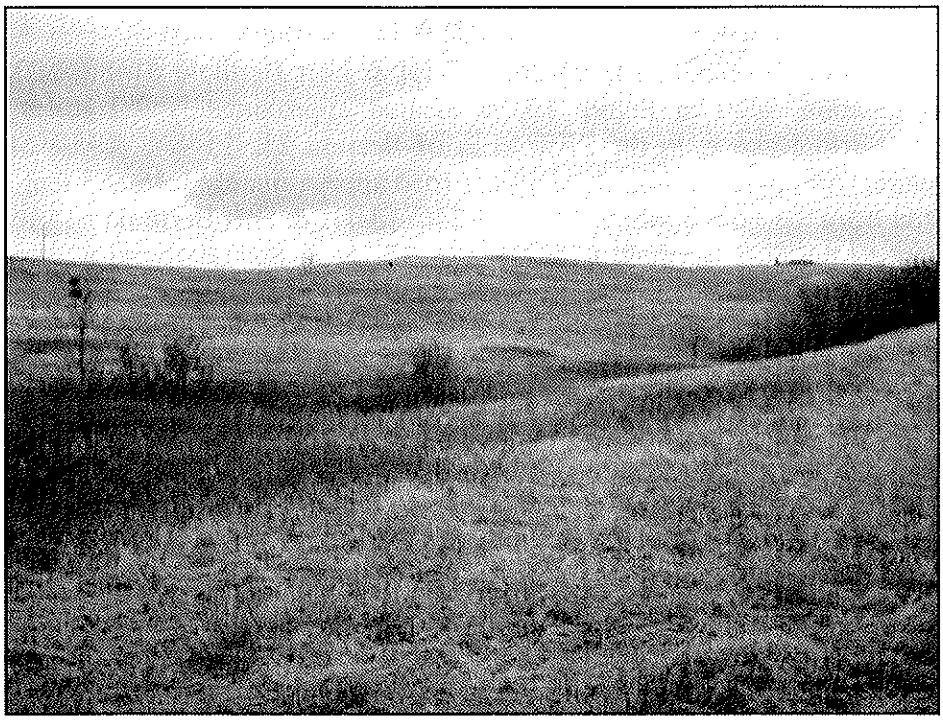


Figure 10. Center of Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H dual well pad location, facing north.

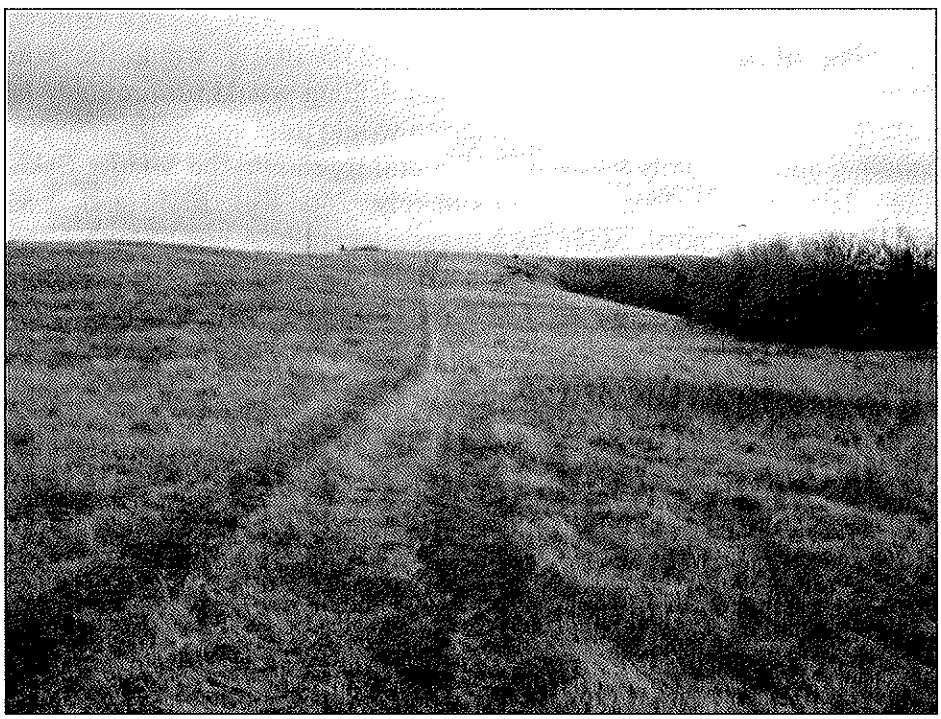


Figure 11. Access road between the Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H well pad and the Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H well pad, facing north-northwest.

1.6.8.3 Fort Berthold #148-95-3A-10-1H

The proposed Fort Berthold #148-95-3A-10-1H well site, seen in Figure 12, is located approximately 4.3 miles southwest of Mandaree, North Dakota, in the NE¼ NW¼ of Section 3, T148N, R95W, Dunn County, North Dakota. A new access road approximately 576.5 feet long would be constructed from the well site to BIA Road 30 (Figure 13). Construction of the new road would disturb approximately 1.3 acres and the proposed well pad would disturb approximately 3.4 acres; in total 4.7 acres of surface area would be disturbed as a result of construction activity. The spacing unit consists of 1,280 acres (+/-) with the bottom hole located in the SW¼ SE¼ of Section 10, T148N, R95W (Figure 14).

Vertical drilling for the Fort Berthold #148-95-3A-10-1H would be completed at an approximate depth of 10,821 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 11,298 feet. The drill string would total approximately 20,990 feet at the TMD, including approximately 9,419 feet of lateral reach into the Middle Bakken Formation. The drilling terminus is located approximately 250 feet FSL and 1,320 feet FEL, approximately 9,820 feet south of the surface hole location. A north/south setback of 200 feet from the section line and an east/west setback of 500 feet from the section line would be maintained.

Figure 12. Center of Fort Berthold #148-95-3A-10-1H well pad location, facing north.

Figure 13. Fort Berthold #148-95-3A-10-1H access road, facing south.

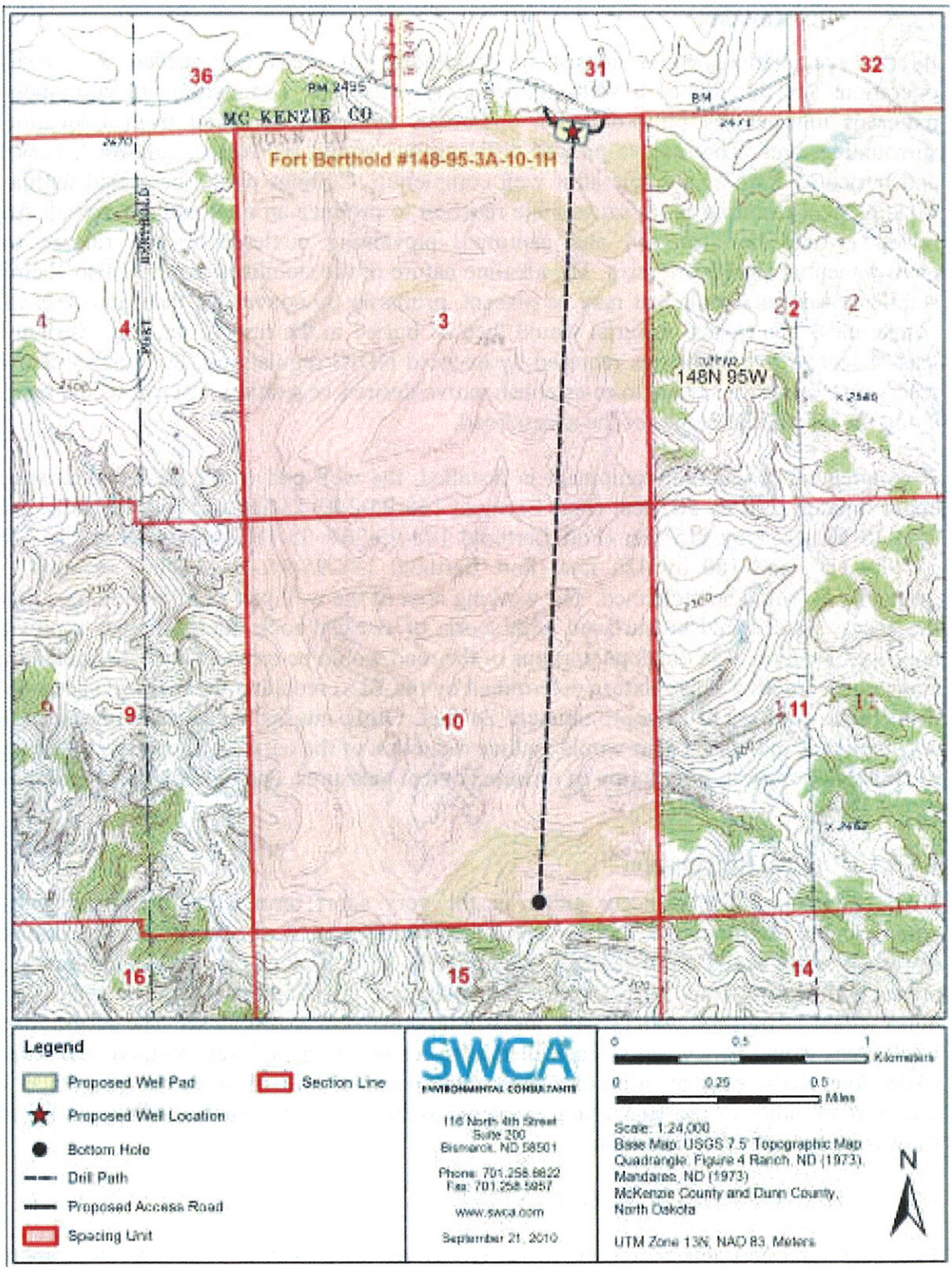


Figure 14. Spacing unit for Fort Berthold #148-95-3A-10-1H well.

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

If commercial production equipment is installed, the well pad would be reduced in size to approximately 250 by 507 feet (Fort Berthold 148-95-24C-13-1H and Fort Berthold 148-95-25B-36-1H), 235 by 515 feet (Fort Berthold 148-95-26A-35-1H and Fort Berthold 148-95-23D-14-1H), and 180 by 420 feet (Fort Berthold 148-95-3A-10-1H) and the rest of the original pad would be reclaimed. The working area of the well pad and the running surface of the access road would be surfaced with scoria or crushed rock obtained from a previously approved location. The outslope portions of the road would be covered with stockpiled topsoil and reseeded with a seed mixture determined by the BIA, reducing the residual access-related disturbance to a width of approximately 28 feet. Other interim reclamation measures to be accomplished in the first year would include reduction of the cut-and-fill slopes, redistribution of stockpiled topsoil, installation of erosion control measures, and reseeding as recommended by the BIA.

1.6.9.1 Final Reclamation

Final reclamation would occur either in the very short term if the proposed wells are 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. The access road 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 15 shows an example of reclamation.

1.7 BIA-PREFERRED ALTERNATIVE

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

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

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

Figure 15. Example of reclamation from the BLM Gold Book (BLM and USFS 2007).

2.0 THE AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

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

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

The Reservation is within the Northwestern Great Plains Ecoregion, which consists of four level 4 ecoregions: 1) the Missouri Coteau Slope north of Lake Sakakawea; 2) the River Breaks; 3) the Little Missouri River Badlands; and 4) the Missouri Plateau south and west of Lake Sakakawea (Bryce et al. 1998). Elevations of the glaciated, gently rolling landscape range from a normal pool elevation of 1,838 feet at Lake Sakakawea to more than 2,600 feet on Phaelan's Butte near Mandaree. Annual precipitation on the plateau averages between 15 and 17 inches. Mean temperatures fluctuate between -3 and 21 degrees Fahrenheit (°F) in January and between 55°F and 83°F in July, with 95 to 130 frost-free days each year (Bryce et al. 1998; High Plains Regional Climate Center 2008).

The proposed wells and spacing units are in a rural area consisting of badlands formations with shrubs and pasture land interspersed between buttes. The landscape has been previously disturbed by dirt trails and gravel and paved roadways. Ten residences are within 1 mile of the proposed well sites, the closest being 2,640 feet northeast of Fort Berthold #148-95-25B-36-1H (Table 1).

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

Proposed Well	Feet to Nearest Home	Direction to Nearest Home
Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H	2,640	northeast
Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H	4,586	northeast
Fort Berthold #148-95-3A-10-1H	4,728	east-northeast

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

2.1 AIR QUALITY

2.1.1 Introduction

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

2.1.2 Greenhouse Gas Emissions and Climate Change

Carbon dioxide (CO_2) is the primary greenhouse gas (GHG), responsible for approximately 90% of radiative forcing (the rate of energy change as measured at the top of the atmosphere; this can be positive [warmer] or negative [cooler]). To simplify discussion of the various GHGs, the term "equivalent CO_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, 1 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 1 ton of CH_4. Nitrogen dioxide has a CO_2e value of 310. Thus, control strategies often focus on the gases with the highest CO_2e value. CH_4 is a common fugitive gas emission in oil and gas fields and is emitted at many phases of exploration and production.

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

receding water levels, North Dakota's hunting, fishing, and tourism industries will be damaged.

2.1.3 Criteria Pollutants

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

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

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

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

Sulfur dioxide (SO_2) is a colorless gas with a strong, suffocating odor. Sulfur dioxide is produced by burning coal, fuel oil, and diesel fuel. Sulfur dioxide can trigger constriction of the airways, causing particular difficulties for asthmatics. Long-term exposure is associated with increased risk of mortality from respiratory or cardiovascular disease. Sulfur dioxide emissions are also a primary cause of acid rain and plant damage.

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

Table 2. Air Quality Standards and Monitored Data.

Pollutant	Averaging Period	National Ambient Air Quality Standard	Year		
			2006	2007	2008
SO_2 (in ppm)	24-hour	*0.14*	0.011	0.011	0.009
	Annual Mean	*0.03*	0.002	0.002	0.002
PM_{10} (in $\mu g/m^3$)	24-hour	150	50	57	108
	Annual Mean	50	14	13	16
$PM_{2.5}$ (in $\mu g/m^3$)	24-hour	35	18.9	13.5	16.4
	Weighted Annual Mean	15	6.3	6.6	6.7
NO_2 (in ppm)	Annual Mean	*0.053*	0.003	0.003	0.003
O_3 (in ppm)	1-hour	*0.12*	0.076	0.076	0.069
	8-hour	*0.08*	0.067	0.065	0.063

Source: EPA 2009. $\mu g/m^3$ = micrograms per cubic meter; ppm = parts per million
Note: For $PM_{2.5}$ the fourth-highest 24-hour value is reported per EPA attainment evaluation protocol.

2.1.4 Hazardous Air Pollutants

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

Risk assessments express premature mortality in terms of the number of deaths expected per million persons. The North Dakota Department of Health (NDDH) typically reviews projects and either requires an applicant to prepare a risk assessment or assign the state engineers to do the work. The state requires that maximum individual cancer risk be calculated using its adopted protocol (the Determination of Compliance in the state's Air Toxics Policy). For new sources emitting HAPs with known negative health effects, an applicant must demonstrate that the combined impact of new HAP emission does not result in a maximum individual cancer risk greater than 1×10^{-5} (1 in 100,000).

2.1.5 Air Monitoring

Although the state of North Dakota does not have jurisdiction over air quality matters on the Reservation, it is helpful to note the monitoring efforts 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 is subject to quality assurance, and when approved, it is published on the Internet (available from the EPA and other sources). Monitoring stations near the project site include Watford City in McKenzie County, Dunn Center in Dunn County, and Beulah in Mercer County. These stations are located west, south, and southeast of the proposed well sites, respectively. Criteria pollutants measured include SO_2, PM_{10}, NO_2, and ozone. Lead and carbon monoxide are not monitored by any of the three stations. Table 1 summarizes federal air quality standards and available air quality data from the three-county study area. The highest value at any of the three monitoring locations is shown for each year.

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

- SO_2 (parts per million [ppm]) – 0.023 annual arithmetic mean, 0.099 24-hour concentration, and 0.273 one-hour concentration
- Hydrogen sulfide (H_2S) (ppm) – 10 instantaneous, 0.20 one-hour, 0.10 24-hour, and 0.02 three-month arithmetic mean

All other state criteria pollutant standards are the same as the federal standards (shown in Table 1). North Dakota was one of 13 states that met standards for all federal criteria pollutants in 2008.

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

2.1.6 Response to the Threat of Climate Change

The EPA has proposed an endangerment finding that would allow regulation of GHGs under the CAA. The first step is a regulation that requires sources emitting 25,000 tons or more CO_2e to report their emissions. The EPA and the National Highway Traffic Safety Administration have increased corporate fuel economy standards to promote national energy security and reduce GHGs. Standards will equal 35 miles per gallon by 2020, with an estimated savings to drivers of $100 billion annually. Many U.S. states and foreign nations have adopted goals and actions to reduce GHGs to levels scientists forecast will allow the earth's climate to stabilize at 1 to 2 degrees Celsius above the current level. Additional regulation is currently being developed by Congress to roll back emissions to levels recommended by atmospheric scientists.

2.1.7 Typical Project Emissions

Oil field 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 wind-blown dust (from truck and construction activity).
- Vented emissions include GHGs, VOCs, and HAPs. Primary sources are emergency pressure relief valves and dehydrator vents.

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

2.1.8 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 six general categories:

- Transportation BMPs to reduce the amount of fugitive dust and vehicle emissions
  - Use directional drilling to drill multiple wells form 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.

2.2 WATER RESOURCES

2.2.1 Surface Water

No perennial waterbodies are located near the proposed project area. Given the topography of the individual sites over the project area, runoff occurs largely as sheet-flow. Runoff that concentrates near the proposed project area will flow via sheet-flow into a constructed diversion ditch, which will transport run-off around the north side of the well pad and into an ephemeral channel which drains south, parallel to State Highway 22. Run-off will be transported through the ephemeral drainage until its confluence with an unnamed intermittent stream to the southwest of the project area. Run-off will then travel south-southeast through the intermittent channel until its confluence with the Lower Little Missouri River (Figures 16 and 17). Run-off will be transported via the Lower Little Missouri River until it enters into Lake Sakakawea.

The proposed Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H dual well pad is located in the Dry Creek (hydrologic unit code [HUC] 101102060601), Burnt Creek (HUC 1011020506), and the Lower Little Missouri River (HUC 10110205). Runoff from the well pad would travel approximately 2 miles south through an unnamed ephemeral tributary of the perennial Little Missouri River (HUC 101102) (Figure 18).

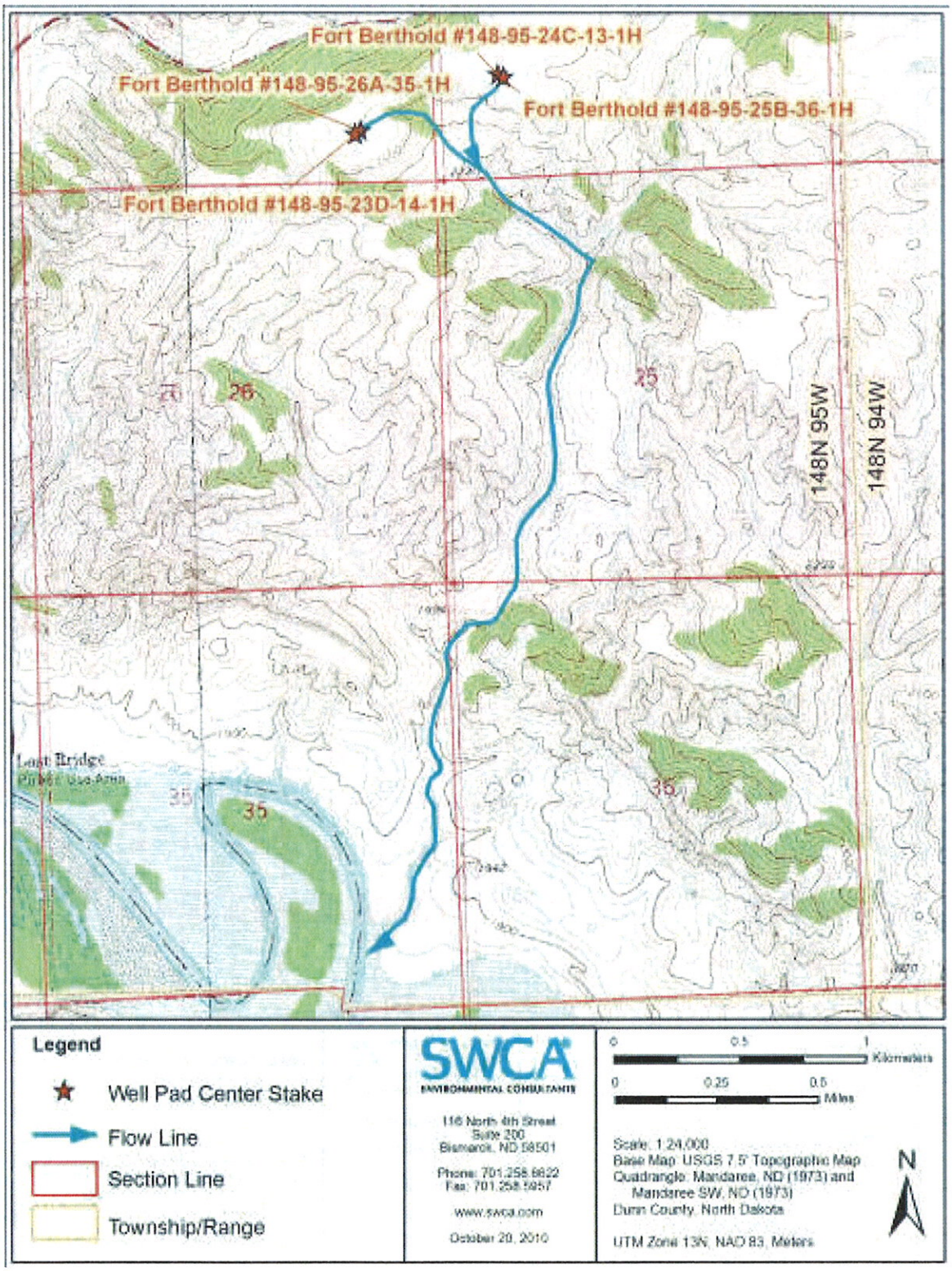


Figure 16. Predicted water flow from the two dual pads project area to the nearest perennial waterbody.

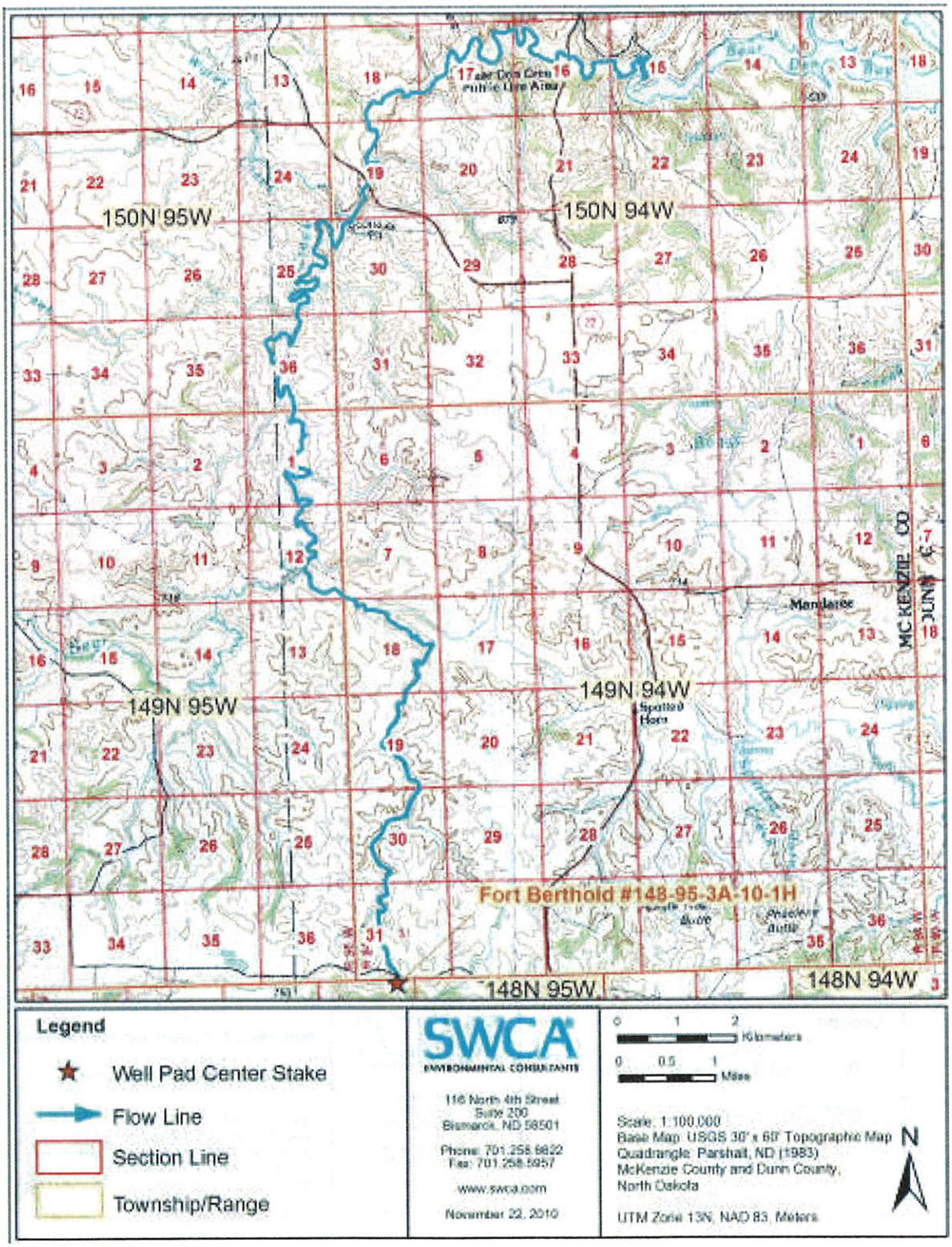


Figure 17. Predicted water flow from the Fort Berthold #148-95-3A-10-1H location to the nearest perennial waterbody.

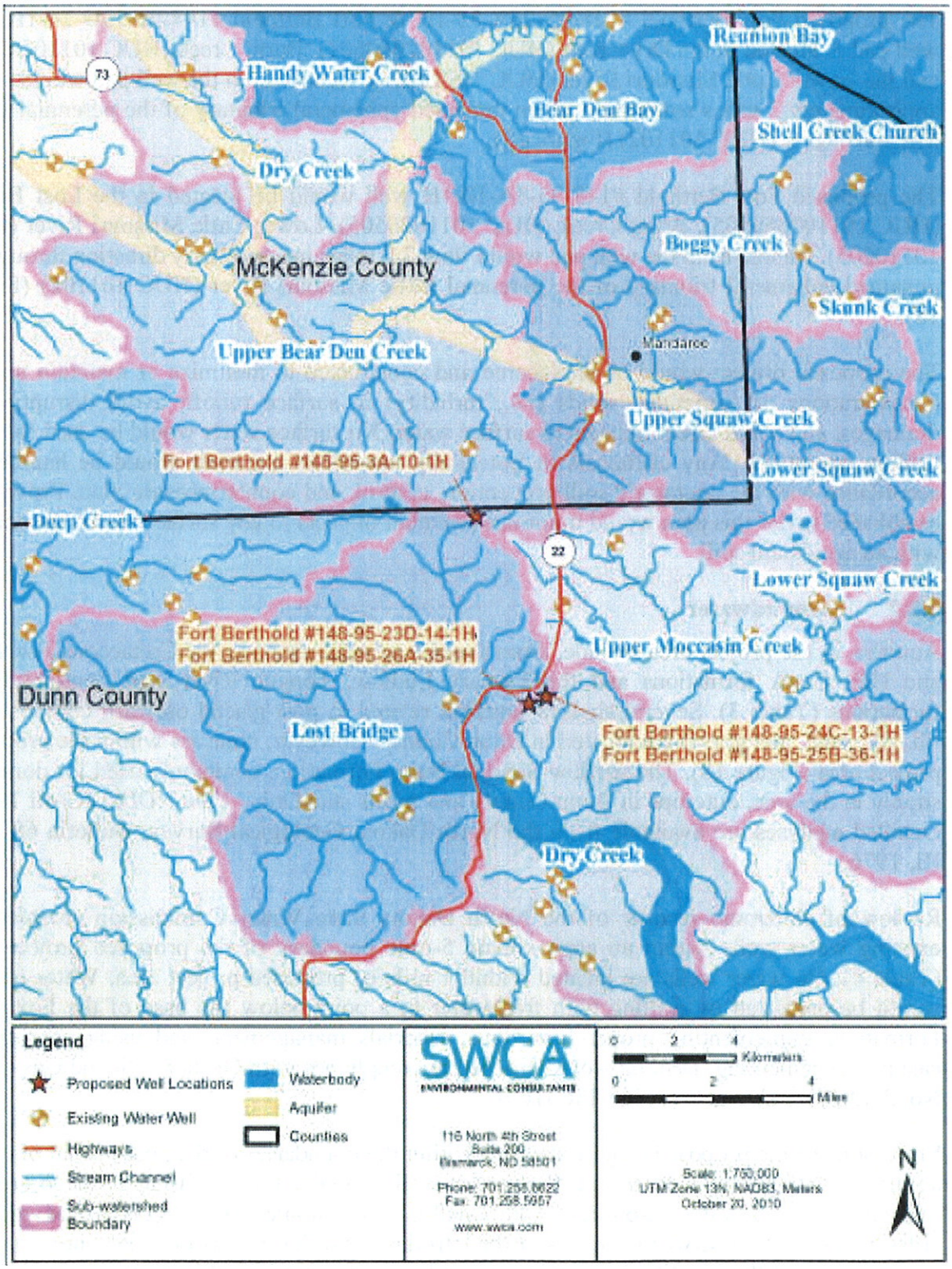


Figure 18. Watersheds, aquifers, and existing water wells near the project area.

The proposed Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H dual well pad is located in the Dry Creek (HUC 101102060601), Burnt Creek (HUC 1011020506), and the Lower Little Missouri River (HUC 10110205). Runoff from the well pad would travel approximately 2 miles south through an unnamed ephemeral tributary of the perennial Little Missouri River (HUC 101102) (Figure 18).

The proposed Fort Berthold #148-95-3A-10-1H well would be located in the Lost Bridge (HUC 101102050505), Brunt Creek (HUC 1011020505), Lower Little Missouri River (HUC 10110205). Runoff from the well pad would flow 3.2 miles in a southerly direction through an unnamed ephemeral tributary of the perennial Little Missouri River (HUC 101102) (Figure 18).

The proposed project would be engineered and constructed to minimize or maintain normal concentrations of suspended solids (i.e., turbidity) in 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.

2.2.2 Groundwater

Aquifers in the project area include, from deepest to most shallow, the Cretaceous Fox Hills and Hell Creek formations and the Tertiary Ludlow, Tongue River, and Sentinel Butte formations (Table 3). Several shallow aquifers related to post-glacial outwash composed of till, silt, sand, and gravel are located in Dunn County. However, none are within the proposed project area (Figure 18). 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 23 existing water wells within an approximate 5-mile boundary of the proposed project area (Table 4). No water wells are located within 1 mile of proposed project area. Water quality would be protected by drilling with freshwater to a point below the base of the Fox Hills Formation, implementing proper hazardous materials management, and using appropriate casing and cementing. Drilling would proceed in compliance with Onshore Oil and Gas Order No. 2, *Drilling Operations* (43 CFR 3160).

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

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

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

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

Table 4. Existing Water Wells near the Project Area.

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
14709504BBA	Martin Kleeman	Unknown	4	147N/095W	Unknown	1348	Hell Creek	FB148-95-23D-14-1H	3.36
14709512BCD	Thorris Sandvick	Unknown	12	147N/095W	Unknown	400	Tongue River	FB148-95-23D-14-1H	3.53
14709512CAD	Thorris Sandvick	Unknown	12	147N/095W	Unknown	1420	Fox Hills	FB148-95-23D-14-1H	3.81
14709514AAA	NDSPS	Unknown	14	147N/095W	Municipal	1430	Fox Hills	FB148-95-23D-14-1H	4.13
14709514CBB1	George Kleeman	Unknown	14	147N/095W	Unknown	52	Sentinel Butte-Tongue River	FB148-95-23D-14-1H	4.68
14709515BB	Thomas Sandvick	1976	15	147N/095W	Stock	70	Unknown	FB148-95-23D-14-1H	4.47
14809405BCB	USGS	1994	05	148N/094W	Monitoring	106	Unknown	FB 148-95-25B-36-1H	3.88
14809406CBB	Gabe Fettig	2002	06	148N/094W	Stock	700	Unknown	FB 148-95-24C-13-1H	3.28
14809406DBD	United Tribes	Unknown	16	148N/094W	Unknown	Unknown	Sentinel Butte-Tongue River	FB 148-95-24C-13-1H	3.39
14809415CC2	USGS	1994	15	148N/094W	Monitoring	40	Unknown	FB 148-95-25B-36-1H	3.95
14809417DCD2	USGS	1994	17	148N/094W	Monitoring	72	Unknown	FB 148-95-25B-36-1H	2.61

Well Number	Owner	Date Drilled	Section	Township/ Range	Type/Use	Depth (feet)	Aquifer	Nearest Well	Miles to Proposed Well
14809420ABB	Curtis Hall	2009	20	148N/094W	Domestic	220	Unknown	FB 148-95-25B-36-1H	2.47
14809421AAB1	Unknown	1994	21	148N/094W	Monitoring	190	Unknown	FB 148-95-25B-36-1H	3.66
14809428	Matt Young Bird, Sr.	1982	28	148N/094W	Domestic	260	Unknown	FB 148-95-25B-36-1H	3.37
14809503	Daryl Youngbird	1985	03	148N/095W	Domestic	257	Unknown	FB 148-95-26A-35-1H	3.58
14809512DB	Joe Woundedface	1993	12	148N/095W	Domestic	58	Unknown	FB 148-95-24C-13-1H	2.18
14809512DCC2	USGS	1992	12	148N/095W	Monitoring	52	Tongue River	FB 148-95-24C-13-1H	1.85
14809520	Jim Mittlestadt	1975	20	148N/095W	Domestic	75	Unknown	FB 148-95-23D-14-1H	3.32
14809522CCA	Emerson Chase	Unknown	22	148N/095W	Unknown	1455	Surface Water	FB 148-95-23D-14-1H	1.60
14809531CCA	George Tabor	Unknown	31	148N/095W	Unknown	1350	Surface Water	FB 148-95-23D-14-1H	4.96
14809532DBD	George Tabor	Unknown	32	148N/095W	Unknown	1365	Fox Hills	FB 148-95-23D-14-1H	3.57
14809533BDB	D. Meyer	1931	33	148N/095W	Unknown	436	Fox Hills	FB 148-95-23D-14-1H	2.86
14809535BDD	Tony Fettig	1972	35	148N/095W	Unknown	400	Fox Hills	FB 148-95-23D-14-1H	1.57

Source: North Dakota State Water Commission 2009

2.3 WETLANDS, HABITAT, AND WILDLIFE

2.3.1 Wetlands

National Wetland Inventory maps maintained by the U.S. Fish and Wildlife Service (USFWS) do not identify any jurisdictional wetlands in the area of the proposed well pads or access roads (USFWS 2009). No wetlands were observed within the project area during the field survey conducted in May and June 2010. No riparian or wetland habitats are anticipated to be directly or indirectly impacted by the construction of the proposed access road or wells; however, due to the proximity of the Little Missouri River, BMPs will be recommended to assist in sediment velocity flow control.

According to the USFWS National Wetland Inventory database, palustrine emergent (PEM) wetlands are located between 0.4 and 1.1 miles from the proposed project areas (Table 5). These PEM wetlands would not be impacted as a result of construction, drilling, or production activities associated with the proposed well pads and associated access roads.

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

Proposed Well	Distance (mile)	Bearings (degrees)
Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H	0.75	95
Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H	1.1	87
Fort Berthold #148-95-3A-10-1H	0.4	226

2.3.2 Wildlife

Several wildlife species that may exist in Dunn County are listed as threatened or endangered under the Endangered Species Act of 1973, as amended (ESA). Listed species in Dunn County include the black-footed ferret, gray wolf, interior least tern, pallid sturgeon, piping plover, and whooping crane (USFWS 2010a). Although delisted in 2007, the bald eagle remains a species of special concern to the BIA and the Department of the Interior, and is effectively treated the same as a listed species. Tribes and states may recognize additional species of concern; however, such lists are taken under advisement by federal agencies but are not legally binding in the manner of the ESA. Listed species are described below.

ENDANGERED SPECIES ACT

Black-footed Ferret (*Mustela nigripes*)
Affects Determination: No Effect

Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily due to range-wide decimation of the prairie dog (*Cynomys* sp.) ecosystem (Kotliar et al. 1999). They have been listed by the USFWS as endangered since 1967, and have been the object of extensive re-introduction programs

(USFWS 2010b). Ferrets inhabit extensive prairie dog complexes of the Great Plains, typically composed of several smaller colonies in proximity to one another that provide a sustainable prey base. The *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (USFWS 1989) states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres in size, and towns of this dimension may be important for ferret recovery efforts (USFWS 1988a). Prairie dog towns of this size are not found in the Project Area. In addition, this species has not been observed in the wild for more than 20 years. The proposed project will have **no effect** on this species.

Gray Wolf (*Canis lupus*)
Affects Determination: May Affect, but is Not Likely to Adversely Affect

The gray wolf, listed as endangered in the United States in 1978, was believed extirpated from North Dakota in the 1920s and 1930s with only sporadic reports from the 1930s to present (Licht and Huffman 1996). The presence of wolves in most of North Dakota consists of occasional dispersing animals from Minnesota and Manitoba (Licht and Fritts 1994; Licht and Huffman 1996). Most documented gray wolf sightings that have occurred within North Dakota are believed to be young males seeking to establish territory (Hagen et al. 2005). The Turtle Mountains region in north-central North Dakota provides marginal habitat that may be able to support a very small population of wolves. The closest known pack of wolves is the Minnesota population located approximately 28 kilometers (km) from the northeast corner of North Dakota.

The gray wolf uses a variety of habitats that support a large prey base, including montane and low-elevation forests, grasslands, and desert scrub (USFWS 2010c). 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. Additionally, habitat fragmentation, in particular road construction as a result of oil and gas development, may further act as a barrier against wolf recolonization in western North Dakota. Therefore, the proposed project may affect but is not likely to adversely affect the gray wolf.

Whooping Crane (*Grus americana*)
Affects Determination: May Affect, but is Not Likely to Adversely Affect

The whooping crane was listed as endangered in 1970 in the United States by the USFWS, and in 1978 in Canada. Historically, population declines were caused by shooting and destruction of nesting habitat in the prairies from agricultural development. Current threats to the species includes habitat destruction, especially suitable wetland habitats that support breeding and nesting, as well as feeding and roosting during their fall and spring migration (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007).

The July 2010 total wild population was estimated at 383 (USFWS 2010d). There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, where approximately 83%

of the wild nesting sites occur (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007; USFWS 2010d). Dunn and McKenzie counties, including the project area, are within the primary migratory flyway of whooping cranes.

Whooping cranes probe the soil subsurface with their bills for foods on the soil or vegetation substrate (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Whooping cranes are omnivores and foods typically include agricultural grains, as well as insects, frogs, rodents, small birds, minnows, berries, and plant tubers. The largest amount of time during migration is spent feeding in harvested grain fields (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Studies indicate that whooping cranes use a variety of habitats during migration, in addition to cultivated croplands, and generally roost in small palustrine (marshy) wetlands within 1 km of suitable feeding areas (Howe 1987, 1989). Whooping cranes have been recorded in riverine habitats during their migration, with eight sightings along the Missouri River in North Dakota (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007:18). In these cases, they roost on submerged sandbars in wide, unobstructed channels that are isolated from human disturbance (Armbruster 1990).

It is plausible that whooping cranes would stop in the project area during their migration since suitable wetlands and open riverine habitats do occur relatively near the proposed well pads and access roads. Project precautionary measures would be implemented if a whooping crane is sighted in the project area. Petro-Hunt would cease all drilling or construction activities and notify the USFWS of the sighting, should a crane be spotted within 1 mile of the project area. As a result, the proposed project may affect, but is not likely to adversely affect the endangered whooping crane.

Piping plover (*Charadrius melodus*)
Affects Determination:

- Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H: **May Affect, but is Not Likely to Adversely Affect**
- Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H: **May Affect, but is Not Likely to Adversely Affect**
- Fort Berthold #148-95-3A-10-1H: **No Effect**

The piping plover is a small shorebird which breeds only in three geographic regions of North America: the Atlantic Coast, the Northern Great Plains, and the Great Lakes. Piping plover populations were federally listed as threatened and endangered in 1985, with the Northern Great Plains and Atlantic Coast populations listed as threatened, and the Great Lakes population listed as endangered (USFWS 1985a).

Plovers in the Great Plains make their nests on open, sparsely vegetated sand or gravel beaches adjacent to alkali wetlands, and on beaches, sand bars, and dredged material islands of major river systems (USFWS 2002, 2010e). The shorelines of lakes of the Missouri River constitute significant nesting areas for the bird. Piping plovers nest on the ground, making shallow scrapes in the sand, which they line with small pebbles or rocks (USFWS 1988b). Anthropogenic alterations of the landscape along rivers and lakes where piping plover nest

have increased the number and type of predators, subsequently decreasing nest success and chick survival (USFWS 2002, 2010e). The birds fly south by mid to late August to areas along the Texas coast and Mexico (USFWS 2002). The Northern Great Plains population has continued to decline despite federal listing, with population estimates of 1,500 breeding pairs in 1985 reduced to fewer than 1,100 in 1990. Low survival of adult birds has been identified as a factor (Root et al. 1992). Current conservation strategies include identification and preservation of known nesting sites, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 1988b, 2010e).

Suitable shoreline habitat for breeding and nesting plovers does not occur in the project area, and Lake Sakakawea is a minimum of 1.6 miles south and the Little Missouri River is 4.6 miles southwest from the proposed dual well pads and access roads. It is unlikely that migrating plovers would visit the project area during their migration. Therefore construction of the Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H and Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H may affect but is not likely to adversely affect piping plover. Additionally, due to the distance between the Fort Berthold #148-95-3A-10-1H and Lake Sakakawea no effect is anticipated as a result of construction or operation activities.

Designated Critical Habitat of Piping Plover
Affects Determination:

- Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H: **May Affect, but is Not Likely to Adversely Affect**
- Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H: **May Affect, but is Not Likely to Adversely Affect**
- Fort Berthold #148-95-3A-10-1H: **No Effect**

The USFWS has designated critical habitat for the Great Lakes and Northern Great Plains populations of piping plover (USFWS 2002). Designated Critical habitat for the piping plover includes 183,422 acres and 1,207.5 river miles of habitat, including areas near the proposed Project, along the shoreline of Lake Sakakawea in McKenzie County, North Dakota (USFWS 2002).

Since the project will not modify, alter, disturb, or affect the shoreline of Lake Sakakawea or any of its tributary streams in any way, no effect to designated critical habitat of the piping plover would occur as a result of the construction of the Fort Berthold #148-95-3A-10-1H well pad and access road. Construction of the Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H and Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H dual well pads may affect but is not likely to adversely affect designated critical habitat of the piping plover.

Interior Least Tern (*Sterna antillarum*)
Affects Determination:

- Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H: **May Affect, but is Not Likely to Adversely Affect**
- Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H: **May Affect, but is Not Likely to Adversely Affect**
- Fort Berthold #148-95-3A-10-1H: **No Effect**

The interior population of the least tern is listed as endangered by the USFWS (1985b). This bird is the smallest member of the gull and tern family, measuring approximately 9 inches in length. Terns remain near flowing water, where they feed by hovering over and diving into standing or flowing water to catch small fish (USFWS 2010f).

The interior population of least terns breeds in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems, where they nest in small colonies. From late April to August, terns nest in a shallow hole scraped in an open sandy area, gravel patch, or exposed flat and bare sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. The adults continue to care for chicks after they hatch. Least terns in North Dakota will often be found sharing sandbars with the piping plover, a threatened species (USFWS 2010f).

Census data indicate over 8,000 least terns in the interior population. In North Dakota, the least tern is found mainly on the Missouri River from Garrison Dam south to Lake Oahe, and on the Missouri and Yellowstone rivers upstream of Lake Sakakawea (USFWS 1990a, 2010f). Approximately 100 pairs breed in North Dakota (USFWS 2010f). Details of their migration are not known, but their winter range is reported to include the Gulf of Mexico and Caribbean Islands (USFWS 1990a, 2010f).

Loss of suitable breeding and nesting habitat for terns has resulted from dam construction and river channelization on major rivers throughout the Mississippi, Missouri, and Rio Grande River systems. River and reservoir changes have led to reduced sandbar formation and other shoreline habitats for breeding, resulting in population declines. In addition, other human shoreline disturbances affect the species (USFWS 1990a). Critical habitat has not been designated for the species (USFWS 2010f).

Current conservation strategies include identification and avoidance of known nesting areas, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 2010e).

Suitable shoreline habitat for breeding and nesting least terns does not occur in the project area, and Lake Sakakawea is a minimum of 1.6 miles south and the Little Missouri River is 4.6 miles southwest from the proposed well pads and access roads. It is unlikely that migrating least terns would visit the project area during their migration. Therefore construction of the Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H and Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H may affect but is not likely to adversely affect interior least terns. Additionally, due to the distance between the Fort Berthold #148-

95-3A-10-1H and Lake Sakakawea no effect is anticipated as a result of construction or operation activities.

Pallid Sturgeon (*Scaphirhynchus albus*)
Affects Determination:

- Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H: **May Affect, but is Not Likely to Adversely Affect**
- Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H: **May Affect, but is Not Likely to Adversely Affect**
- Fort Berthold #148-95-3A-10-1H: **No Effect**

The pallid sturgeon was listed as Endangered in 1990 in the United States by the USFWS (1990b). The primary factor leading to the decline of this species is the alteration of habitat through river channelization, creation of impoundments, and alteration of flow regimes (USFWS 1990b). These alterations within the Missouri River have blocked movements to spawning, feeding, and rearing areas, destroyed spawning habitat, altered flow conditions which can delay spawning cues, and reduced food sources by lowering productivity (USFWS 2007a). The fundamental elements of pallid sturgeon habitat are defined as the bottom of swift waters of large, turbid, free-flowing rivers with braided channels, dynamic flow patterns, flooding of terrestrial habitats, and extensive microhabitat diversity (USFWS 1990b).

The pallid sturgeon population which is found near the Project Area occurs from the Missouri River below Fort Peck Dam to the headwaters of Lake Sakakawea and the lower Yellowstone River up the confluence of the Tongue River, Montana (USFWS 2007a). This population consists of approximately 136 wild adult pallid sturgeons (USFWS 2007a). Hatchery reared sturgeon have also been stocked since 1998. The pallid sturgeon has been found to utilize the 25 km of riverine habitat that would be inundated by Lake Sakakawea at full pool (Bramblett 1996 per USFWS 2007a). Larval pallid sturgeons have also been found to drift into Lake Sakakawea. While the majority of pallid sturgeons are found in the headwaters of Lake Sakakawea, North Dakota Game and Fish have caught and released pallid sturgeon in nets set in 80 to 90 feet of water between the New Town and Van Hook area. Based on this information, pallid sturgeon could be found throughout Lake Sakakawea (personal communication, email from Steve Krentz, Pallid Sturgeon Project Lead, U.S. Fish and Wildlife Service, to Mike Cook, Aquatic Ecologist, SWCA Environmental Consultants, September 3, 2010).

Suitable habitat for pallid sturgeon does not occur in the project area, and Lake Sakakawea is a minimum of 1.6 miles away from the proposed well pads and access roads. Potential pollution and sedimentation occurring within the project area are concerns for downstream populations of endangered 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. Therefore, the construction and operation of the proposed Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H and Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H dual well pads may effect, but

are not likely to adversely affect pallid sturgeon. Additionally, the construction and operation of the Fort Berthold #148-95-3A-10-1H well pad and access road will have no effect on pallid sturgeon based on the location of the well pad within the Upper Bear Den Creek watershed, approximately 24 stream miles from Bear Den Bay of Lake Sakakawea.

Dakota Skipper (*Hesperia dacotae*)
Affects Determination: May Affect, but is Not Likely to Adversely Affect

The Dakota skipper is a small butterfly with a 1-inch wingspan and is found primarily in undisturbed native tall grass and upland dry mixed grass prairie areas with a high diversity of wildflowers and grasses (Committee on the Status of Endangered Wildlife in Canada 2003). The Dakota skipper appears to require a range of precipitation-evaporation ratios between 60 and 105 and a soil pH between 7.2 and 7.9 (McCabe 1981). Larvae feed on grasses, favoring little bluestem. Adults commonly feed on nectar of flowering native forbs such as harebell (*Campanula rotundifolia*), wood lily (*Lilium philadelphicum*), and purple coneflower. The species is threatened by conversion of native prairie to cultivated agriculture or shrublands, over-grazing, invasive species, gravel mining, and inbreeding (USFWS 2005). Although suitable habitat occurs in the area, Dakota skippers are not known to occur within the project area. The proposed project **may affect, but is not likely to adversely affect** this species. The use of BMPs and conservation guidelines (USFWS 2007b) during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

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

Bald Eagle (*Haliaeetus leucocephalus*)
Status: Delisted in 2007; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act
Effects of Project: May Affect, but is Not Likely to Adversely Affect

Suitable nesting or foraging habitat for bald eagles includes old growth trees relatively close (usually less than 1.24 miles [Hagen et al. 2005]) to perennial waterbodies. The project area does not contain old growth trees and the closest well pad (Fort Berthold #148-95-23D-14-1H & Fort Berthold #148-95-26A-35-1H) is 1.6 miles from Lake Sakakawea and 4.6 miles from the Little Missouri River. No eagles were observed during the field surveys. Therefore, no adverse effects are anticipated. However, the possibility of transient, flying bald eagle individuals traversing the project area does exist.

Golden Eagle (*Aquila chrysaetos*)
Status: Unlisted; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act
Effects of Project: May Affect, but is Not Likely to Adversely Affect

No eagles were observed during the field surveys; however, golden eagles may occur within or near the project area. 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 suitable nesting habitat. However, no primary or secondary indication of golden eagle presence, including nests, was observed within or near the project area during the field survey. Therefore, the project is unlikely to cause any adverse effects to golden eagles.

The wildlife species listed in Table 6 were observed during field visits to the proposed project area. All wildlife species listed were noted using the observation of primary (visual) or secondary indicators (i.e., scat, tracks, or both).

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

Well Pad	Common Name	Scientific Name	Observation Type	Habitat
Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H	Deer	*Odocoileus* sp.	Secondary	Mixed-grass Prairie
	Red-tailed Hawk	*Buteo jamaicensis*	Primary	Mixed-grass Prairie
Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H	Deer	*Odocoileus* sp.	Secondary	Mixed-grass Prairie
	Coyote	*Canis latrans*	Primary	Mixed-grass Prairie
Fort Berthold #148-95-3A-10-1H	Deer	*Odocoileus* sp.	Primary	Mixed-grass Prairie

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

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

- locating the 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 long-term adverse impact.

2.4 SOILS

The proposed 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.

2.4.1 Natural Resources Conservation Service Soil Data

The Natural Resources Conservation Service (NRCS 2009) soil series present on the well pad and access road areas, and the respective acreages, are summarized in Table 7. The acreage shown in Table 7 is based on the spatial extent of soil series combinations derived from NRCS data (Figures 19 and 20); therefore, the acreage is approximate and used as a best estimate of soil series distribution within the proposed project area.

The following soil series descriptions represent individual soil series reported to exist within the proposed project area (NRCS 2009). Each individual soil series does not exist individually in the project area but rather in combination with other soil types (Table 7).

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 needleandthread (*Hesperostipa comata*), western wheatgrass (*Pascopyrum smithii*), and blue grama (*Bouteloua gracilis*) (NRCS 2009).

Arikara: The Arikara series consists of very deep, well-drained soils found on wooded slopes. Permeability is moderate with slopes ranging from approximately 9 to 70 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 40°F. This soil type is used most often for woodland grazing. Native vegetation species common to this soil type include bur oak (*Quercus macrocarpa*), green ash (*Fraxinus pennsylvanica*), quaking aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), and Rocky Mountain juniper (*Juniperus scopulorum*) (NRCS 2009).

Badland: Badland is moderately steep to very steep barren land dissected by many intermittent drainage channels. Ordinarily, the areas are not stony. Badland is most common in semiarid and arid regions where streams cut into soft geologic material. Local relief generally ranges between 10 and 200 meters. Potential runoff is very high, and erosion is active. Badland occurs on the barren shoulders and backslopes of ridges. Patent soils occur on alluvial fans. This map unit occurs in badlands (NRCS McKenzie County, North Dakota, 2003).

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 (*Nasella viridula*), and other various herbs, forbs, and shrub species (NRCS 2009).

Parshall: The Parshall series consists of very deep, moderately rapidly permeable, well-drained soils found on 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 cultivation of small grains and other crops. Native vegetation species common to this soil type include needleandthread and other various medium and short prairie grasses (NRCS 2009).

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).

Shambo: The Shambo series consists of deep and very deep, well-drained, moderately permeable soils that formed in calcareous alluvium mainly from soft sandstone, mudstone, and shale. These soils are on terraces and fans along stream valleys and are on fans on uplands. Slope ranges from 0 to 35 percent. Mean annual air temperature is 42°F and mean annual precipitation is 15 inches. These soils are typically cropped to small grains, hay, and pasture; some areas with these soils are irrigated and some are in native rangeland. Native

vegetation includes green needlegrass, needleandthread, western wheatgrass, Junegrass (*Koeleria macrantha*), blue grama, and a variety of forbs (NRCS 2009).

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

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

Feature	Soil Series	Percentage of Location	Acres
Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H			
Access Road	Cabba loam, 15 to 45 percent slopes	35.04	2.827683
	Verbar fine sandy loams, 9 to 15 percent slopes	33.28	2.686108
	Verbar-Parshall fine sandy loams, 6 to 9 percent slopes	21.41	1.727867
	Rhoades silt loam, 0 to 6 percent slopes	10.27	0.828561
Dual Well Pad	Verbar-Parshall fine sandy loams, 6 to 9 percent slopes	98.63	4.478051
	Badland-Cabba-Arikara complex, 25 to 70 slopes	1.37	0.062021
Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H			
Access Road	Verbar fine sandy loams, 9 to 15 percent slopes	100	2.131177
Dual Well Pad	Verbar fine sandy loams, 9 to 15 percent slopes	100	4.570767
Fort Berthold # 148-95-3A-10-1H			
Access Road	Amor-Shambo loams, 3 to 6 percent slopes	69.70	0.685845
	Amor-Shambo loams, 3 to 6 percent slopes	30.29	0.298069
Dual Well Pad	Amor-Shambo loams, 3 to 6 percent slopes	97.03	2.504749
	Verbar-Parshall fine sandy loams, 6 to 9 percent slopes	2.90	0.076639

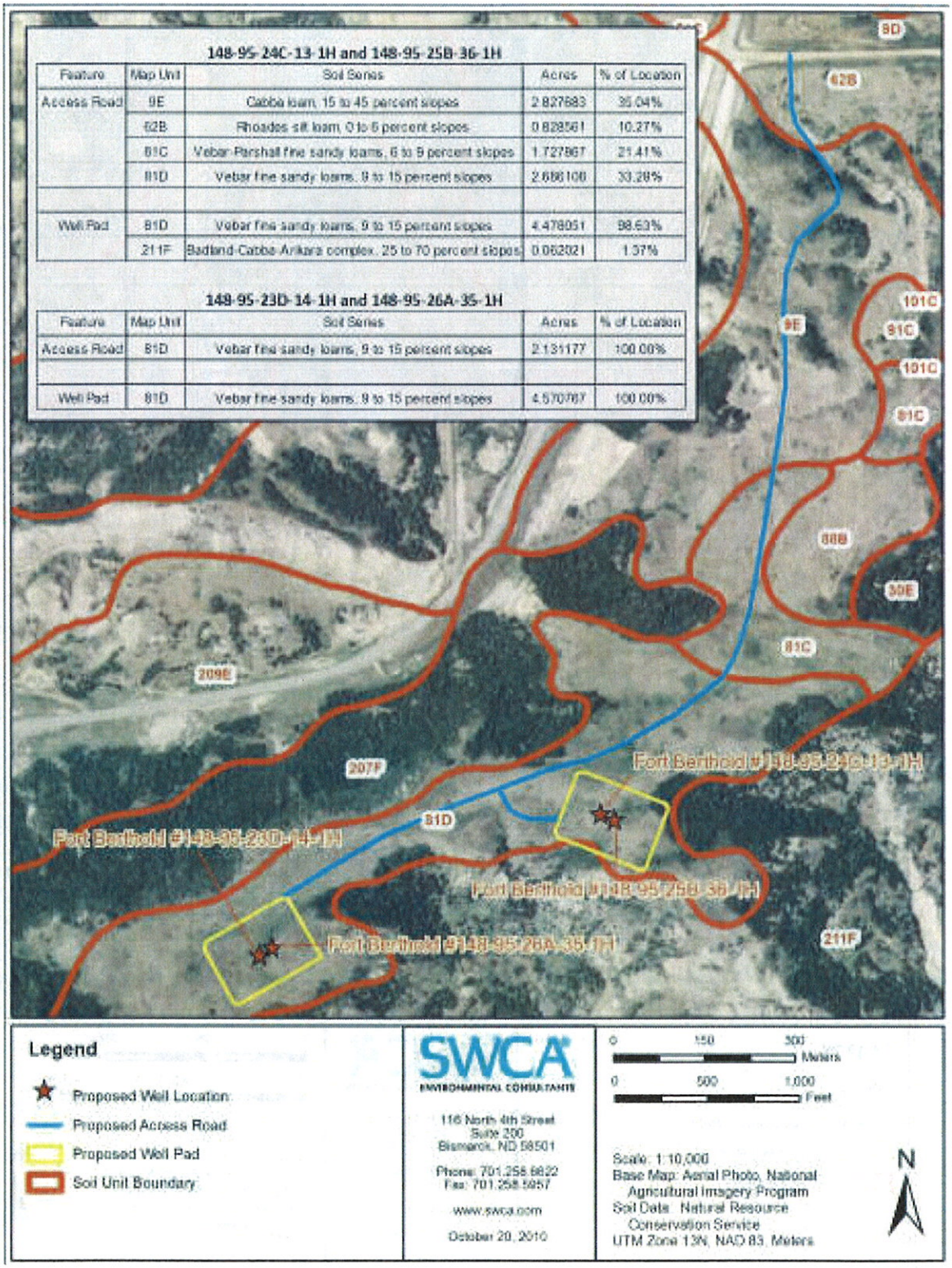
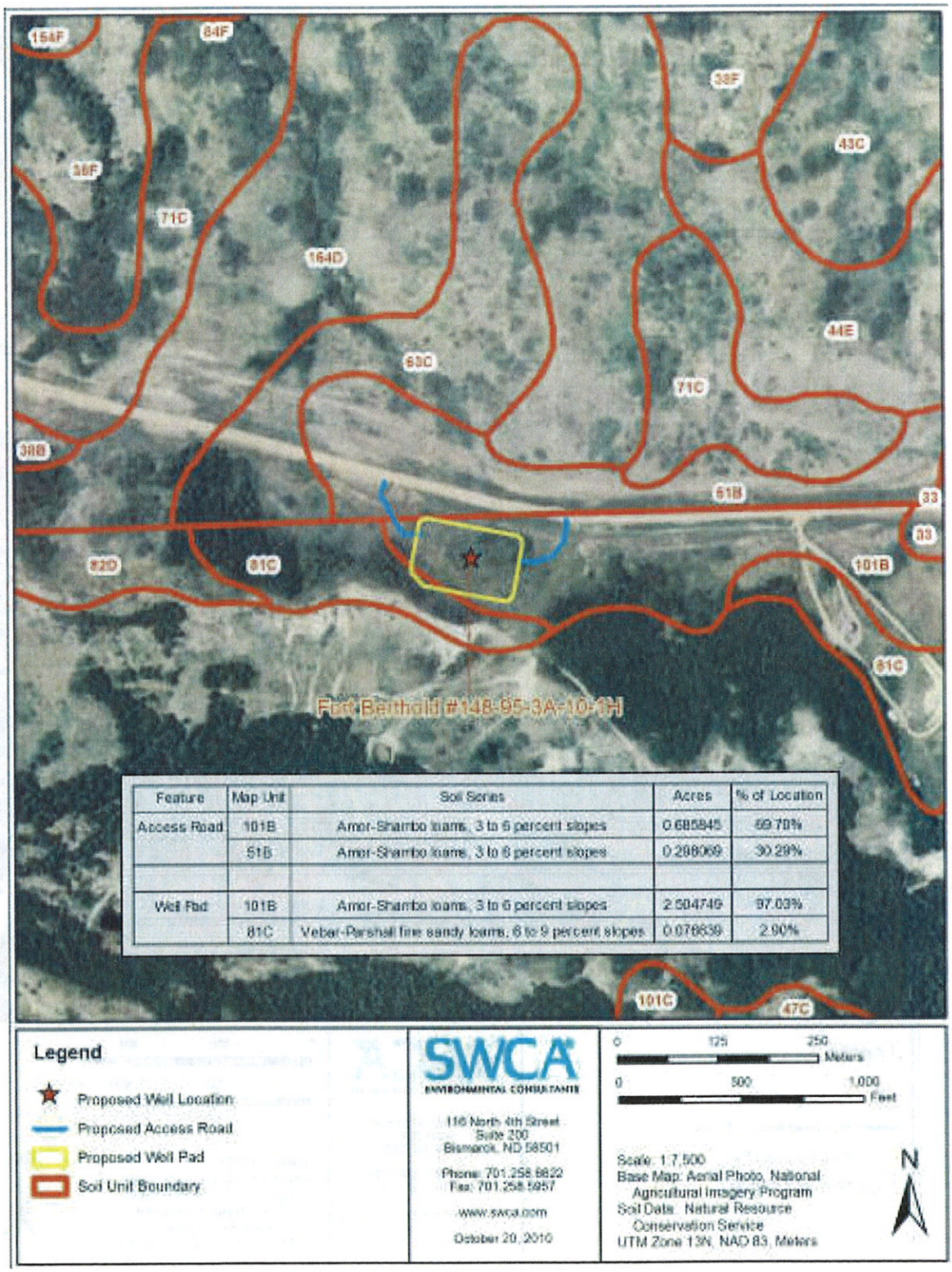


Figure 19. Approximate spatial extent of soil types in and around the dual well pads.



Feature	Map Unit	Soil Series	Acres	% of Location
Access Road	101B	Amor-Shambo loams, 3 to 6 percent slopes	0.685845	69.70%
	51B	Amor-Shambo loams, 3 to 6 percent slopes	0.298069	30.29%
Well Pad	101B	Amor-Shambo loams, 3 to 6 percent slopes	2.504749	97.03%
	81C	Veber-Parshall fine sandy loams, 6 to 9 percent slopes	0.076839	2.90%

Figure 20. Approximate spatial extent of soil types in and around the single well pad.

2.4.2 Field-derived Soil Data

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

Soil erodibility (or K Factor) indicates the vulnerability of material less than 2 millimeters in size to sheet and rill erosion by water. Values can range from 0.02 (i.e., lowest erosion potential) to 0.69 (i.e., greatest erosion potential).

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

Feature	Pit Depth (inches)	Soil Matrix Color (color name)	Redoximorphic Feature Color	Texture	Slope (%)	K Factor
Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H						
Well Pad	0–2	N/A	N/A	Duff	4%–5%	0.32
	2–15	10YR2/2	N/A	Loam		
	15–18	10YR3/2	N/A	Loam		
Shared Access Road	0–2	N/A	N/A	Duff	5%–7%	0.32
	2–15	10YR2/2	N/A	Loam		
	15–18	10YR3/2	N/A	Loam		
Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H						
Well Pad	0–4	N/A	N/A	Duff	5%–6%	0.32
	4–6	10YR2/1	N/A	Loam		
	6–20	10YR3/2 & 10YR2/1+	N/A	Loam		
Main Access Road	0–6	10YR3/2	N/A	Silty Clay Loam	5%–7%	0.32
	6–16	10YR4/3	N/A	Silty Clay Loam		
Fort Berthold #148-95-3A-10-1H						
Well Pad	0–10	10YR3/1 & 10YR4/2	N/A	Clay Loam	3%–4%	0.32
	10–20	10YR4/2 & 10YR2/1	N/A	Clay Loam		
Access Road	0–10	10YR3/1 & 10YR4/2	N/A	Clay Loam	3%–4%	0.32
	10–20	10YR4/2 & 10YR2/1	N/A	Clay Loam		

2.4.3 Conclusions Regarding Soil Erosion Potential

2.4.3.1 Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H

- The dual well pad is dominated (98.63%) by Verbar-Parshall fine sandy loams, and the proposed new access road is dominated (35.04%) by Cabba loam (Table 7).
- Both of these soils types have a moderate erosion potential, with slopes ranging between 6 and 9 percent for the Verbar-Parshall 15 to 45 percent for the Cabba loam (NRCS 2009).
- Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
- This location has a K Factor of 0.32. Using the Revised Universal Soil Loss Equation (RUSLE), there *could be* up to 96 tons/acre/year of soil loss from the dual well pad site and up to 6 tons/acres/year of soil loss on the access road 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.
- 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).

2.4.3.2 Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H

- The dual well pad and proposed new access road are lay completely within the Verbar fine sandy loams (Table 7).
- This soil type has a moderate erosion potential, with slopes ranging between 9 and 15 percent (NRCS 2009).
- Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
- This location has a K Factor of 0.32. Using the RUSLE, there *could be* up to 43 tons/acre/year of soil loss from the dual well pad site and up to 6 tons/acres/year of soil loss on the access road 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.
- The soil series is capable of supporting native short and mid grass prairie vegetative communities, which may substantially increase the probability for successful and permanent reclamation (NRCS 2009).

2.4.3.3 Fort Berthold #148-95-3A-10-1H

- The single well pad and proposed new access road are both dominated (97.03% and 69.7%, respectively) by the Amor-Shambo loams (Table 7).

- This soil type has a low erosion potential, with slopes ranging between 3 and 6 percent (NRCS 2009).
- Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
- This location has a K Factor of 0.32. Using the RUSLE, there *could be* up to 9 tons/acre/year of soil loss from the well pad site and a 6 tons/acres/year of soil loss on the access road 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.
- The soil series is capable of supporting native short and mid grass prairie vegetative communities, which may substantially increase the probability for successful and permanent reclamation (NRCS 2009).

2.4.3.4 General

The soil types are not expected to create unmanageable erosion issues or interfere with reclamation of the area. Proven BMPs are known to significantly reduce erosion of various types of soil, including those in the project area (BLM Instruction Memorandum 2004-124, www. blm.gov/bmp; BLM and USFS 2007; Grah 1997). Topsoil stripped from areas of new construction would be retained for use during reclamation. Any areas stripped of vegetation during construction would be reseeded once construction activities have ceased. The implementation of BMPs by the operator is projected to reduce and maintain negligible levels of erosion.

2.5 VEGETATION AND INVASIVE SPECIES

The proposed project area occurs in the Little Missouri Badlands level 4 ecoregion which contains a short-grass prairie ecosystem with forested areas found within draws on the north slopes of hills (Bryce et al. 1998). Native grasses include western wheatgrass (*Pascopyrum smithii*), blue grama (*Bouteloua gracilis*), little bluestem (*Schizachyrium scoparium*), and prairie sandreed (*Calamovilfa longifolia*). Common wetland vegetation includes various sedge species (*Carex* spp.), bulrush (*Scirpus* spp.), and cattails (*Typha* spp.). Common shrub, sapling, and tree species found in draws and on north slopes include green ash (*Fraxinus pennsylvanica*) and Rocky Mountain juniper (*Juniperus scopulorum*). Green ash may also be found in riparian zones with eastern cottonwood trees (*Populus deltoides*). Noxious weeds have the potential to detrimentally affect public health, ecological stability, and agricultural practices. The state of North Dakota recognizes 11 species as noxious; three of these recognized species are known to exist in Dunn County. Table 9 indicates the total acreage occupied by each noxious species known to exist in Dunn County. Additional information is available from the NRCS Plants Database for North Dakota at http://www.plants.usda.gov.

Table 9. Occupied Area for Recognized Noxious Weeds in Dunn County, North Dakota.

Common Name	Scientific Name	Dunn County (acres)
absinth wormwood	*Artemisia absinthium*	39,300
Canada thistle	*Cirsium arvense*	28,500
diffuse knapweed	*Centaurea diffusa*	0
leafy spurge	*Euphorbia esula*	18,300
musk thistle	*Carduus nutans*	0
purple loosestrife	*Lythrum salicaria*	0
Russian knapweed	*Acroptilon repens*	0
spotted knapweed	*Centaurea stoebe*	0
yellow toadflax	*Linaria vulgaris*	0
Dalmatian toadflax	*Linaria dalmatica*	0
salt cedar	*Tamarix ramosissima*	0

Source: North Dakota Department of Agriculture 2009.

2.5.1 Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H

Vegetation noted within the Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H project area includes fringed sage (*Artemisia frigida*), western sagewort (*A. campestris*), white sagebrush (*A. ludoviciana*), creeping juniper (*Juniperus horizontalis*), smooth brome (*Bromus inermis*), western snowberry (*Symphoricarpos occidentalis*), silver buffaloberry (*Shepherdia argentea*), little bluestem, and Rocky Mountain juniper.

2.5.2 Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H

Vegetation noted within the Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H project area includes fringed sage, smooth brome, western snowberry, blacksamson Echinacea (*Echinacea angustifolia*), little bluestem, and red threeawn (*Aristida sp.*). The noxious Russian knapweed (*Acroptilon repens*) was noted as being present in this area.

2.5.3 Fort Berthold #148-95-3A-10-1H

Vegetation noted within the Fort Berthold #148-95-3A-10-1H project area includes fringed sage, western sagewort, green needlegrass (*Nassela virdula*), white sagebrush, American elm (*Ulmus americana*), downy hawthorn (*Crataegus mollis*), silver buffaloberry (*Shepherdia argentea*), creeping juniper, and chokecherry (*Prunus virginianna*).

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

Evaluation of the existing vegetation during on-site assessments indicated Russian knapweed was present within the Fort Berthold #148-95-26A-35-1H and Fort Berthold #148-95-23D-14-1H project area. Potential new disturbance of approximately 23.5 acres and removal of existing vegetation from all three locations may facilitate the spread of invasive species. The APD and this EA require the operator to control noxious weeds throughout the project area. Surface disturbance and vehicular traffic must not take place outside approved ROWs or the well pad. Areas that are stripped of topsoil must be re-seeded and reclaimed at the earliest opportunity. Additionally, certified weed-free straw and seed must be used for all construction, seeding, and reclamation efforts. Prompt and appropriate construction, operation, and reclamation are expected to maintain minimal levels of adverse impacts to vegetation and will reduce the potential establishment of invasive vegetation species.

2.6 CULTURAL RESOURCES

Historic properties, or cultural resources, on federal or tribal lands are protected by many laws, regulations and agreements. The *National Historic Preservation Act of 1966* (16 USC 470 *et seq.*) at Section 106 requires, for any federal, federally assisted or federally licensed undertaking, that the federal agency take into account the effect of that undertaking on any district, site, building, structure or object that is included in the National Register of Historic Places (National Register) before the expenditure of any federal funds or the issuance of any federal license. Cultural resources is a broad term encompassing sites, objects, or practices of archaeological, historical, cultural and religious significance. Eligibility criteria (36 CFR 60.6) include association with important events or people in our history, distinctive construction or artistic characteristics, and either a record of yielding or a potential to yield information important in prehistory or history. In practice, properties are generally not eligible for listing on the National Register if they lack diagnostic artifacts, subsurface remains or structural features, but those considered eligible are treated as though they were listed on the National Register, even when no formal nomination has been filed. This process of taking into account an undertaking's effect on historic properties is known as "Section 106 review," or more commonly as a cultural resource inventory.

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

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

corresponds with the THPO regarding cultural resources on all projects proposed within the exterior boundaries of the Fort Berthold Reservation.

Cultural resource inventories of these well pads and access roads were conducted by personnel of SWCA Environmental Consultants, using an intensive pedestrian methodology. For the Fort Berthold #148-95-3A-10-1H project approximately 11.45 acres were inventoried on May 12, 2010 (Desruisseaux *et al.* 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 October 18, 2010 and the THPO concurred on October 21, 2010. For the Fort Berthold #148-95-26A-35-1H/Fort Berthold #148-95-23D-14-1H dual well pad project approximately 10.1 acres were inventoried on May 11, 2010 (Desruisseaux *et al.* 2010b), and for the Fort Berthold #148-95-24C-13-1H/Fort Berthold #148-95-25B-36-1H dual well pad project approximately 20.47 acres were inventoried between May 11 and August 3, 2010 (Lechert and Eisenhauer 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 archaeological site will be avoided. This determination was communicated to the THPO on October 26, 2010; however, the THPO did not respond within the allotted 30 day comment period.

2.7 PUBLIC HEALTH AND SAFETY

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.

Hydrogen sulfide is extremely toxic in concentrations above 500 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 hydrogen sulfide. 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.

Other potential adverse impacts from construction would be largely temporary. Noise, fugitive dust, and traffic hazards would be present for about 60 days 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 proves 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.

Tanker trips would depend on production, but Petro-Hunt 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.

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.

2.8 SOCIOECONOMICS

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

This section discusses community characteristics such as population, housing, demographics, employment, and economic trends taking place in 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.

2.8.1 Employment

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

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

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

U.S. Bureau of Economic Analysis 2009a.
* Bureau of Indian Affairs 2005. Represents 2005 data.

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

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

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

2.8.2 Income

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

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

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

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

According to the BIA, approximately 55% of tribal members living on or near the Reservation were employed, but living below federal poverty levels (BIA 2005).

Table 11. Income and Unemployment 2007

Unit of Analysis	Per Capita Income[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
North Dakota	36,082	$43,936	11.8%

[1] U.S. Bureau of Economic Analysis 2009b
[2] U.S. Department of Agriculture 2009
[3] North Dakota State Data Center 2009
N/A – Data not available.

2.8.3 Population

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

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

Table 12. Population and Demographics.

County or Reservation	Population in 2008	% of State Population	% Change Between 1990–2000	% Change between 2000–2008	Predomin-ant Group (%)	Predominant Minority (Percent of Total Minority Population)
Dunn	3,318	0.5	-10.1	-7.8	Caucasian (84.9%)	American Indian (15.1%)
McKenzie	5,674	0.8	-10.1	-1.1	Caucasian (76.3%)	American Indian (23.7%)
McLean	8,337	1.3	-11.0	-10.5	Caucasian (91.3%)	American Indian (8.7%)
Mountrail	6,511	1.0	-5.6	-1.8	Caucasian (62.8%)	American Indian (37.2%)
On or Near Fort Berthold 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 2009a.
[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.

2.8.4 Housing

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

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

construction has recently increased within much of the Analysis Area, but availability remains low.

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

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

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

Source: U.S. Census Bureau n.d.
N/A = Data not available.

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

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

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

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

Impacts to socioeconomic resources of the Analysis Area would be minimal and therefore would not adversely impact the local area. Short-term impacts to socioeconomic resources would generally occur during the construction/drilling and completion phases of the proposed wells. Long-term effects would occur during the production phase, should the wells prove successful. Impacts would be significant if the affected communities and local government

experienced an inability to cope with changes including substantial housing shortages, fiscal problems, or breakdown in social structures and quality of life.

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

Table 15. Duration of Employment during Proposed Project Implementation.

Activity	Duration of Activity (average days per well)	Daily Personnel (average number per well)
Construction (access road and well pad)	8–10 days	3–5
Drilling	35–40 days	8–15
Completion/Installation of Facilities	Approx. 10 days	3–8
Production	Ongoing – life of well	1–4

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

gas production, as well as a slight increase in generated taxes from the short-term operations. Mineral severance and royalty taxes, as well as other relevant county and Reservation taxes on production would also grow directly and indirectly as a result of increased industrial activity in the oil and gas industry.

2.9 ENVIRONMENTAL JUSTICE

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

The EPA headed the interagency workgroup established by the 1994 Executive Order and is responsible for related legal action. Working criteria for designation of targeted populations are provided in *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses* (EPA 1998). This guidance uses a statistical approach to consider various geographic areas and scales of analysis to define a particular population's status under the Executive 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 16 summarizes relevant data regarding minority and low-income populations for the Analysis Area.

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

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

Source: Northwest Area Foundation 2009.

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

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

Table 17. Poverty Rates for the Analysis Area.

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

Source: U.S. Census Bureau 2009d.
N/A = Data not available.

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-benefiting allottees. In addition to increased revenue for land and mineral holders, exploration and development would increase employment on the Reservation with oversight from the Tribal Employment Rights Office, which would help alleviate some of the poverty prevalent on or near the Reservation. Tribal members without either surface or mineral rights would not receive any direct benefits, except through potential employment, should they be hired. Indirect benefits of employment and general tribal gains would be the only potential offsets to negative impacts.

Additional potential impacts to tribes and tribal members include disturbance of cultural resources. There is potential for disproportionate impacts, especially if the impacted tribes and members do not reside within the Reservation and therefore do not share in direct or indirect benefits. This potential is reduced following the surveys of proposed well locations and access road routes and determination by the BIA that there would be no effect to historic properties. Furthermore, no resource is known to be present that qualifies as a TCP or for protection under the American Indian Religious Freedom Act. Potential for disproportionate impacts is further reduced by requirements for immediate work stoppage following an unexpected discovery of cultural resources of any type. Mandatory consultation would take place during any such work stoppage, affording an opportunity for all affected parties to assert their interests and contribute to an appropriate resolution, regardless of their home location or tribal affiliation.

The proposed project has not been found to pose a threat for significant impact to any other critical element, including air quality, public health and safety, water quality, wetlands, wildlife, soils, or vegetation within the human environment. Through the avoidance of such impacts, no disproportionate impact is expected to low-income or minority populations. The Proposed Action offers many positive consequences for tribal members, while recognizing EJ concerns. Procedures summarized in this document and in the APD are binding and sufficient. No laws, regulations, or other requirements have been waived; no compensatory mitigation measures are required.

2.10 MITIGATION AND MONITORING

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

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. Petro-Hunt 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.

2.10.1 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 chemical 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 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.

Petro-Hunt 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;

Petro-Hunt 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.

2.10.2 Mitigation and Safety Measures Committed to by Petro-Hunt

2.10.2.1 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.

2.10.2.2 Fire Control

Petro-Hunt 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.

2.10.2.3 Traffic

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

2.10.2.4 Wildlife

During an informal Section 7 consultation with the USFWS, the following mitigation measures were agreed upon to reduce the potential impact to protected species.

- Whooping Cranes: If a whooping crane is sighted within 1 mile of the proposed project area, work will be stopped and the USFWS will be notified. Work will start again after the whooping crane has left the area.
- Migratory Birds: If construction will occur during the breeding season (February 1 to July 15), Petro-Hunt will have a biologist survey the project area five days before construction begins or the grass will be maintained by mowing within the project location (access road and well pad) prior to the breeding season to deter migratory birds from nesting in the project area.

2.10.2.5 Cultural Resources

Petro-Hunt recognizes the need to protect cultural resources on the project locations and has committed to the following:

- Avoiding, as recommended, all identified National Register eligible or unevaluated cultural resources. Buffers would be placed between eligible or unevaluated cultural resources and the proposed infrastructure (5-acre well pad or 66-foot-wide access road construction corridor). When avoidance buffers of 50 feet or greater cannot be achieved due to project design constraints, temporary fencing is recommended along the edge of the construction corridor and monitoring by a qualified archaeologist is recommended during all ground-disturbing activities to ensure that inadvertent impacts to cultural resources are avoided.
- Prohibiting all project workers from collecting artifacts or disturbing cultural resources in any area under any circumstances.
- Avoiding impacts to National Register eligible or unevaluated cultural resources on well sites and access roads.

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.

2.10.2.6 Additional Commitments

Petro-Hunt commits to the following:

- A liner, exhibiting a minimum thickness of 12mm, will be installed in all reserve pits.
- Topsoil will be placed to divert flow away from well pad location to limit the potential of surface contamination
- Reclaim, including revegetate, disturbed areas not actively used for operations/drilling after initial construction
- Erosion control devices will be implemented as necessary to control surface water contamination from sediment transport.

- The reserve pits will be netted after the initial drilling and will remain in place until final closure.
- A semi-closed loop system will be utilized for both proposed dual well pads wells.
- Any free-fluids found in the reserve pit will be immediately removed.
- Utility and electrical lines will be constructed and maintained underground.
- Tanks will be diked with a four foot berm.
- Split the top soil piles so that the piles are stored on separate sides of the proposed well pads.
- Round the corners of both dual well pads.
- Build a catchment pond at the base of the downhill slope side of the Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H dual well pad to reduce sloughing.

2.11 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

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

2.12 SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

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

2.13 CUMULATIVE IMPACTS

Environmental impacts may accumulate either over time or in combination with similar events in the area. Unrelated and dissimilar activities may also have negative impacts on critical elements, thereby contributing to the cumulative degradation of the environment. Past and current disturbances near the project area include farming, grazing, roads, and other oil and gas wells. Reasonably foreseeable future impacts must also be considered. Should development of these wells prove productive, it is likely that Petro-Hunt 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 occurred 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 currently the dominant activity in the area, oil and gas development is not expected to have more than a minor cumulative effect on land use patterns.

No wells occur within 1 mile of project location (Table 18). There are 23, 178, and 635 oil and gas wells (combined active, confidential, and permitted) within 5, 10, and 20 miles, respectively, of the proposed project area (Tables 19 through 21; Figure 21).

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

	Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H		Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H		Fort Berthold #148-95-3A-10-1H	
Reservation (on/off)	On	Off	On	Off	On	Off
Confidential Wells	0	-	0	-	0	-
Active Wells	0	-	0	-	0	-
Permitted Wells	0	-	0	-	0	-

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

	Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H		Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H		Fort Berthold #148-95-3A-10-1H	
Reservation (on/off)	On	Off	On	Off	On	Off
Confidential Wells	5	1	5	1	9	1
Active Wells	4	1	4	2	5	1
Permitted Wells	0	0	0	0	0	1

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

	Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H		Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H		Fort Berthold #148-95-3A-10-1H	
Reservation (on/off)	On	Off	On	Off	On	Off
Confidential Wells	26	18	25	19	29	33
Active Wells	15	39	15	42	17	69
Permitted Wells	1	0	1	0	1	0

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

	Fort Berthold #148-95-24C-13-1H & Fort Berthold #148-95-25B-36-1H		**Fort Berthold #148-95-26A-35-1H & Fort Berthold #148-95-23D-14-1H**		**Fort Berthold #148-95-3A-10-1H**	
Reservation (on/off)	On	Off	On	Off	On	Off
Confidential Wells	58	112	57	112	72	125
Active Wells	47	324	45	324	57	329
Permitted Wells	2	1	2	1	3	1

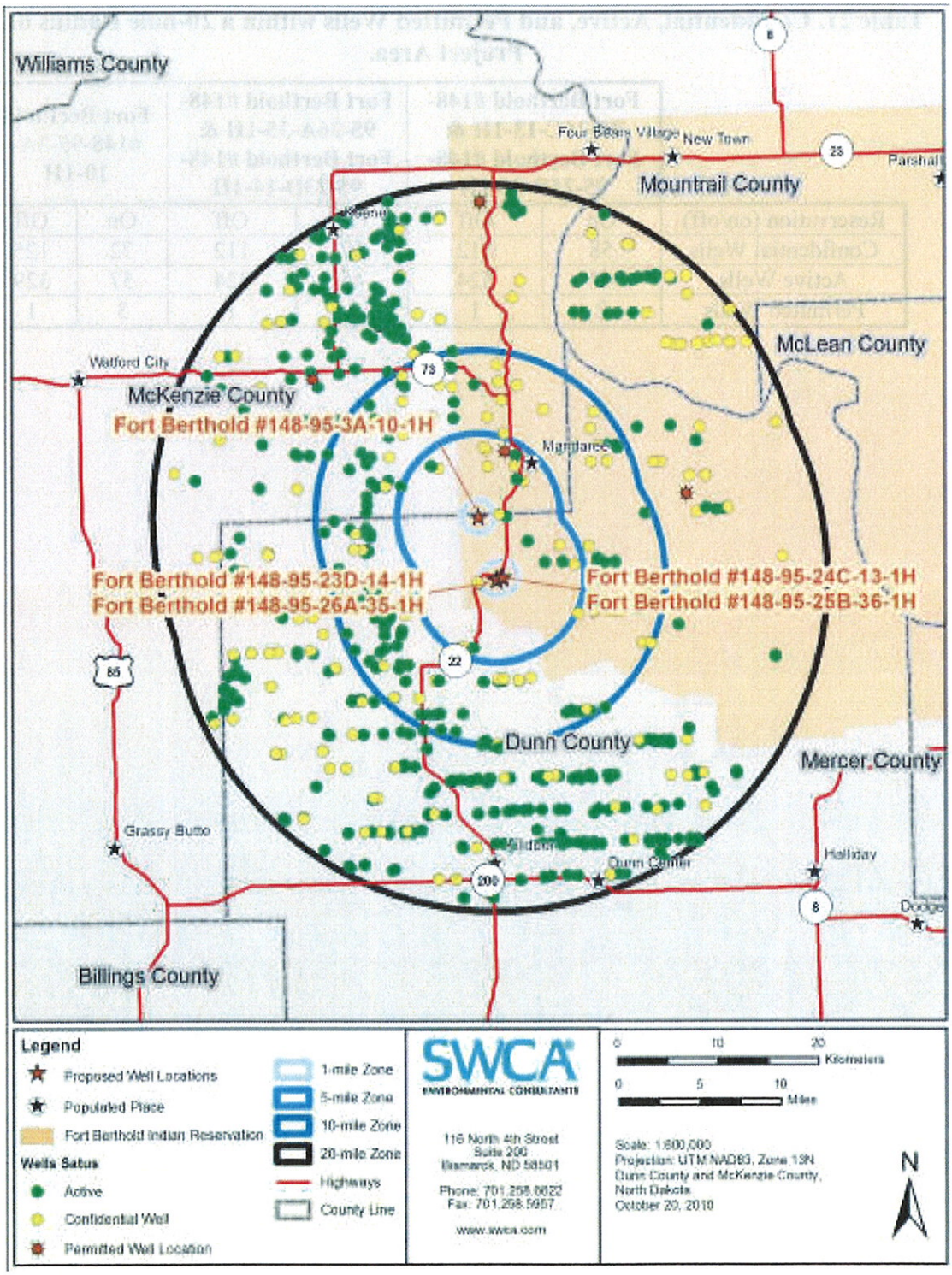


Figure 21. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the proposed project locations.

Within the Reservation and near the proposed project area, development projects remain few and widely dispersed. 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.

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

No surface discharge of water would occur under the Proposed Action, nor would any surface water or groundwater be used during project development. The Proposed Action, when combined with other actions (cattle grazing, other oil and gas development, and agriculture) that are likely to occur in and near the project area in the future, would increase sedimentation and runoff rates. Sediment yield from active roadways could occur at higher rates than background rates and continue indefinitely. Thus, the Proposed Action could incrementally add to existing and future sources of water quality degradation in the Lower Missouri River, but increases in degradation would be reduced by Petro-Hunt'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, Petro-Hunt is committed to using BMPs to mitigate these effects. BMPs would include implementing erosion and sedimentation control measures such as installing culverts with energy-dissipating devices at culvert outlets to avoid sedimentation in ditches, constructing water bars alongside slopes, and planting cover crops to stabilize soil following construction and before permanent seeding takes place.

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

Significant archaeological resources are irreplaceable and often unique; any destruction or damage of such resources can be expected to diminish the archaeological record as a whole. However, no such damage or destruction of significant archaeological resources is anticipated

as a result of the Proposed Action because these resources would be avoided, negating the cumulative impacts to the archaeological record.

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

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

3.0 CONSULTATION AND COORDINATION

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

Table 22. Scoping Comments

Name	Organization	Comment	Response to Comment
Bagley, Lonny	BLM	No Comment	
Benson, Barry	MHA Nation	No Comment	
Bercier, Marilyn	BIA	No Comment	
Berg, George	NoDak Electric Cooperative, Inc.	No Comment	
Black, Mike	BIA	No Comment	
Boyd, Bill	Midcontinent Cable Company	No Comment	
Brady, Perry	THPO, Three Affiliated Tribes	No Comment	
Brien, David	Chairman, Turtle Mountain Band of Chippewa	No Comment	
Brugh, V. Judy	MHA Nation	No Comment	
Bryan, Kelly	Zenergy Operating Company, LLC	No Comment	
Cayko, Richard	McKenzie County	No Comment	
Cimarosti, Dan	USACE	Enclosed Section 10 Application incase a permit is required.	Fort Berthold 148-95-26A-35-1H will require a Section 10 Application. A complete permit application will be submitted to USACE.
U.S. Army Corps of Engineers, Omaha District	Garrison Project Office	No Comment	
Danks, Marvin	Fort Berthold Rural Water Director	No Comment	
Dhieux, Joyce	EPA	No Comment	
Director, Insurance & Hazard	Federal Emergency Management Agency	No Comment	
Dixon, Doug	Montana Dakota Utilities	No Comment	
Dressler, Patricia L.	FAA	No objection provided the FAA is notified of construction or alterations as required by Federal Aviation Regulations.	If required, the FAA will be notified.

Name	Organization	Comment	Response to Comment
Erhardt, Toni	USACE - Bismarck	No Comment	
Erickson, Carroll	Ward County Board of Commissioners	No Comment	
Flores, J.R.	U.S. Department of Agriculture	No Comment	
Fox, Fred	MHA Nation	No Comment	
Glatt, David	NDDH	Impacts will be minor and can be controlled by proper construction methods.	BMPs discussed in APD and will be covered in Conditions of Approval.
Glover, John	NRCS	No Comment	
Gorton, Candace	USACE	No Comment	
Guzman, Frank	USFS	No Comment	
Hall, Todd	MHA Nation	No Comment	
Hanson, Jesse	North Dakota Parks and Recreation	No known occurrences of historic plant or species of concern or other significant ecological communities are known to occur within an approximate one mile radius of the project area. Reclaim the area with native vegetation; Create the least amount of visual impact as possible near the Killdeer Mountain Four Bears Scenic Byway.	See Reclamation section
Hauck, Reinhard	Dunn County	No Comment	
Hefferman, Dan	EPA	No Comment	
His Horse Is Thunder, Ron	Chairman, Standing Rock Sioux Tribe	No Comment	
Hoffman, Warren	Killdeer, Weydahl Field	No Comment	
Hovda, Roger	Reservation Telephone Cooperative	No Comment	
Hudson-Schenfisch, Julie	McLean County Board of Commissioners	No Comment	

Name	Organization	Comment	Response to Comment
Hynek, David	Chair, Mountrail Board of County Commissioners	No Comment	
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	
Kyner, Dave	FEMA	FEMA's major concern is whether the property is located within a mapped Special Flood Hazard Area.	The project area is not located in a floodplain.
Land Department	Northern Border Pipeline Company	No Comment	
Latimer, Tom	Red Willow Great Plains, LLC	No Comment	
Laux, Eric	USACE	No Comment	
Lindemann, Larry	Airport Manager, Barnes County Municipal Airport	No Comment	
Manager	Xcel Energy	No Comment	
Massad, Mary	Southwest Water Authority	No Comment	
McKenna, Michael	North Dakota Game and Fish Department	Recommend construction be avoided were possible in native prairie, wooded draws, riparian areas, and wetlands. Botanical and raptor surveys suggested.	See Wildlife, Wetlands, and Vegetation sections in the EA. BMPs discussed in APD and will be covered in Conditions of Approval.
Melhouse, Ronald D.	U.S. Bureau of Reclamation	The proposed well pad is located in the vicinity of the rural water pipeline. Consult with Marvin Danks, Fort Berthold Rural Water Director.	Operator has been advised. All future pipeline construction which crosses the rural water pipeline must do so per the requirements of the Bureau of Reclamation.
Mercer County	Mercer County Board of Commissioners	No Comment	
Missile Engineer, Chief	Minot Air Force Base	No Comment	
NAGPRA Office	MHA Nation	No Comment	
Nash, Mike	BLM	No Comment	

Name	Organization	Comment	Response to Comment
Natural Resources Department	MHA Nation	No Comment	
Nelson, Richard	U.S. Bureau of Reclamation	No Comment	
Nordquist, Don	Petro-Hunt, LLC	No Comment	
Obenauer, Steve	FAA	No Comment	
Olson, Frances	McKenzie County	No Comment	
Paaverud, Merl	State Historical Society	Request a copy of site forms and reports.	See Cultural Resources section.
Packineau, Mervin	MHA Nation	No Comment	
Paulson, Gerald	Western Area Power Administration	No Comment	
Pearson, Myra	Spirit Lake Sioux Tribe	No Comment	
Peterson, Walter	North Dakota Department of Transportation	No Comment	
Poitra, Fred	MHA Nation	No Comment	
Prchal, Doug	North Dakota Parks and Recreation Department	No Comment	
Representative, Mandaree Segment	MHA Nation	No Comment	
Rudolph, Reginald	McLean Electric Cooperative, Inc.	No Comment	
Schelkoph, David	West Plains Electric Cooperative, Inc.	No Comment	
Selvage, Michael	Chairman, Sisseton-Wahpeton Sioux Tribe	No Comment	
Shortbull, Marietta	Fort Berthold Agency	No Comment	
Smith, Heather	EOG Resources, Inc.	No Comment	

Name	Organization	Comment	Response to Comment
Sorensen, Charles	USACE	Petro Hunt LLC should consider the construction/establishment of a catch trench located on the down sloping side of the well pad. Due to close proximity to the Little Missouri River, a closed loop system is recommended; living quarter's sewage systems have a closed system, Petro-Hunt, LLC obtains proper permits, and fill is certified as weed-free.	Operator has been advised. No closed loop system will be required but both dual pads will utilize a semi-closed loop system. The BIA and BLM will monitor the sites during all proposed activities to ensure BMPs are acting to reduce or eliminate the potential for adverse impact to the Lower Little Missouri Watershed.
Svoboda, Larry	EPA	No Comment	
Sweeney, Paul J.	NRCS	Farmland Protection Policy Act does not apply to this area and NRCS recommends wetlands are avoided.	No wetlands are located in the project area.
Thompson, Brad	USACE	If dredge or fill material is placed into waters of the US, a Section 404 permit is required.	No fill will be placed in waters of the U.S.
Thorson, Gary	McKenzie Electric Cooperative	No Comment	
Towner, Jeffrey	USFWS	The service concurs with SWCA's findings regarding Threatened and Endangered Species, Migratory Birds, and the Bald & Golden Eagle Protection Act.	Concurrence letter is included in the EA.
Chevance, Nick	National Park Service, Midwest Region	No Comment	
Wells, Marcus	Chairman, MHA Nation	No Comment	
Whitcalf, Frank	MHA Nation	No Comment	
Williams, Damon	MHA Nation	No Comment	
Wolf, Malcolm	MHA Nation	No Comment	

List of Preparers

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

Petro-Hunt, LLC

- Jeff Herman, Regional Land Manager
- Don Nordquist, Senior Landman

SWCA Environmental Consultants

- Judith Cooper, Archaeologist/ Principal Investigator
  Prepared and reviewed cultural reports.
- Michael J. Cook, Ecologist/Project Manager
  Conducted natural resource surveys for the well pad and the access road. Contributed to the preparation of the EA. Reviewed the EA.
- Danielle Desruisseaux, Archaeologist
  Completed cultural reports.
- Nancy Eisenhauer, Archaeologist
  Completed cultural report.
- Alan Hutchinson, Archaeologist
  Completed field surveys.
- Nelson Klitzka, Archaeologist
  Completed field surveys.
- Stephanie Lechert, Archaeologist
  Prepared cultural reports and completed field surveys.
- Matt Loscalzo, Natural Resource Planner
  Completed socioeconomic and environmental justice sections of EA.
- Jon Markman, Archaeologist/Field Coordinator
  Conducted cultural resource surveys for well pads and access roads.
- Chris McLaughlin, Ecologist
  Prepared the EA. Competed limited field survey.
- Trent Reeder, Geospatial Specialist
  Created maps and provided spatially derived data calculations.

- Sarah Ruffo, Environmental Specialist
  Prepared scoping letter and distributed scoping package. Authored limited portions of the EA.
- Mike Retter, Archaeologist/ Principal Investigator
  Reviewed cultural reports.
- Joey Sheeley, Planning Specialist
  Assisted calculating Soil K Factors
- Nicholas Smith, Archaeologist
  Completed field surveys.
- Richard Wadleigh, NEPA Coordinator
  Final review of EA.

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5.0 ACRONYMS

°F	degrees Fahrenheit
APD	application for permit to drill
APE	area of potential effect
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	environmental assessment
EIS	environmental impact statement
EJ	environmental justice
EPA	Environmental Protection Agency
ESA	Endangered Species Act
GHG	greenhouse gas
HAP	hazardous air pollutant
HUC	hydrologic unit code
MHA Nation	Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara Nation
NAGPRA	Native American Graves Protection and Repatriation Act
NDCC	North Dakota Century Code
NDDH	North Dakota Department of Health
NDIC	North Dakota Industrial Commission
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
PEM	palustrine emergent
ROW	right-of-way
SHPO	State Historic Preservation Officer
TCP	traditional cultural property
THPO	Tribal Historic Preservation Officer
TMD	total measured depth
TVD	total vertical depth
USC	United States Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound

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

OCT 18 2010

IN REPLY REFER TO:
DESCRM
VAC-208

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 an oil well pad and access road in Dunn and McKenzie Counties, North Dakota. Approximately 11.45 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 which 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-1744/FB/10**, the proposed undertaking, location, and project dimensions are described in the following report:

Desrosseaux, Danielle, Stephanie Lechert and Judith Cooper
(2010) A Class I and Class III Cultural Resource Inventory of the Petro-Hunt Fort Berthold 148-95-3A-10-1H Well Pad and Access Road, Dunn and McKenzie Counties, North Dakota. SWCA Environmental Consultants for Petro-Hunt, L.L.C. Bismarck.

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

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OCT 26 2010

IN REPLY REFER TO:
DESCRM
MC-208

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 two dual oil well pads and access roads in Dunn County, North Dakota. Approximately 30.57 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the areas depicted in the enclosed reports. One archaeological site (32DU1535) was located which 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 these undertakings, as site 32DU1535 can and will be avoided. Catalogued as **BIA Case Number AAO-1744/FB/10,** the proposed undertakings, locations, and project dimensions are described in the following reports:

Desruisseaux, Danielle, Stephanie Lechert and Judith Cooper
(2010) A Class I and Class III Cultural Resource Inventory of the Petro-Hunt Fort Berthold 148-95-26A-35-1H and Fort Berthold 148-95-23D-14-1H Dual Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for Petro-Hunt, LLC, Bismarck.

Lechert, Stephanie, and Nancy F. Eisenhauer
(2010) A Class I and Class III Cultural Resource Inventory of Petro-Hunt's Fort Berthold 148-95-24C-13-1H/Fort Berthold 148-95-25B-36-1H Dual Well Pad and Access Road, Dunn County, North Dakota. SWCA Environmental Consultants for Petro-Hunt, LLC, Bismarck.

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

Three Affiliated Tribes
MANDAN * HIDATSA * ARIKARA

TRIBAL HISTORIC PRESERVATION
Mandan Hidatsa Arikara
Perry 'No Tears' Brady, Director,
404 Frontage Road,
New Town, North Dakota 58763
Ph/701-862-2474 fax/701-862-2490
pbrady@mhanation.com

October 21, 2010

RECEIVED
OCT 25 2010
DESCRM

Carson Murdy
Great Plains Regional Office
115 Fourth Avenue S.E.
Aberdeen, South Dakota 57401

RE: Recommendation and Concurrence:

As Director of the Tribal Historic Preservation Office and the Tribal Historical Preservation Officer representing the Mandan Hidatsa Arikara **Nation I Concur with the BIA Case Number AAO-1744/FB/10**

Desriosseaix, Danielle, Stephanie Lechert and Judith Cooper
(2010) A Class I and Class III Cultural Resource Inventory of the Petro-Hunt Fort Berthold 148-95-3A-10-1H Well Pad and Access Road, Dunn and McKenzie Counties, North Dakota. SWCA Environmental Consultants for Petro-Hunt, LLC, Bismarck.

If you have any questions or need additional information, you can contact me at the THPO at anytime.

Sincerely:

Perry 'No Tears' Brady
THPO Director

Cc.file
MC

United States Department of the Interior

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

OCT 19 2010

Mr. Michael Cook, Ecologist
SWCA Environmental Consultants
116 North 4th Street, Suite 200
Bismarck, North Dakota 58501

Re: Request for Review and Concurrence on Petro-Hunt Proposed Wells, Ft. Berthold Reservation, Dunn County, North Dakota

Dear Mr. Cook:

This is in response to your August 6, 2010, and subsequent October 13, 2010, email correspondence with Heidi Riddle of my staff regarding your request for review and concurrence for five proposed exploratory oil and gas wells on three pads, proposed to be drilled and completed by Petro-Hunt, LLC (Petro-Hunt) on the Fort Berthold Reservation, Dunn County, North Dakota.

Specific location for the proposed Petro-Hunt single pad is:

Fort Berthold 148-95-3A-10-1H: T. 148 N., R. 95 W., Section 3, Dunn County.

Specific locations for the proposed Petro-Hunt dual pads are:

Fort Berthold 148-95-26A-35-1H and Fort Berthold 148-95-23D-14-1H : T. 148 N., R. 95 W., Section 23, Dunn County.

Fort Berthold 148-95-24C-13-1H and Fort Berthold 148-95-25B-36-1H: T. 148 N., R. 95 W., Section 24, Dunn County.

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", and the Endangered Species Act (16 U.S.C. 1531 et seq.) (ESA).

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.

Single Pad, Fort Berthold 148-95-3A-10-1H

The Service acknowledges your "no effect" determination for piping plover and interior least tern. Normally, a "no effect" determination requires no further consultation. However, when determining if an action may affect a listed species, the Federal agency must include direct and indirect effects, as well as those actions that are interrelated or interdependent. The Service remains concerned about potential contamination of Lake Sakakawea due to surface spills that could result in the transfer of fluids through drainages which empty into the lake, as well as reserve pit leachate. We recognize that potential impacts to listed species have been minimized with the implementation of containment measures with berms and booms, as well as the distance of the proposed wells from Lake Sakakawea. The Service believes these measures reduce, but do not eliminate the potential for adverse effects to listed species. The Service also remains concerned with potential impacts that the interrelated and interdependent actions of oil and gas exploration could have on plovers and terns. A recent study indicates that least terns may travel up to 30 miles or more to forage during the nesting season. The Service suggests that a determination of "may affect, not likely to adversely affect" for these three federally listed species is the correct determination, and one that we would concur with.

The Service concurs with your "may affect, is not likely to adversely affect" determination for whooping cranes. This concurrence is predicated on Petro-Hunt'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.

The Service concurs with your "may affect, not likely to adversely affect" determination for gray wolf.

The Service acknowledges your no effect determination for pallid sturgeon and black-footed ferret.

Dual Pad, Fort Berthold 148-95-26A-35-1H and Fort Berthold 148-95-23-14-1H
Dual Pad, Fort Berthold 148-95-24C-13-1H and Fort Berthold 148-95-25B-36-1H

The Service concurs with your "may affect, is not likely to adversely affect" determination for piping plovers, interior least terns, and pallid sturgeon. This

concurrence is predicated on Petro-Hunt's placement of the dual pads approximately ten miles from Lake Sakakawea.

The Service concurs with your "may affect, is not likely to adversely affect" determination for whooping cranes. This concurrence is predicated on Petro-Hunt'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.

The Service concurs with your "may affect, not likely to adversely affect" determination for gray wolf.

The Service acknowledges your no effect determination for black-footed ferret.

Migratory Birds and Bald and Golden Eagle Protection Act

Your correspondence states that Petro-Hunt will implement the following measures to avoid/minimize take of migratory birds:

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

Your letter states that no eagles or nests were discovered within 0.5 mile of the project area. There is a documented golden eagle nest located northwest of the project area; however, your October 18, 2010 , email response to Heidi Riddle of my staff indicates that the nest is over one mile from the nearest proposed pad site.

The Service believes that Petro-Hunt'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 EA. 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,

for Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

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

Notice of Availability and Appeal Rights

Petro-Hunt: Fort Berthold #148-95-24C-13-1H, Fort Berthold #148-95-25B-36-1H
Fort Berthold #148-95-26A-35-1H, Fort Berthold #148-95-23D-14-1H
Fort Berthold #148-95-3A-10-1H

The Bureau of Indian Affairs (BIA) is planning to issue administrative approvals for five proposed exploratory oil and gas wells on the Fort Berthold Reservation as shown on the attached map. Construction by Petro-Hunt is expected to begin in the Winter 2010.

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

The FONSI is only a finding on environmental impacts – it is not a decision to proceed with an action and *cannot* be appealed. BIA's decision to proceed with administrative actions *can* be appealed until January 6, 2010, by contacting:

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

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

Project locations.