

Environmental Assessment

D-3 Dancing Bull #4-8H

D-3 Elk #4-16H

D-3 Shell Creek #4-7H

D-3 T. Smith #16-3H

Prepared for:



Zenergy Operating Company, LLC

September 2009

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

**Four Bakken Exploratory Oil Wells:
D-3 Dancing Bull #4-8H
D-3 Elk #4-16H
D-3 Shell Creek #4-7H
D-3 T. Smith #16-3H**

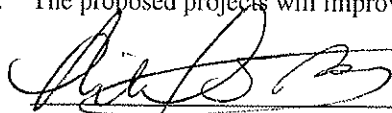
**Fort Berthold Indian Reservation
McLean and Mountrail County, North Dakota**

The U.S. Bureau of Indian Affairs (BIA) has received a proposal for four oil/gas wells, access roads and related infrastructure on the Fort Berthold Indian Reservation to be located in Section 8, T150N, R92W, Section 16, T150N, R92W, Section 7, T150N, R91W, and Section 3, T150N, R92W. Associated federal actions by BIA include determinations of effect regarding cultural resources, approvals of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Applications for Permit to Drill.

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

This determination is based on the following factors:

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



Regional Director

10-1-09
Date

Environmental Assessment

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D-3 T. Smith #16-3H

Zenergy Operating Company, LLC

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1.0 Purpose and Need for the Proposed Action

Zenergy Operating Company, LLC (Zenergy) is proposing to drill four horizontal oil/gas wells on the Fort Berthold Indian Reservation to evaluate and potentially develop the commercial potential of natural resources. The U.S. Bureau of Indian Affairs (BIA) is the surface management agency for potentially affected tribal lands and individual allotments. The BIA also holds title to subsurface mineral rights. Developments are proposed on lands held in trust by the United States in McLean and Mountrail Counties, North Dakota (Figure 1). The proposed well sites are:

- D-3 Dancing Bull #4-8H
- D-3 Elk #4-16H
- D-3 Shell Creek #4-7H
- D-3 T. Smith #16-3H

The economic development of available resources and associated BIA actions are consistent with BIA's general mission. Leasing and development of mineral resources offers substantial economic benefits to both the Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara Nation and to individual tribal members. Oil and gas exploration and development activities are conducted under authority of the Indian Mineral Leasing Act of 1938 (25 USC 396a, *et seq.*), the Indian Mineral Development Act of 1982 (25 USC 2101, *et seq.*), the Federal Onshore Oil and Gas Royalty Management Act of 1982 (30 USC 1701, *et seq.*), and the Energy Policy Act of 2005 (42 USC 15801, *et seq.*). BIA actions in connection with the proposed projects are largely administrative and include approval of leases, easements and rights-of-way, determinations regarding cultural resource effects and recommendations to the Bureau of Land Management (BLM) regarding approval of Applications for Permit to Drill (APDs).

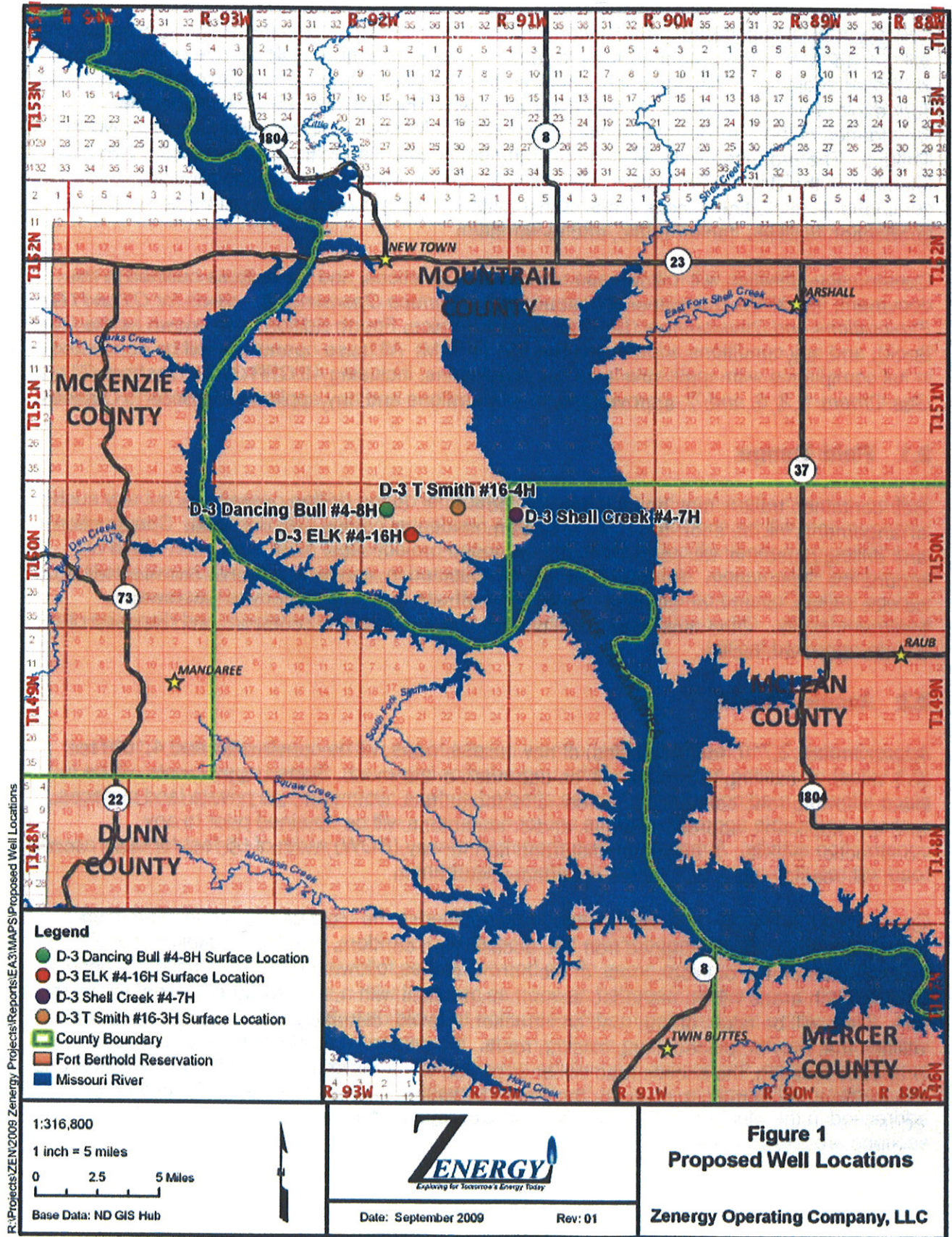
These proposed federal actions require compliance with the *National Environmental Policy Act* of 1969 (NEPA) and regulations of the Council on Environmental Quality (CEQ, 40 CFR 1500-1508). Analysis of the proposed project's potential to impact the human environment will be documented and will guide federal decision making. APDs submitted by Zenergy included in Section 7 of this document, describes developmental, operational and reclamation procedures and practices that contribute to the technical basis of this Environmental Assessment (EA). The procedures and practices described in the application are critical elements in both the project proposals and the BIA's decision regarding environmental impacts. This EA will result in either a Finding of No Significant Impact (FONSI) or a decision to prepare an Environmental Impact Statement (EIS).

There are several components to each of the proposed actions. Both new and improved roads are needed to access proposed well sites. Well pads will be constructed to accommodate drilling operations. Pits for drill cuttings will be constructed, used, and reclaimed. Drilling and completion information can result in long-term commercial production at some or all of the sites, in which case supporting facilities will be installed. The working portions of well pads and the access roads will remain in place during commercial production. All project components will eventually be abandoned and reclaimed, as specified in this document and the APDs and according to any other federal conditions, unless formally transferred with federal approval to either the BIA or the landowner. The proposed wells are exploratory, in that results can also support developmental decisions on other leases in the surrounding area, but this EA addresses only the installation and possible long-term operation of the listed wells and directly associated

infrastructure and facilities. Additional NEPA analysis, decisions, and federal actions will be required prior to any other developments.

Any authorized project will comply with all applicable federal, state, and tribal laws, rules, policies, regulations, and agreements. No construction, drilling, or other ground-disturbing operations will begin until all necessary leases, easements, surveys, clearances, consultations, permissions, determinations, and permits are in place.

Figure 1. Proposed Well Locations.



2.0 Proposed Action and Alternatives

The **No Action Alternative** must be considered within an EA. If this alternative is selected, BIA will not approve leases, rights-of-way, or other administrative proposals for one or more of the proposed projects. This document analyzes the potential impacts of specific proposed projects, four exploratory oil/gas wells on mixed surface ownership and mineral estate within the boundaries of the Fort Berthold Indian Reservation in McLean and Mountrail Counties, North Dakota. The proposed wells will test the commercial potential of the Middle Bakken Dolomite Member of the Bakken Formation. Site-specific actions will or might include several components, including access roads, construction of well pads, drilling operations, installation of production facilities, tanker traffic, and reclamation.

Construction activities will follow lease stipulations, practices, and procedures outlined in this document, the APDs, guidelines and standards in *Surface Operating Standards for Oil and Gas Explorations and Development* (BLM/US Forest Service, Fourth Edition, also known as the Gold Book), and any conditions added by either BIA or BLM. All lease operations will be conducted in full compliance with applicable laws and regulations, including 43 CFR 3100, *Onshore Oil and Gas Orders 1, 2, 6, and 7*, approved plans of operations and any applicable Notices to Lessees.

2.1 Field Camps

Self-contained trailers may house a few key personnel during drilling operations, but any such arrangements will be short-term. No long-term residential camps are proposed. Construction and drilling personnel will commute to the proposed project sites, most likely from within or around the Reservation. Human waste will be collected in standard portable chemical toilets or service trailers located on-site, then transported off-site to a state-approved wastewater treatment facility. Other solid waste will be collected in enclosed containers and disposed of at a state-approved facility.

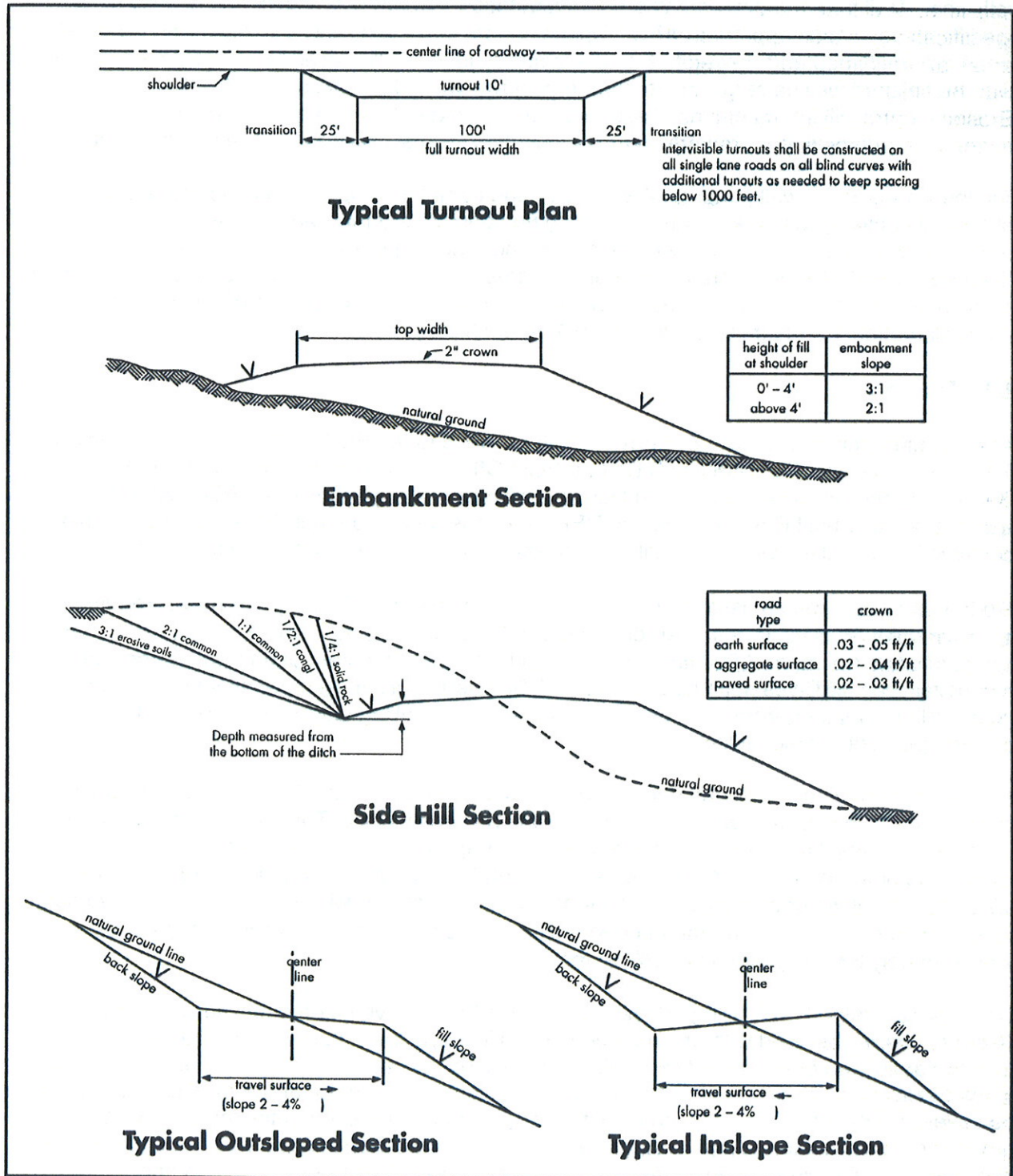
2.2 Access Roads

Approximately 2,710 feet (0.5 miles) of new access roads will be constructed and 4,168 feet (0.8 miles) of existing two-tracks will be upgraded or improved. Signed agreements will be in place allowing road construction across affected surface allotments and private land surfaces, and any applicable approach permits and/or easements will be obtained prior to any construction activity. A maximum disturbed right-of-way (ROW) width of 66 feet for each access road will result in up to 10.4 acres of surface disturbance.

Construction will follow road design standards outlined in the Gold Book. A minimum of six inches of topsoil will be stripped from the access road corridors, with the stockpiled topsoil redistributed on the outslope areas of the borrow ditches following road construction. These borrow ditch areas will be reseeded as soon as practical with a seed mixture determined by the BIA. Care will be taken during road construction to avoid disturbing or disrupting any buried utilities that may be placed along existing roads. If commercial production is established from a proposed location, the access road will be graveled with a minimum of four inches of gravel and the roadway will remain in place for the life of the well(s). Details of road construction are addressed in the Multi-Point Surface Use and Operations Plan in each APD. Typical cross-sections are shown in Figure 2.

Figure 2. Typical roadway cross section (Gold Book)

- Construction Steps**
1. Salvage topsoil
 2. Construct road
 3. Redistribute topsoil
 4. Revegetate slopes



2.3 Well Pads

The proposed well pad(s) will consist mainly of an area leveled for the drilling rig and related equipment, and a pit excavated for drilling fluids, drill cuttings, and fluids produced during drilling activities. Well pad areas will be cleared of vegetation, stripped of topsoil, and graded to the specifications in each approved APD. Topsoil will be stockpiled and stabilized until disturbed areas are reclaimed and re-vegetated. Excavated subsoil will be used in well pad construction, with the finished well pads graded to ensure positive water drainage away from the drill site. Erosion control will be maintained through prompt re-vegetation and by constructing all necessary surface water drainage controls, including berms, diversion ditches, and waterbars.

The level area of the well pads used for drilling and completion operations (including a reserve pit for drill cuttings) will be a maximum of 430 feet long by 330 feet wide (3.3 acres per well pad). Cut and fill slopes and stockpiled topsoil and reserve pit backfill on the edge of pads will disturb another 0.9 acres. An average of 4.2 acres of surface disturbance for each well pad will result in approximately 16.8 total acres for all proposed well pads. Details of pad construction and reclamation are diagrammed in the APD for each site.

2.4 Drilling

After securing mineral leases, Zenergy submitted APDs to the BLM for the proposed wells on February 10, 2009. The BLM North Dakota Field Office forwarded the APDs to the BIA's Fort Berthold Agency in New Town, North Dakota, for review and concurrence. BLM will not approve an APD until BIA completes its NEPA process and recommends APD approval. No construction or drilling will begin until an approved permit has been obtained from the BLM.

Rig transport and on-site assembly will take about seven days. A rotary drill rig will require approximately 35 days to reach target depths. A typical drilling rig is shown in Figure 3. For approximately the upper 2,500 feet of the drilled hole, a fresh-water based mud system with non-hazardous additives such as bentonite will be used to minimize contaminant concerns. Water will be obtained from a commercial source for this drilling stage, using nearly 8.4 gallons of water per foot of hole drilled.

Following the setting and cementing of the near-surface casing, an oil-based mud system will be used to drill to the production casing point for the proposed wells. The oil-based mud system consists of a diesel fuel (80-85%) and water (15-20%) mixture. The oil-based drilling fluids reduce the potential for hole sloughing while drilling through shale formations. Approximately 4,725 gallons of water and 18,900 gallons of diesel fuel per well will be used during the vertical drilling for each well. The lateral reach for each well hole will be drilled using on average approximately 33,600 gallons of fresh water.

Cuttings generated from drilling will be deposited in the reserve pit on each individual well pad. Reserve pits will be lined with an impervious (plastic/vinyl) liner to prevent drilling fluid seepage and contamination of the underlying soil. Liners will be installed over sufficient bedding (either straw or dirt) to cover any rocks, will overlap the pit walls, extend under the mud tanks, and will be covered with dirt and/or rocks to hold it in place. Prior to use, the entire location will be fenced completely with a cattle guard at the access road location, in order to protect both wildlife and livestock. Fencing will be installed in accordance with Gold Book guidelines and maintained until the reserve pits are backfilled.

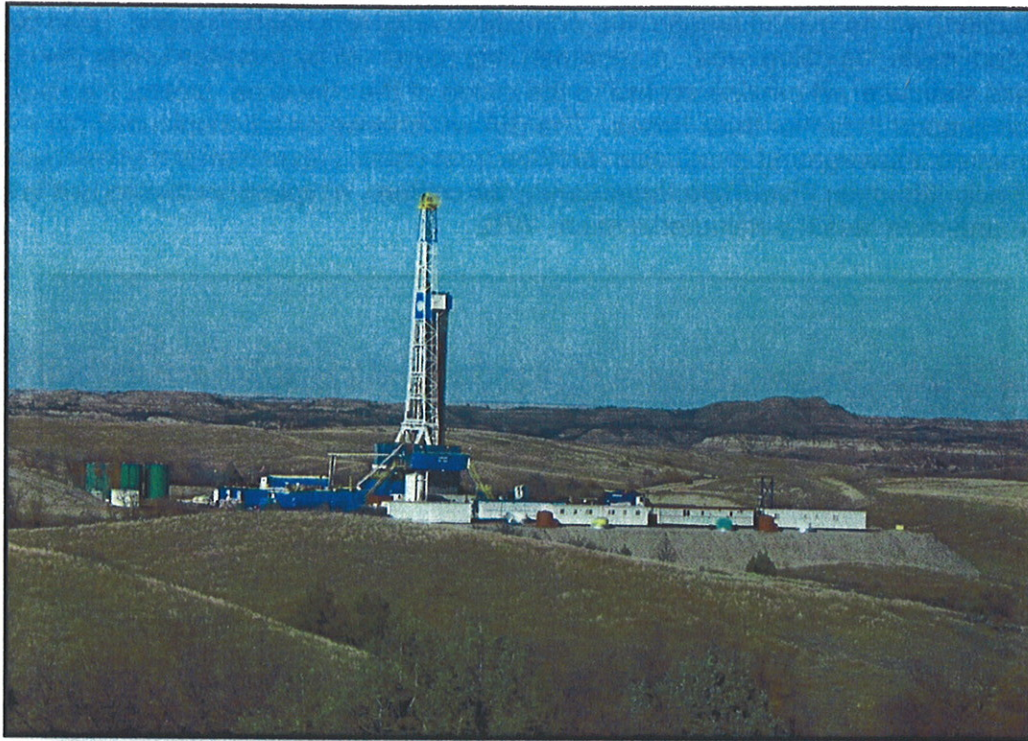


Figure 3. Typical drill rig (McCain and Associates, Inc.)

2.5 Casing and Cementing

Surface casing will be set to approximately 2,500 feet and cemented back to the surface during drilling, isolating all near-surface aquifers in the project area. The Fox Hills Formation will be encountered at approximately 1,700 feet and the Pierre Formation at about 1,800 feet. A production casing cemented from approximately 11,256 feet up to about 4,000 feet will isolate potential hydrocarbon zones in the Dakota Formation that occur below 4,500 feet. The horizontal production section will be uncased. Casing and cementing operations will be conducted in full compliance with *Onshore Oil and Gas Orders 2* (Title 43 CFR 3160).

2.6 Completion and Evaluation

A work-over unit will be moved onto the well site following the completion of the drilling rig. Approximately 30 days are usually needed 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. A mixture of sand and a carrier (water and/or nitrogen) may be pumped into the well bore under extreme pressure to fracture the target formation. The sand particles will stabilize the fractures, increase the capture zone and maximize the field drainage. The fracture fluids will be recovered by flowing the well back to the surface. Pits or tanks will be used to collect fluids for disposal. Disposal will be conducted in accordance to NDIC rules and regulations.

2.7 Commercial Production

If drilling, testing, and production support commercial production from any of the proposed locations, additional equipment will be installed including a pumping unit at the well head, a vertical heater/treater, storage tanks (usually four 400-barrel steel tanks), and a flare/production pit. An impervious dike (that can contain 100% capacity of the largest holding tank and a single

day's production) will be placed around the production tanks and heater/treater. Load out lines will be located inside the diked area. A screened drip barrel will be installed under the outlet. A metal access staircase will provide access to the inside of the dike area, protect the dike, and may provide support to tanker truck hoses. The BIA will choose an inconspicuous paint color for all permanent aboveground production facilities from colors recommended either by the BLM or by the Rocky Mountain Five-State Interagency committee. A typical producing unit is shown in Figure 4 and more detail is included in each APD.

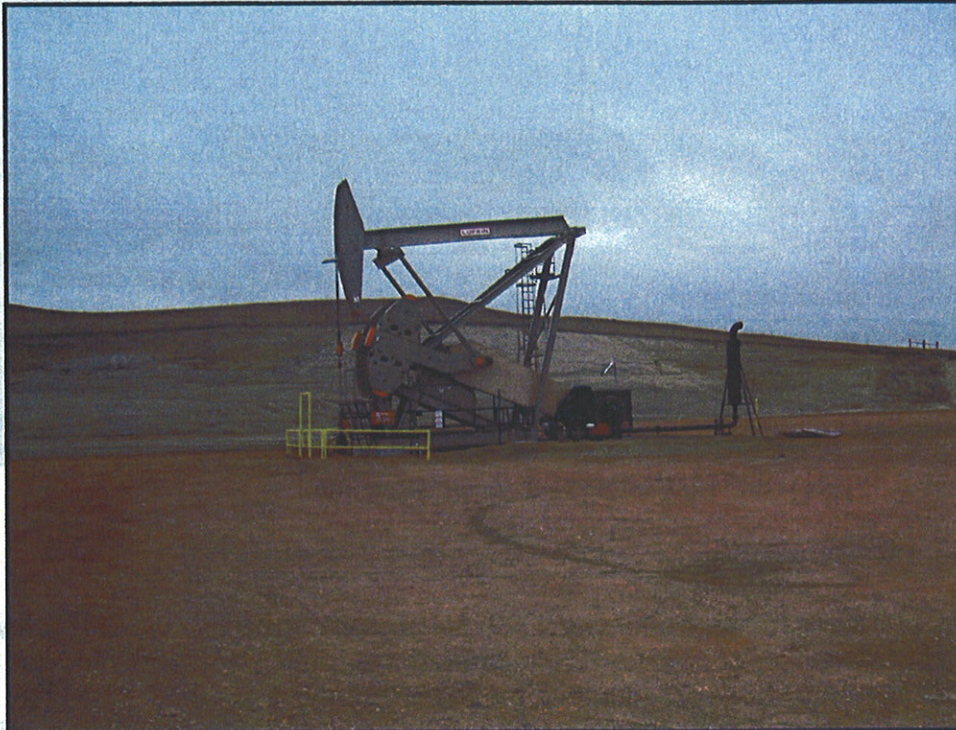


Figure 4. Typical producing unit (McCain and Associates, Inc.)

Oil will be collected in tanks installed on location and periodically trucked to an existing oil terminal for sales. Produced water will be collected and contained in tanks and will be removed for periodic disposal at an approved disposal site. Production volumes of oil and water will dictate trucking frequency.

The duration of production operations cannot be reliably predicted, but some oil wells have pumped for more than 100 years. Initial estimation of daily production will be approximately 500 barrels of oil and 100 barrels of water. The production is anticipated to decrease after three months to approximately 200 barrels of oil and 50 barrels of water per day. The produced water is primarily comprised of fracture fluids and should decrease over time.

Ancillary developments, such as right-of-way for oil and water pipelines and a powerline may be applied for in the future by the well site operator. This EA does not address any impacts that will be caused by these ancillary developments.

Large volumes of natural gas are not expected from these locations. Small volumes will be flared in accordance with Notice to Lessees (NTL) 4A and adopted NDIC regulations, which prohibit unrestricted flaring for more than the initial year of operation (NDCC 28-08-06.4).

Results could also encourage additional exploration. Should future oil/gas exploration activities be proposed wholly or partly on trust land, those proposals and associated federal actions would require additional site-specific NEPA analysis and BIA consideration prior to implementation.

2.8 Construction Details at Individual Sites

2.8.1 D-3 Dancing Bull #4-8H

The D-3 Dancing Bull #4-8H well pad site is located on a small, convex hill in an agricultural field. (Figure 5). The D-3 Dancing Bull #4-8H well pad site is located in the NW¼NW¼ of Section 8, T150N, R92W (Figure 6). The proposed well site will be approximately 300 feet by 400 feet in size or 2.8 acres with an estimated additional construction ground disturbance of 0.9 acres. Two soil stockpiles will be placed on the south side of the pad site.



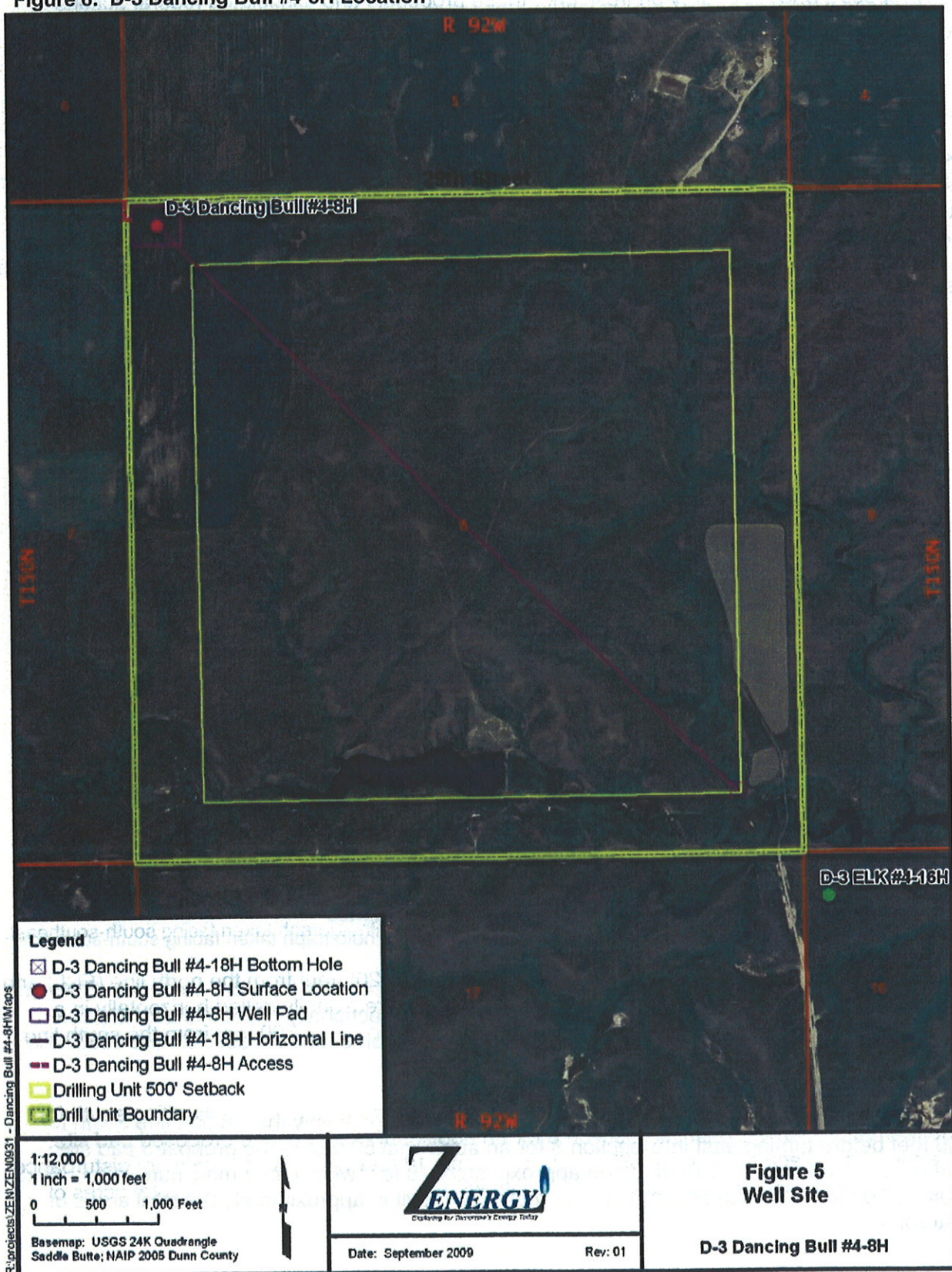
Figure 5. D-3 Dancing Bull #4-8H General Appearance

The proposed site lies on a convex cropland area. Photograph taken facing south-southeast.

The surface location of the borehole will be approximately 205 feet from the north line (FNL) and 250 feet from the west line (FWL). The borehole will be directionally drilled horizontally in a south-easterly direction to the a bottom hole target in Section 8, at 500 feet from the south line (FSL) and 500 feet from the east line (FEL).

The access route will begin along Tribal Road 29th Street and follow the section line south for 156 feet before turning east into Section 8 for an additional 50 feet to the proposed pad site. The running surface of the road will be approximately 18 feet wide with a maximum disturbance width of 50 feet. The pad site and access route will result in approximately 3.9 total acres of disturbance.

Figure 6. D-3 Dancing Bull #4-8H Location



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2.8.2 D-3 Elk #4-16H

The proposed D-3 Elk #4-16H pad is located on a north-facing slope of native grassland (Figure 7) in the NW¼NW¼ of Section 16, T150N, R92W. The site is located just south of Mountrail County 28th Street NW (Figure 8). The proposed pad size will be approximately 330 feet by 430 feet in size or 3.3 acres with an estimated additional construction ground disturbance of 0.9 acres. The two soil stockpiles will be placed on the south and east sides of the pad site.



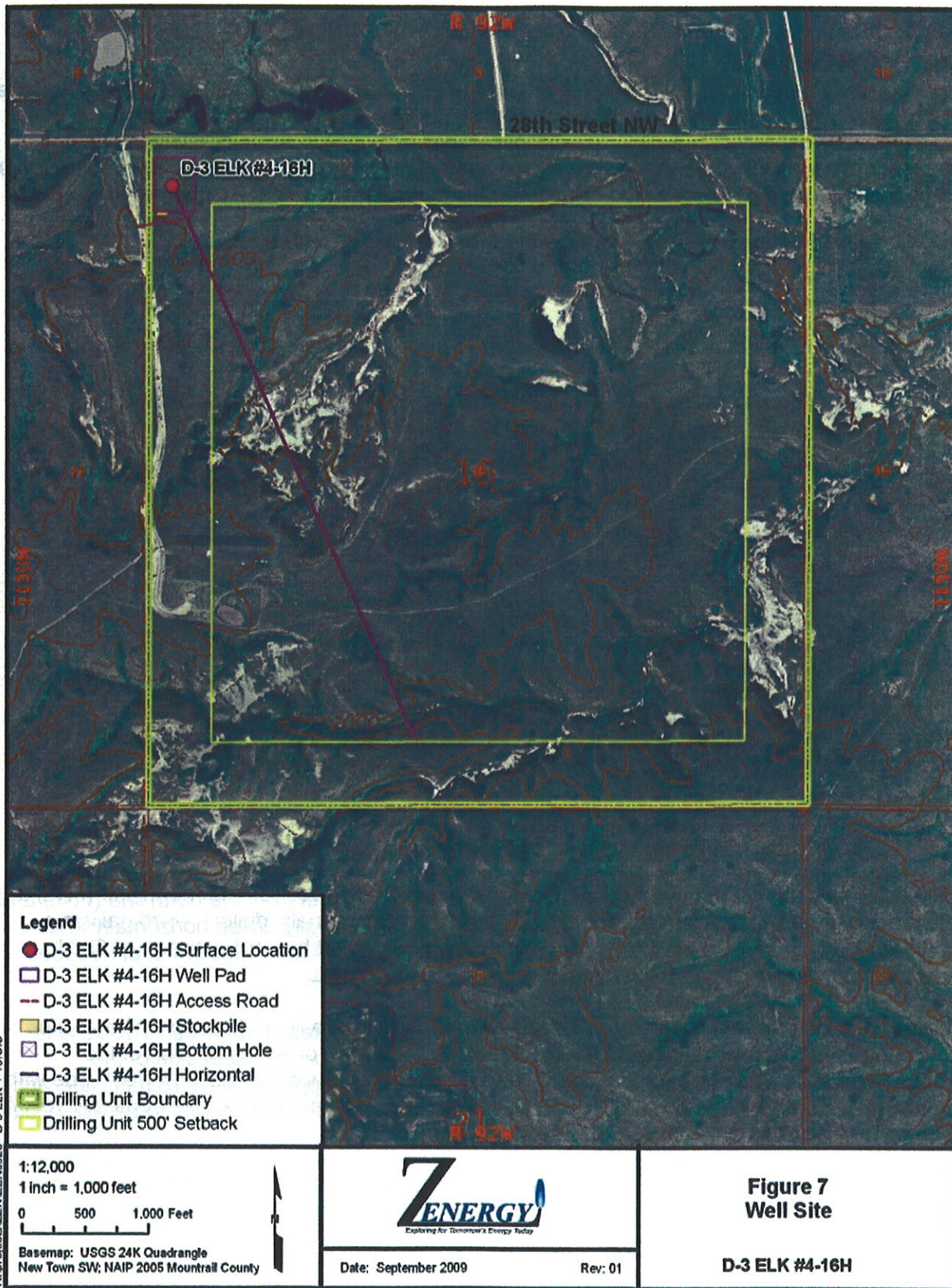
Figure 7. D-3 Elk #4-16H General Appearance

The proposed well site lies on a 5-8 % downslope to the north in native grasslands. Photograph was taken facing east near proposed access road.

The surface location of the borehole will be approximately 355 feet from the north line (FNL) and 189 feet from the west line (FWL). The borehole will be directionally drilled horizontally in a south-easterly direction to the bottom hole target within the west half of Section 6, at 550 feet from the south line (FSL) and 2,090 feet from the west line (FWL).

The pad access road will follow a private driveway for approximately 0.15 miles. The access road departs from the driveway and travels 376 feet to the west on the north side of the proposed pad site. The newly constructed road surface will be approximately 18 feet wide with a maximum disturbance width of 50 feet or 0.4 acres. The pad site and access route will result in approximately 4.6 total acres of new disturbance.

Figure 8. D-3 Elk #4-16H Location



2.8.3 D-3 Shell Creek #4-7H

The D-3 Shell Creek #4-7H well site is located on a gently sloping cultivated field (Figure 9) in the SE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 7, T150N, R91W (Figure 10). The proposed pad size will be approximately 330 feet by 430 feet in size or 3.3 acres with an estimated additional construction ground disturbance of 0.9 acres. Soil stockpiles will be placed on the east and west sides of the pad site.

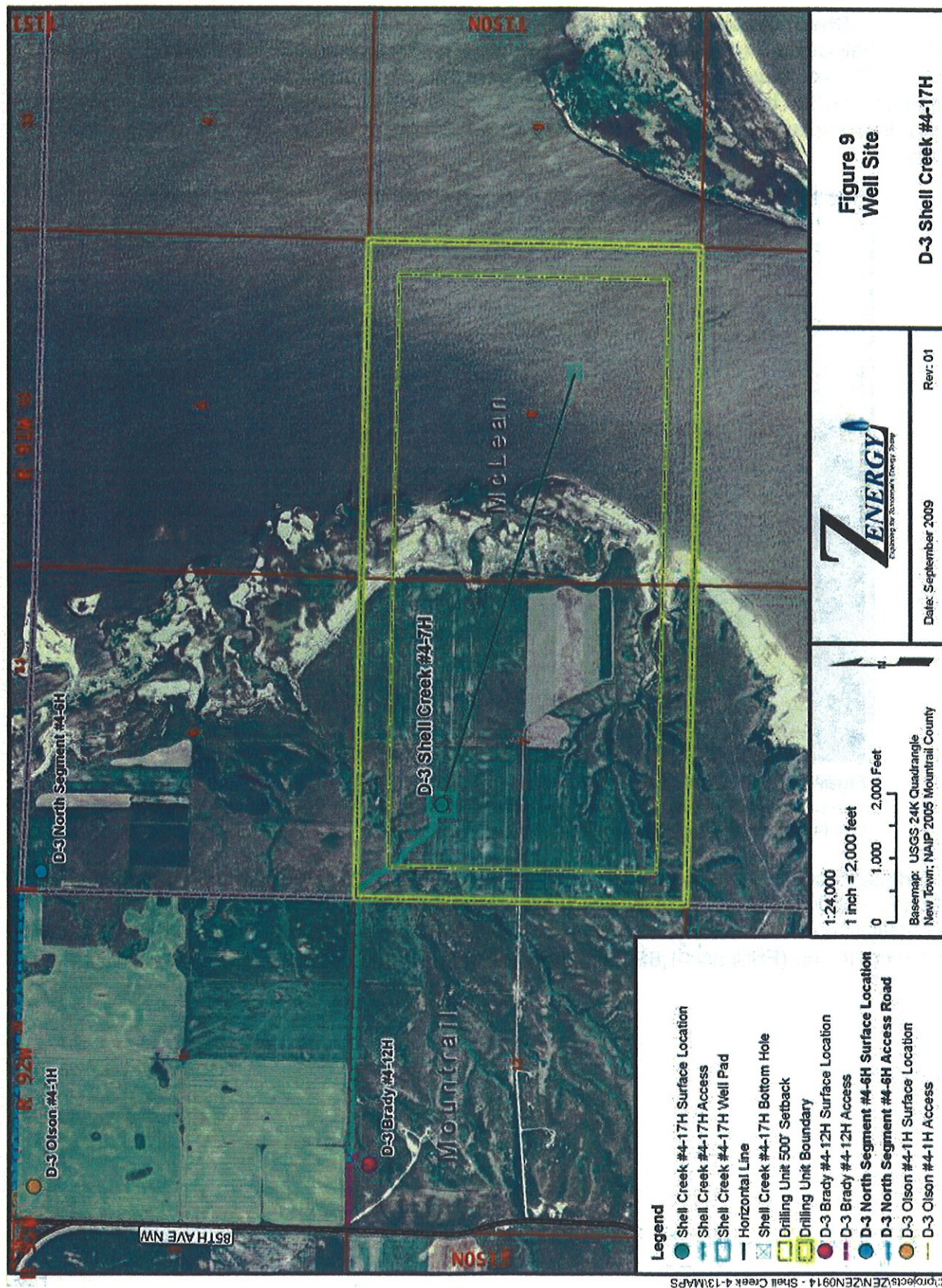


Figure 9. D-3 Shell Creek #4-7H General Appearance

The proposed well site is located on gently sloping cropland. Photo was taken facing south-southeast from the near the fence line.

The surface location of the borehole will be approximately 1,367 feet from the north section line (FNL) and 1,500 feet from the west line (FWL). The borehole will be directionally drilled horizontally in a south-easterly direction to the bottom hole target within Section-8, at 1,880 feet from the south line (FSL) and 1,880 feet from the east line (FEL).

Figure 10. D-3 Shell Creek #4-7H Location



The proposed access route begins in the northwest corner of Section 12, T150N, R92W, extending from the proposed D-3 Brady #4-12H well. The proposed access follows an existing two-track along the section line east to Section 7 (Figure 11). As the access enters into Section 7, it turns to the southeast, crossing an ephemeral drainage on the way to the proposed well site. A culvert large enough to allow passage of storm events will be placed under the roadway. The running surface of the road will be 6,049 feet long with a right-of-way maximum disturbance width of 66 feet or 9.2 acres. The pad site and access route will result in approximately 13.4 acres of disturbance.



Figure 11. D-3 Shell Creek #4-7H Access Road
Photo taken looking east along the proposed access road.

2.8.4 D-3 T. Smith #16-3H

The D-3 T. Smith #16-3H well site is located on annual cropland (Figure 12) in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 3, T150N, R92W (Figure 13). The well site is near the intersection of Mountrail County

Road 30th Avenue Northwest and Tribal Road 29th Street and is located The proposed well site will be approximately 300 feet by 400 feet in size, approximately 2.8 acres, with an estimated additional construction ground disturbance of 0.9 acres. Two soil stockpiles will be placed on the north side of the pad site.



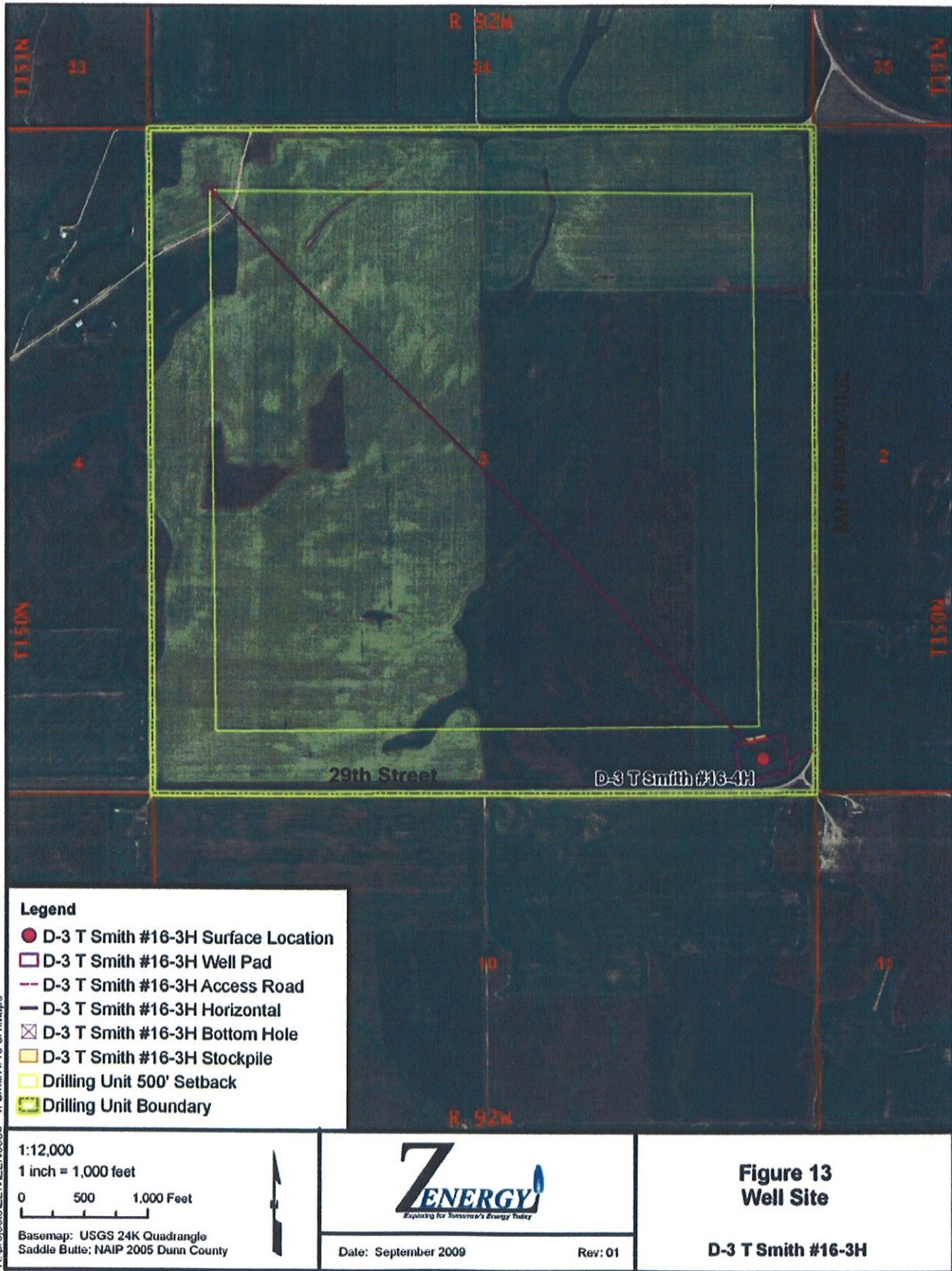
Figure 12. D-3 T. Smith #16-3H General Appearance

The proposed well site lies on a level to gently rolling cropland area. Photograph was taken facing north.

The surface location of the borehole will be approximately 245 feet from the south section line (FSL) and 410 feet from the east section line (FEL). The borehole will be directionally drilled horizontally in a north-westerly direction to the bottom hole target in Section 3, at 500 feet from the north section line (FNL) and 500 feet from the west section line (FWL).

An access route, approximately 248 feet in length, will begin along Mountrail CR 30th Avenue NW and proceed in a west and southwest direction to the proposed well site. The running surface of the road will be approximately 18 feet wide with a maximum disturbance width of 66 feet. The pad site and access route will result in approximately 4.1 acres of total disturbance.

Figure 13. D-3 T. Smith #16-3H Location



2.9 Reclamation

The reserve pit and drill cuttings will be treated, solidified, backfilled, and buried as soon as possible after well completion. Any oily residue is dispersed and captured, preventing coalescence and release to the environment at significant rates in the future. Controlled mixing of cuttings with non-toxic reagents causes an irreversible reaction that quickly results in an inert, solid material. The alkaline nature of the stabilized material also chemically stabilizes various metals that may be present, primarily by transforming them into less soluble compounds. Treated material will then be buried in the reserve pit, overlain by at least four feet of overburden as required by adopted NDIC regulations.

If commercial production equipment is installed, the well pad will be reduced in size to, <1 acre, reclaiming the rest of the original pad. The working area of each well pad and the running surface of access roads will be surfaced with scoria or crushed rock obtained from a previously approved location. The outslope portions of roads will be covered with stockpiled topsoil and re-seeded with a seed mixture determined by the BIA, reducing the residual access-related disturbance to about 28' wide. Other interim reclamation measures to be accomplished within the first year include reduction of the cut and fill slopes, redistribution of stockpiled topsoil, installation of erosion control measures, and reseeded as recommended by the BIA.

Final reclamation will occur either in the very short term if the proposed well is commercially unproductive, or later upon final abandonment of commercial operations. All disturbed areas will be reclaimed, reflecting the BIA view of oil and gas exploration and production as temporary intrusions on the landscape. All facilities will be removed, well bores will be plugged with cement and dry hole markers will be set. Access roads and work areas will be leveled or backfilled as necessary, scarified, re-contoured and re-seeded. 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. Please refer to the Surface Use Plan within each attached APD in Section 7 for further detail regarding both interim and final reclamation measures. Figure 14 and Figure 15 show a typical reclamation from the Gold Book.

2.10 Preferred Alternative

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

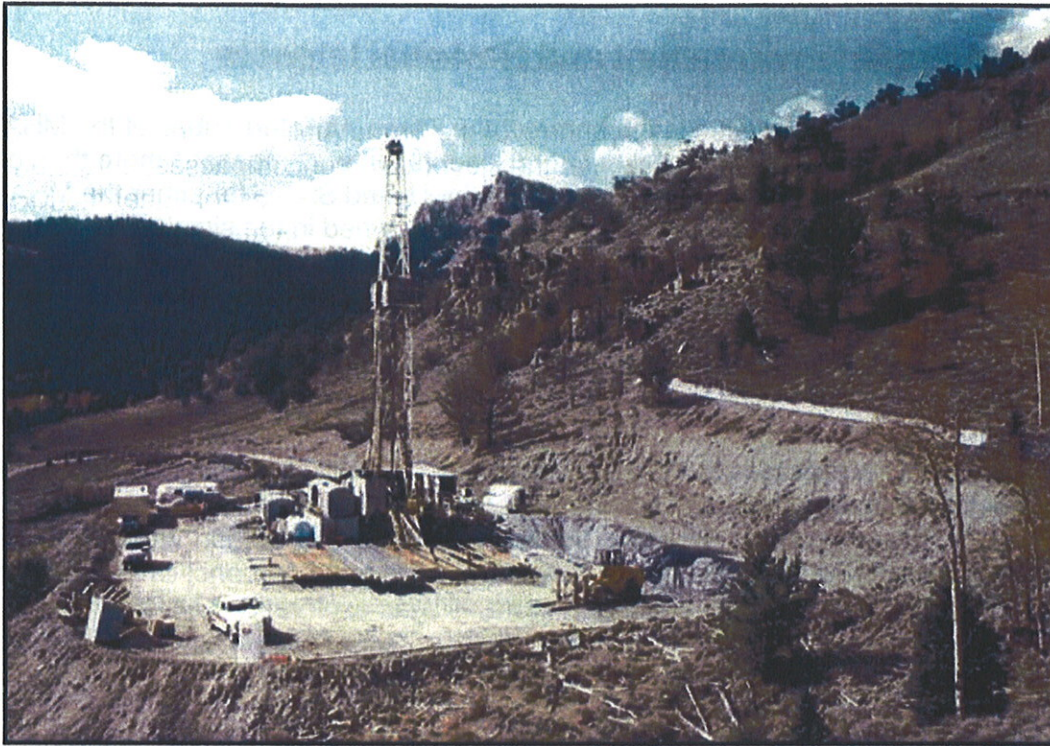


Figure 14. Typical well pad during operation.

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



Figure 15. Well pad after reclamation.

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

3.0 The Affected Environment and Potential Impacts

The Fort Berthold Indian Reservation is the home of the Three Affiliated Tribes 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 by Lake Sakakawea, an impoundment of the Missouri River upstream of the dam.

The proposed well(s) and access road(s) are situated geologically within the Williston Basin, where the shallow structure consists of sandstones, silts and shales dating to the Tertiary Period (65 to 2 million years ago), including the Sentinel Butte and Golden Valley Formations. The underlying Bakken Formation is a well-known source of hydrocarbons; its middle member is targeted by the proposed project(s). Although earlier oil/gas exploration activities within the Reservation were limited and commercially unproductive, recent economic and technological advancement have created feasible access to the Bakken Formation.

The Reservation is within the northern Great Plains ecoregion, which consists of four physiographic units:

- Missouri Coteau Slope north of Lake Sakakawea;
- Missouri River Trench (that part not flooded);
- Little Missouri River Badlands; and
- Missouri Plateau south and west of Lake Sakakawea

Much of the Reservation is located on the Missouri Coteau Slope and is comprised of a formerly glaciated gently rolling landscape. Elevations on the Reservation range from 1,838 feet at Lake Sakakawea to over 2,600 feet on Phaelan's Butte near Mandaree. Annual precipitation on the plateau averages between 15 to 17 inches. Mean temperatures fluctuate between -3° and 21°F in January and between 55° to 83° in July, with 95 to 130 frost-free days each year (Bryce *et al.* 1998; High Plains Regional Climate Center 2008).

The proposed well site(s) and spacing units are in a rural area consisting primarily of grassland, shrubland, and cropland that is currently farmed, idle or used to graze livestock. The landscape has been previously disturbed by dirt trails and graveled and paved roadways.

The broad definition of 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 and the Preferred Alternative. 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. After consideration of the no-action alternative, existing conditions and potential impacts from the proposed projects are described below.

3.1 The No Action Alternative

Under the No Action Alternative, the proposed projects would not be constructed, drilled, installed, or operated. Existing conditions would not be impacted for 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, trucking, and other traffic would not change from present levels. Under the No Action Alternative, the MHA Nation, tribal members, and allottees would not have the opportunity to realize potential financial gains resulting from the discovery of resources at these well locations.

3.2 Air Quality

The North Dakota Department of Health (NDDH) network of Ambient Air Quality Monitoring (AAQM) stations includes 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. Criteria pollutants tracked under National Ambient Air Quality Standards (NAAQS) of the *Clean Air Act* include sulfur dioxide (SO₂), particulate matter (PM₁₀), nitrogen dioxide (NO₂), and ozone (O₃). Two other criteria pollutants – lead (Pb) and carbon monoxide (CO) – are not monitored by any of the three stations. Table 1 summarizes federal air quality standards and available air quality data from the three-country study area.

Table 1. Summary of federal air quality standards and available air quality data from Dunn, McKenzie, and Mercer Counties, ND.

Pollutant	Averaging Period	NAAQS ($\mu\text{g}/\text{m}^3$)	NAAQS (ppm)	County		
				Dunn	McKenzie	Mercer
SO ₂	24-Hour	365	0.14	0.004 ppm	0.004 ppm	0.011 ppm
	Annual Mean	80	0.3	0.001 ppm	0.001 ppm	0.002 ppm
PM ₁₀	24-Hour	150	--	50 ($\mu\text{g}/\text{m}^3$)	35 ($\mu\text{g}/\text{m}^3$)	35 ($\mu\text{g}/\text{m}^3$)
	Annual Mean	50	--	--	--	--
PM _{2.5}	24-Hour	35	--	--	--	--
	Weighted Annual Mean	15	--	--	--	--
NO ₂	Annual Mean	100	0.053	0.002 ppm	0.001 ppm	0.003 ppm
CO	1-Hour	40,000	35	--	--	--
	8-Hour	10,000	9	--	--	--
Pb	3-Month	1.5	--	--	--	--
O ₃	1-Hour	240	0.12	0.071 ppm	0.072 ppm	0.076 ppm
	8-Hour	--	0.08	0.061 ppm	0.066 ppm	0.067 ppm

North Dakota was one of nine states in 2006 that met standards for all criteria pollutants. The state also met standards for fine particulates and the eight-hour ozone standards established by the U.S. Environmental Protection Agency (EPA) (NDDH 2007). The three counties addressed in Table 2 are also in full attainment and usually far below established limits for these pollutants (American Lung Association 2006). The Clean Air Act mandates prevention of significant deterioration in designated attainment areas. Class I areas are of national significance and include national parks greater than 6,000 acres in size, national monuments, national seashores, and federal wilderness areas larger than 5,000 acres and designated prior to 1977. There is a Class I airshed at nearby Theodore Roosevelt National Park (TRNP), which covers approximately 110 square miles in three units within the Little Missouri National Grassland between Medora and Watford City, located 30-40 miles west of the proposed projects. The reservation can be considered a Class II attainment airshed, which affords it a lower level of protection from significant deterioration.

The proposed projects are similar to other nearby approved previously installed projects. Construction, drilling, and tanker traffic will generate temporary, intermittent, and nearly undetectable gaseous emissions of particulates, SO₂, NO₂, CO₂, and volatile organic compounds. Road dust will be controlled as necessary and other best management practices implemented as necessary to limit emissions to the immediate project areas (BLM 2005). No detectable or long-term impacts to air quality or visibility are expected within the airsheds of the Reservation, state, or TRNP. No laws, regulations or other requirements have been waived; no monitoring or compensatory measures are required.

3.3 Public Health and Safety

Health and safety concerns include naturally occurring toxic gases, hazardous materials used or generated during installation or production, and hazards posed by heavy truck traffic associated with drilling, completion, and production activities.

Hydrogen sulfide gas (H₂S) is extremely toxic in concentrations above 500 parts per million (ppm), but it has not been found in measurable quantities in the Bakken Formation. Before

reaching the Bakken, however, drilling will penetrate the Mission Canyon Formation, which is known to contain varying concentrations of H₂S. Release of H₂S at dangerous concentrations is very unlikely. Contingency plans submitted to BLM comply fully with relevant portions of *Onshore Oil and Gas Order 6* to minimize the potential for gas leaks during drilling. Emergency response plans protect both the drilling crew and the general public within one mile of a well; precautions include automated sampling and alarm systems operating continuously at multiple locations on the well pad.

Satellite imagery was used to identify nearby homes within one and five miles of the proposed well site(s) (Table 2).

Table 2. Distance and location of residences from the proposed well site(s).

Well Name	Nearest residence	# Residences w/in 1 mile	# Residences w/in 5 miles
D-3 Dancing Bull #4-8H	5,000' Northeast	1	40
D-3 Elk #4-16H	2,880' West	6	33
D-3 Shell Creek #4-7H	4,500' Southwest	3	28
D-3 T Smith #16-4H	825' Southeast	4	35

In addition to the permanent residences, a recreation area (Pouch Point) has approximately 71 seasonal residences and is located in Sections 14 and 23 of T150N, R92W. These are not included in the table above. The closest proposed well to Pouch Point is the D-3 T Smith #16-4H, located approximately two miles to the northwest of the recreation area.

Negative impacts from construction will be largely temporary. Noise, fugitive dust, and traffic hazards will be prevalent during the construction, drilling, and well completion (approximately 60 days) and then diminish quickly during commercial operation. Approximately 50 trips during several days will be needed to transport the drilling rig and associated equipment to each site. The same amount of traffic will be required to dismantle and transport the drilling rig following the completion of the drilling operations.

One small pick-up will travel to each well pad daily if the wells prove productive. Natural gas will initially be flared during production and the produced oil and water will be trucked away from the well site. Tanker truck activity depends directly on production of the well. Initially a successful Bakken well usually produces high rates of both oil and water. Upwards of 500 barrels of oil and 100 barrels of water per day might be expected during the initial months of production. Daily production typically decreases by 50% or more after the initial months. An oil tanker usually hauls 140 barrels and a water tanker holds 110 barrels per load. Four oil tankers and one water tanker may visit each well site per day during the initial months of production. This number will decline dramatically as production declines. Established load restrictions for state and BIA roadways will be followed and appropriate haul permits will be acquired. All traffic must be confined to approved routes and conform to load and speed limits.

The EPA specifies chemical reporting under Title III of the *Superfund Amendments and Reauthorization Act* (SARA) of 1986, as amended. No materials used or generated by these projects for production, use, storage, transport, or disposal are on either the SARA list or on EPA's list of extremely hazardous substances in 40 CFR 355. Project design and operational precautions mitigate against impacts from toxic gases, hazardous materials, and traffic. All operations, including flaring, will conform to instructions from BIA fire management staff. Impacts from the proposed projects are considered minimal, unlikely or insignificant. No laws

regulations, or requirements have been waived; no compensatory mitigation measures are required.

3.4 Water Resources

3.4.1 Surface Water

The proposed sites are located on a formerly glaciated upland in the Missouri River Regional Water Basin (Figure 16). Surface water runoff generally starts as sheet-flow until collected by ephemeral drainages leading to Lake Sakakawea. The ephemeral drainages, in turn, combine to form intermittent and/or perennial streams that flow into Lake Sakakawea. Lake Sakakawea is part of the Missouri River sub-regional watershed and is the receiving water for runoff from the land area surrounding the well sites.

3.4.1.1 D-3 Dancing Bull #4-8H

The Dancing Bull #4-8H well site is situated on a small, convex hill above Little Shell Creek. The well site is located within the Garrison Dam Sub-Basin, the Independence Point Watershed and Little Shell Creek Sub-Watershed. Topography and Tribal Road 29th Street prevent surface water flow to the north. Surface water runoff flows generally to the south/southeast. There is an ephemeral drainage approximately 1,200 feet southeast of the well site that drains directly to Little Shell Creek. Little Shell Creek, in turn, flows southeasterly to Lake Sakakawea.

Table 3. Distance from D-3 Dancing Bull #4-8H to Receiving Water

Source - Point	Distance	
	feet	miles
Ephemeral drain to Little Shell Creek	1,200	0.2
Little Shell Creek to Lake Sakakawea ¹	24,000	4.5
TOTAL DISTANCE	25,200	4.7

¹Lake level based on Mountrail County Aerial Photograph (NAIP 2006)

3.4.1.2 D-3 Elk #4-16H

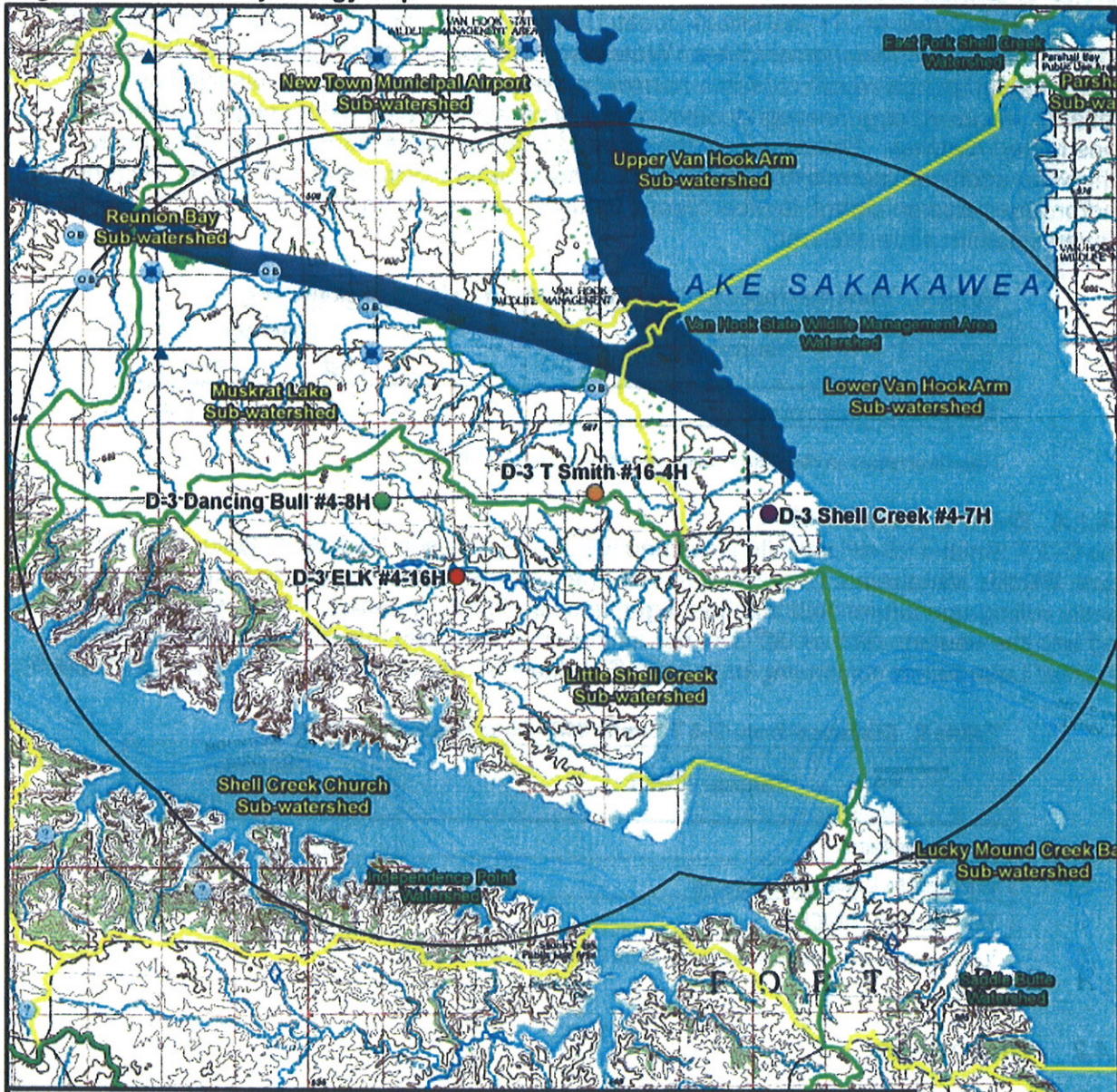
The D-3 Elk #4-16H well site is located within the Garrison Dam Sub-Basin, the Independence Point Watershed and Little Shell Creek Sub-Watershed. Surface water runoff at the D-3 Elk #4-16H well site will flow directly to the north. The 28th Street Northwest road ditch will serve as a surface water collector from the well site. Flow in the road ditch heads 1,400 feet east where it intercepts Little Shell Creek crossing under 28th Street. Little Shell Creek meanders approximately three miles to the south and east before reaching the shores of Lake Sakakawea.

Table 4. Distance from D-3 Elk #4-16H to Receiving Water

Source - Point	Distance	
	feet	miles
Ditch drain to Little Shell Creek	1,400	0.3
Little Shell Creek to Lake Sakakawea ¹	16,000	3.0
TOTAL DISTANCE	17,000	3.3

¹Lake level based on Mountrail County Aerial Photograph (NAIP 2006)

Figure 16. General Hydrology Map



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Legend			
5 mile Radius	Water Wells	Aquifers	Stream Type
D-3 Dancing Bull #4-8H Surface Location	Domestic and Stock Well	Yield between 50 and 500	Intermittent
D-3 T Smith #16-3H Surface Location	Observation Well	Yield more than 500	Perennial
D-3 ELK #4-16H Surface Location	Surface Water Sample Site	NWI Designated	
D-3 Shell Creek #4-7H	Test Hole	Freshwater Emergent Wetland	
Watershed Boundary	Unknown	Freshwater Forested/Shrub Wetland	
Sub-watershed Boundary		Freshwater Pond	
		Lake	

1:126,720
1 inch = 2 miles
0 1 2 Miles

Basemap: USGS Parshall 100K Quadrangle

Date: September 2009 Rev: 01

Figure 16
General Hydrology Map

Zenergy Operating Company, LLC

3.4.1.3 D-3 Shell Creek #4-7H

The D-3 Shell Creek #4-7H well site is located within the Garrison Dam Sub-Basin, the Van Hook State Wildlife Management Area Watershed and Lower Van Hook Arm Sub-Watershed. The proposed access route crosses a narrow ephemeral drainage that is classified as a wetland. A culvert large enough to allow passage of storm events will be placed under the constructed roadway. Disturbance of the wetland shall be kept to under 1/10th of an acre, otherwise additional permitting from the U.S. Army Corps of Engineers is needed. Silt fences and/or other erosion control devices should be used during construction to control erosion and prevent siltation of the wetland.

Table 5. Distance from D-3 Shell Creek #4-7H to Lake Sakakawea

Source - Point	Distance	
	feet	miles
Site to Lake Sakakawea ¹	2,500	0.5

¹Lake level based on Mountrail County Aerial Photograph (NAIP 2006)

3.4.1.4 D-3 T Smith #16-4H

The D-3 T Smith #16-4H well site is located within the Garrison Dam Sub-Basin, the Van Hook State Wildlife Management Area Watershed and Muskrat Lake Sub-Watershed. It is a level to gentle rolling agricultural field that has a gentle slope to the northeast. Water will drain off the pad into the western ditch of 30th Avenue and drain to the north into a wetland located below Muskrat Lake before continuing on to Lake Sakakawea, approximately 3.2 total miles (Table 6).

Table 6. Distance from D-3 T Smith #16-4H to Receiving Water

Source - Point	Distance	
	feet	miles
Site to wetland	7,100	1.3
Wetland to Lake Sakakawea ¹	10,100	1.9
TOTAL DISTANCE	17,200	3.2

¹Lake level based on Mountrail County Aerial Photograph (NAIP 2006)

3.4.2 Groundwater

3.4.2.1 Mountrail County

The principal uses of ground water in Mountrail County are for domestic and livestock supplies, public supplies, industrial supplies, and irrigation. Most farm units in the area have at least one well for their domestic and livestock uses, but no records are available to accurately determine the quantity of water used. Practically all of the water used for industrial purposes in Mountrail County either is used in connection with the production of petroleum or is obtained from public supplies and no records are kept. The largest use of ground water in the county is for pressure maintenance during well drilling.

Ground water in Mountrail County is obtained from aquifers in the glacial drift of Quaternary age, the Sentinel Butte and Tongue River Formations in the Fort Union Group of Tertiary age, and the Fox Hills Formation, Hell Creek Formation, and the Dakota Group of Cretaceous age. The Dakota Group, Fox Hills Formation, Hell Creek Formation, Fort Union Group, and the glacial drift contain the only aquifers that are presently of economic importance.

The upper part of the Fox Hills Formation and the lower part of the Hell Creek Formation contain about 100 feet of sandstone in an inter-bedded sandstone, siltstone, and shale zone. The sandstone beds in the zone apparently are connected hydrologically and herein are referred to as the Fox Hills-Hell Creek aquifer.

The top of the Fox Hills-Hell Creek aquifer generally ranges from 1,550 to 2,100 feet below land surface (altitude about 300 feet above msl) in the south-central and southwestern parts of Mountrail County. The top of the aquifer is about 1,450 to 2,100 feet below land surface (altitude about 550 feet above msl) in the southeastern part of the county.

The Fort Union Group generally underlies the glacial drift at depths of less than 100 feet throughout much of the Coteau Slope and the Drift Prairie, except in the larger ancient buried valleys. Depths to the Fort Union are commonly more than 100 feet in the Coteau du Missouri area, but many exceptions do exist. The group is subdivided into four formations in some Tongue River and Sentinel Butte Formation sections.

The Tongue River and Sentinel Butte Formations either crop out or immediately underlie the glacial drift in the report area. These units are distinguishable only on the surface in Mountrail County. Individual sand beds in the Tongue River-Sentinel Butte Formations vary greatly in thickness. Most sand beds are less than 10 feet thick, but thicknesses exceeding 100 feet, do occur.

3.4.2.2 McLean County

The preglacial rocks in McLean County contain thick sequences of water-bearing rocks, but only those at relatively shallow depths are of economic importance as aquifers. These aquifers occur in the Fox Hills and Hell Creek Formations of Cretaceous age and the Fort Union Group of Paleocene age.

The Fox Hills Formation underlies the entire county. It consists of inter-bedded sandstone, shale, and siltstone and ranges in thickness from 233 to about 450 feet. The depth to the top of the formation ranges from about 540 feet in the eastern part of the county to about 1,200 feet in the western part.

The Hell Creek Formation, which conformably overlies the Fox Hills Formation, consists of inter-bedded silty shale and sandstone. In the eastern part of the county, the Hell Creek Formation was reached at a depth of 317 feet where it has a total thickness of 223 feet. The depth and thickness of the formation in the western part of the county is unknown.

3.4.3 Water Wells and Water Use Permits

There is one domestic and stock water supply well within five miles of the proposed well sites. There have been eight water test wells drilled within five miles of the proposed locations. These include four test holes and four observation wells installed (Table 7).

One active water permit is located within five miles of the project area. It is located in the SW $\frac{1}{4}$ Section 34, T151N, R92W. The permit was issued on October 27, 1970, to J. & S. Pennington. This is a perfected permit for flood irrigation from surface water. It is located 1.8 miles from the project area.

Table 7. Water wells within 5 miles of proposed well sites.

LOCATION	Distance To Nearest Proposed Well (miles)	Permit Type	Aquifer	Well Depth (feet)	Date
NW NW 35 T151N R93W	3.6	Domestic and Stock Well	Tongue River	298	1/3/1988
SE SE 34 T151N R92W	1.3	Observation Well	White Shield	138	8/6/1966
NE NE 30 T151N R92W	2.5	Observation Well	Undefined	210	6/4/1992
SE SE 24 T151N R93W	3.4	Observation Well	Unknown	145	6/3/1992
NW NW 27 T151N R93W	4.8	Observation Well	Undefined	240	6/4/1992

¹ ND State Water Commission 2009

Water quality will be protected by drilling with fresh water to a point below the base of the Fox Hills Formation, implementing proper hazardous materials management, and using appropriate casing and cementing. Drilling will proceed in compliance with *Onshore Oil and Gas Order 2, Drilling Operations* (43 CFR 3160). If cement circulation is lost, a cement bound log will be required by BLM to ascertain if remedial cementing is required to provide an adequate seal between casing and strata. Surface casing will be cemented in place to a depth of about 2,500 feet, isolating aquifers in the Fox Hills Formation and extending a minimum of 50 feet into the underlying Pierre shale. Intermediate casing will extend from the surface and be cemented as needed to isolate potentially productive water and hydrocarbon-bearing zones.

Seepage and infiltration of hazardous materials from the reserve pits are considered unlikely due to mandatory construction and linear specifications, including a minimum of two feet of freeboard at all times. There will be no other pits or lagoons. Impacts to shallow aquifers from surface activities and spills will be avoided or managed by implementation of a Spill Prevention, Control, and Countermeasure (SPCC) Plan.

Produced water will be captured in tanks on-site and periodically trucked to an approved disposal site. BIA and BLM will monitor all operations and review site records at their discretion. Evidence of groundwater contamination related to the project will result in a stop work order until all appropriate measures are identified and implemented. These and other construction and reclamation techniques included in the APDs will minimize potential for impacts to both surface water and groundwater. No significant impacts to surface water or groundwater are expected because of the proposed actions. No applicable laws or regulations will be waived; no compensatory mitigation measures are required to protect surface water or groundwater.

3.5 Wetlands, Habitat, and Wildlife

3.5.1 Wetlands

National Wetland Inventory (NWI) maps maintained by the United States Fish and Wildlife Service (USFWS) identify jurisdictional wetlands. No wetlands have been recorded previously near the proposed projects. On-site assessments conducted with representatives from BIA and BLM confirmed that riparian or wetland habitats are not located on the proposed site locations with the exception of the proposed access road for the D-3 Shell Creek #4-7H site as described in Section 3.4.1.3 above.

3.5.2 Species of Concern

Assessments for Federally listed threatened and endangered species were conducted by evaluating historic and present occurrences, and by determining if potential habitat exists within the project areas. Determinations were made concerning direct and cumulative effects of the proposed activities on each species and their habitat. Currently, six species and one Designated Critical Habitat are listed in both McLean and Mountrail Counties, North Dakota (Table 8).

Table 8. County status of Endangered, Threatened, and Candidate species and Designated Critical Habitat

Species	Status	County	
		McLean	Mountrail
Interior Least Tern	Endangered	X	X
Whooping Crane	Endangered	X	X
Black-footed Ferret	Endangered		
Pallid Sturgeon	Endangered	X	X
Gray Wolf	Endangered	X	X
Piping Plover	Threatened	X	X
W Prairie Fringed Orchid	Threatened		
Dakota Skipper	Candidate	X	X
Designated Critical Habitat - Piping Plover		X	X

¹ USFWS (updated May 15, 2009)

3.5.3 Species Assessments

Assessments for Federally listed threatened, endangered species were conducted by evaluating historic and present occurrences and by determining if potential habitat exists within the project area. A determination was made concerning direct and cumulative effects of the proposed activities on each species. Determinations made for federally listed species are:

- No effect
- Is not likely to adversely affect
- Is likely to adversely affect
- Is likely to jeopardize a proposed species or adversely modify critical habitat
- Is not likely to jeopardize a proposed species or adversely modify critical habitat

3.5.3.1 Gray Wolf

Gray wolves, an Endangered Species in North Dakota, historically were found throughout much of North America including the Upper Great Plains. Human activities have restricted their present range to the northern forests of Minnesota, Wisconsin, and Michigan and the Northern Rocky Mountains of Idaho, Montana, and Wyoming. They now only occur as occasional visitors in North Dakota. The most suitable habitat for the gray wolf in North Dakota is found around the Turtle Mountains region where documented and unconfirmed reports of gray wolves have occurred (Grondahl and Martin, no date). The proposed projects will have **no effect** on this species at this time.

3.5.3.2 Interior Least Tern

The interior least tern nests on midstream sandbars along the Yellowstone and Missouri River systems. Interior least terns construct bowl-shaped depression nests on sparsely vegetated sandbars and sandy beaches. Their nesting period occurs between mid-May through mid-August. The proposed projects will not disrupt the Missouri River habitat. The proposed

locations are set back (more than ½ mile) from the Missouri River system and will have **no effect** on this species at this time.

3.5.3.3 Pallid Sturgeon

Pallid sturgeons are found within the Mississippi, Missouri, and Yellowstone River systems. Pallid sturgeon populations in North Dakota have decreased since the 1960's (Grondahl and Martin no date). The proposed projects will not disrupt the Missouri River habitat. The proposed projects will have **no effect** on this species at this time.

3.5.3.4 Whooping Crane

The primary nesting area for the whooping crane is in Canada's Wood Buffalo National Park. Arkansas National Wildlife Refuge in Texas is the primary wintering area for whooping cranes. In the spring and fall, the cranes migrate primarily along the Central Flyway. During the migration, cranes make numerous stops, roosting in large shallow marshes, and feeding and loafing in harvested grain fields. The primary threats to whooping cranes are power lines, illegal hunting, and habitat loss (Texas Park and Wildlife 2008).

The proposed well sites are located within the Central Flyway. Approximately 75% of the whooping crane sightings in North Dakota occur within a 90-mile corridor that includes the proposed well locations. Because collisions with power lines are the primary cause for fledgling mortality, any proposed power lines should be buried. If underground lines are not an option, power lines should be well-marked following specifications made by federal agencies. Following these guidelines, it is reasonable to expect that the proposed activities are not likely to adversely affect whooping cranes.

The proposed well sites have been placed in locations that will have the least impact on whooping cranes; that is near roads, power lines, and building sites. Activities may cause any migratory cranes to divert from the area but is not likely to result in any fatalities. Any sightings should be immediately reported to the USFWS, NDGFD, and/or the BIA.

3.5.3.5 Piping Plover

Piping plovers are found along the Missouri and Yellowstone River systems and on large alkaline wetlands. Nesting sites have been documented on the shorelines of Lake Sakakawea. In addition, critical habitat has been designated along Lake Sakakawea. The proposed well locations are not within line-of-sight of Missouri River habitat.

The project will not disrupt the Missouri River habitat or any designated Critical Habitat. The proposed projects will have **no effect** on this species at this time and **no effect** on critical habitat.

3.5.3.6 Dakota Skipper

Dakota skippers are currently listed as a candidate species in North Dakota and have been documented in Mountrail County. Larvae of the Dakota skipper feed on grasses, favoring little bluestem. Adults emerge in mid-June, feeding on the nectar of flowering native forbs. Harebell (*Campanula rotundifolia*), wood lily (*Lilium philadelphicum*), and purple coneflower (*Echinacea angustifolia*) are common components of their diet (Canadian Wildlife Service, 2004). Dakota skippers are most likely to be found along river valleys or in mesic segments of mixed grass prairie.

D-3 Dancing Bull #4-8H, D-3 Shell Creek #4-7H, and D-3 T Smith #16-4H well sites are located on annual cropland areas and do not provide suitable habitat for the Dakota Skipper. These proposed projects will have **no effect** on this species at this time.

The D-3 Elk #4-16H has potential habitat and but at the time of site visit lacked good residual cover. The proposed project **may impact** individuals but is not likely to adversely affect the population or species.

3.5.4 Wildlife (General)

Table 9 identifies other wildlife that generally may be expected around the proposed sites. Some of these were confirmed by direct observation or by various signs. Direct wildlife observations can be affected by time of day, time of year, etc.

Table 9. Wildlife (General)

Location	Observed	Suitable Habitat
D-3 Dancing Bull #4-8H	none	none
D-3 Elk #4-16H	Western meadowlark	Pronghorn antelope, small mammals, sharp-tailed grouse, and a variety of grassland and nesting song birds
D-3 Shell Creek #4-7H	none	none
D-3 T Smith #16-4H	none	none

Potential impacts to wildlife include construction of well pads, upgrading of existing two-track trails, construction of new roads, and potential future commercial operations. Minimal to no impacts on listed species are expected due to the sparseness of even anecdotal evidence that they may occur within the project areas. On-site assessments confirmed that no threatened or endangered species will be impacted by proposed roads or wells. Ground clearing might impact habitat for unlisted species, including small birds, ground dwelling mammals, and other wildlife species. The 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* (916 USC 703-711). Fragmentation of native prairie habitat is a specific concern for grouse species, but the limited disturbance from exploration remains small in the landscape context.

Precautions benefitting all wildlife include:

- Locations overlying existing disturbances;
- Netting of the reserve pit in the interval between drilling and reclamation of the pit;
- Prompt removal of oil from open pits or ponds;
- Installation of covers on drip buckets under valves or spigots; and
- Prompt initial reclamation.

Final and complete reclamation will proceed immediately if the well is unproductive, or promptly after a commercial well is decommissioned. Wildlife inhabiting project areas are generally expected to adapt to changing conditions and continue to thrive.

3.6 Soils

The following paragraphs discuss soils found at the individual well sites. The Natural Resource Conservation Services (NRCS) soils data was reviewed prior to the on-site assessment and verified during the field visit. Generally, the wells addressed in this report are located on fine-grained soils with low to moderate erosion potential. The sites are suitable for construction and surface soils will allow for successful reclamation. Sites should be monitored for erosion and best management practices implemented to control erosion as necessary.

3.6.1 D-3 Dancing Bull #4-8H

The D-3 Dancing Bull #4-8H well site is located on a cultivated, convex hill with slopes 6-9 percent. The NRCS has identified one Mapping Unit (MU) that encompasses the proposed well site and access road. Williams and Zahl loams, 6-9% slopes are the major components in the mapping unit. The on site assessment verified that surface soils are a uniform silty clay with some sand present.

Soil Name	Pad Acres	Road Acres	Total Acres
Williams-Zahl	3.7	0.2	3.9

3.6.2 D-3 Elk #4-16H

The D-3 Elk #4-16H well site is located on a well-drained side slope with an approximate 5% grade. The NRCS has identified one Mapping Unit (MU) that encompasses the proposed well site and access road. Zahl-Williams loams are the major component in the mapping unit. The on site assessment found that topsoil is thin across the pad site (generally less than 4"). Gravely substrates are found at depths greater than four inches with calcium carbonate found at ten inches.

Soil Name	Pad Acres	Road Acres	Total Acres
Zahl-Williams	4.2	0.4	4.6

3.6.3 D-3 Shell Creek #4-7H

The D-3 Shell Creek #4-7H well site is located on a gently sloping cultivated field. Six mapping units are associated with this well pad and access road. The mapping units describe the soils as Williams-Zahl loams, Williams-Bowbells loams, Bowbells Loams and Max-Zahl loams, with differing slope attributes. The on-site assessment confirmed the presence of silty clay loams across the well site. Black topsoil is approximately 8-12" thick. The sand content increases as depth increases. Surface soils at the proposed site are suitable for construction and lend well to restoration.

Soil Name	Pad Acres	Road Acres	Total Acres
Williams-Zahl	0	4.2	4.2
Max-Zahl	0	2.0	2.0
Williams-Bowbells	4.2	3.0	7.2

3.6.4 D-3 T Smith #16-3H

The D-3 T Smith #16-3H well site is located on cultivated, relatively level ground. The NRCS has identified two Mapping Units (MU's) that encompass the proposed well site and access road. Williams and Zahl loams, 3-9% slopes are the major components in the mapping units. The on site assessment verified that surface soils are a uniform silty clay with some sand present. Surface soils at the site are suitable for construction and lend well for restoration.

Soil Name	Pad Acres	Road Acres	Total Acres
Williams-Zahl	3.7	0.4	4.1

3.7 Vegetation and Noxious Weeds

The Missouri Plateau Ecoregion (Missouri Slope) is a western mixed-grass and short-grass prairie (Bryce *et al.* 1998). The U.S. Department of Agriculture soil surveys for McLean and Mountrail Counties describe vegetation within the proposed project areas as mostly cultivated farmlands, native grasses, and wetland plants. Common grain and seed crops include wheat, oats, flax, canola, and barley. Native grasses include big bluestem, little bluestem, blue grama, side-oats grama, green needlegrass, and western wheatgrass. Typical wetland plants are smartweed, sedge species, bulrush, bluejoint and cattail. Woody draws, coulees, and drainages may host communities of chokecherry, buffaloberry, western snowberry and gooseberry.

3.7.1 D-3 Dancing Bull #4-8H

The proposed pad is located in a cultivated agricultural field. Crop re-growth was common and very few weeds were found on the site. The section line right-of-way has a dense stand of Kentucky bluegrass (*Poa pratensis*), intermediate wheatgrass (*Agropyron intermedium*), crested wheatgrass (*Agropyron cristatum*) and slender wheatgrass (*Agropyron caninum ssp. majus*). Smooth brome (*Bromus inermis*) is prevalent in the road ditch.

3.7.2 D-3 Elk #4-16H

Native grassland habitat exists upon this proposed north-sloping location. Blue grama (*Bouteloua gracilis*), threadleaf sedge (*Carex fillifolia*), prairie junegrass (*Koeleria pyramidata*) and needle and thread (*Stipa comata*) are the dominant species. Scattered forb species including owl clover (*Orthocarpus luteus*), purple coneflower (*Echinacea angustifolia*), silver leaf scurfpea (*Psoralea argophylla*), green milkweed (*Asclepias viridiflora*), purple prairie clover (*Dalea purpureum*) and the occasional prairie rose (*Rosa arkansana*). Residual cover was low at the time of the survey in July. Few weed species were found along the roadside in disturbed soils.

3.7.3 D-3 Shell Creek #4-7H

Vegetation along the existing two-track proposed to be used for the access road is primarily crested wheatgrass (*Agropyron cristatum*). In Section 7, the route turns southeast, crossing a native grassland area. Needle-and-thread (*Stipa comata*), threadleaf sedge (*Carex fillifolia*) and western wheatgrass (*Agropyron smithii*) are the dominant species.

Wetland species are present in the narrow, ephemeral drainage crossing. These include wetland sedges (*Carex* spp), prairie cordgrass (*Spartina pectinata*) and foxtail barley (*Hordeum jubatum*). Jerusalem artichoke (*Helianthus tuberosus*) was also beginning emergence at the time of survey.

3.7.4 D-3 T Smith #16-3H

Wheat stubble was present on the proposed site along with scattered weedy species including downy brome (*Bromus tectorum*), Russian thistle (*Salsola kali*), wild oats (*Avena fatua*), pigweed (*Amaranthus* sp.), pigeon grass (*Setaria viridis*) and others. Smooth brome (*Bromus inermis*) is present along the field perimeter. The existing road ditch is planted with blue grass (*Poa pratensis*) and western (*Agropyron smithii*), intermediate (*Agropyron intermedium*) and slender wheat grasses (*Agropyron caninum*).

3.7.5 Noxious Weeds

The North Dakota Agriculture Commission (ND Department of Agriculture 2002) identifies twelve noxious weed plant species in the state (Table 10). Nine of the twelve noxious weed species have been reported in at least one of the two counties. Absinth wormwood, Canada thistle, field bindweed, leafy spurge, musk thistle, saltcedar, and spotted knapweed are known to occur in both counties. Russian knapweed and yellow star thistle are also known to occur in McLean County (ND Department of Agriculture 2007). None of these were observed on the proposed well pad sites during the on-site assessment.

Table 10. Noxious weeds known to occur in McLean and Mountrail Counties

Common Name	Scientific Name	5 year (2003-2007) Average Reported Acres of Noxious Weeds ¹	
		McLean County	Mountrail County
Absinth wormwood	<i>Artemisia absinthium</i>	1,825	1,085
Canada thistle	<i>Cirsium arvense</i>	7,102	21,232
Dalmatian toadflax	<i>Linaria genistifolia</i>	NR	NR
Diffuse knapweed	<i>Centaurea diffusa</i>	NR	NR
Field bindweed	<i>Convolvulus arvensis</i>	1,756	1,429
Leafy spurge	<i>Euphorbia esula</i>	1,598	21,928
Musk thistle	<i>Carduus nutans</i>	193	2
Purple loosestrife	<i>Lythrum salicaria</i>	NR	NR
Russian knapweed	<i>Acroptilon repens</i>	5	NR
Saltcedar	<i>Tamarix spp.</i>	38	721
Spotted knapweed	<i>Centaurea maculosa</i>	3	164
Yellow starthistle	<i>Centaurea solstitialis</i>	5	NR

¹ North Dakota Department of Agriculture 2003-2007

² Not Reported

Potential disturbance of more than 27 acres and removal of existing soils and vegetation present opportunities for invasive species to threaten or reduce the quality or quantity of forage or crop production. However, the APDs and this EA require the operator to control noxious weeds throughout the project areas. Vehicles that have been driven in areas with invasive species must be cleaned with high-pressure sprayers before entering any project area.

Surface disturbance and vehicular traffic must not take place outside approved rights-of-way or the well pads. Areas stripped of topsoil must be re-seeded and reclaimed at the earliest opportunity. 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 reduce vegetative impacts to minimal levels, effectively negating the potential to establish or spread invasive species.

3.8 Cultural Resources

Cultural resources is a broad term encompassing sites, objects, or practices of archaeological, historical, cultural and religious significance. 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. 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). As a result, BIA consults and corresponds with the THPO on all projects proposed within the exterior boundaries of the Fort Berthold Reservation. The SHPO may have useful information, but has no official role regarding proposed federal actions on trust land. The MHA Nation has also designated responsible parties for consultations and actions under NAGPRA and cultural resources generally.

Cultural resource inventories of these well pads and access roads were conducted by personnel of Beaver Creek Archaeology, Inc., using a pedestrian methodology. For the D-3 Dancing Bull #4-8H and D-3 T. Smith #16-3H projects approximately 10 acres for each were intensively inventoried on November 12, 2008 (C. Burns 2008a, 2008b). For the D-3 Shell Creek #4-7H project approximately 23.4 acres were inventoried on May 12, 2009 (Pollman 2009); and for the D-3 Elk #4-16H project approximately 17 acres were inventoried on August 6, 2009 (Pollman and W. Burns 2009). No historic properties were located within any of these project areas 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 determinations of **no historic properties affected** for these undertakings. This determination was communicated to the THPO for the D-3 Dancing Bull #4-8H and D-3 T. Smith #16-3H projects on December 12, 2008; however, no response was received from the THPO within the allotted 30-day comment period. The same determination was communicated to the THPO for the D-3 Shell Creek #4-7H project on August 6, 2009 with the THPO concurring on August 17, 2009; and for the D-3 Elk #4-16H project on August 26, 2009, with the THPO concurring on September 11, 2009 (see Part 4).

3.9 Socioeconomics

Socioeconomic conditions include population, demographics, income, employment, and housing. These conditions can be analyzed and compared at various scales. This analysis focuses on the reservation, the four counties that overlap most of the Reservation and the state of North Dakota. The state population showed little change between the last two censuses (1990–2000), but there were notable changes locally, as shown in Table 3.9a. Populations in Dunn, McKenzie, McLean, and Mountrail counties declined 5 to 11%, while population on the Fort Berthold Reservation increased by almost 10%. These trends are expected to continue (Rathge *et al.* 2002). While American Indians are the predominant group on the reservation, they are a minority elsewhere in the state. More than two-thirds (3,986) of the Reservation population are tribal members.

Table 3.9a: Population and Demographics

County or Reservation	Population in 2000	% of State Population	% Change 1990-2000	Predominant Group	Predominant Minority
Dunn County	3,600	0.56%	- 10.1%	White	American Indian (12%)
McKenzie County	5,737	0.89%	- 10.1%	White	American Indian (21%)
McLean County	9,311	1.45%	- 11.0%	White	American Indian (6%)
Mountrail County	6,631	1.03%	- 5.6%	White	American Indian (30%)
Fort Berthold Reservation	5,915	0.92%	+ 9.8%	American Indian	White (27%)
Statewide	642,200	100%	+ 0.005%	White	American Indian (5%)

Source: U.S. Census Bureau 2007.

In addition to the ranching and farming that are employment mainstays in western North Dakota, employment on the reservation largely consists of ranching, farming, tribal government, tribal enterprises, schools, and federal agencies. The MHA Nation’s Four Bears Casino and Lodge, near New Town, employs over 320 people, 90% of which are tribal members (Three Affiliated Tribes 2008).

As shown in Table 3.9b, counties overlapping the Reservation tend to have per capita incomes, median household incomes, and employment rates that are lower than North Dakota statewide averages. Reservation residents have lower average incomes and higher unemployment rates compared to the encompassing counties. MHA Nation members are in turn disadvantaged relative to overall Reservation incomes and unemployment rates that average in non-Indian data. The most recent census found that per capita income for residents of the Reservation is \$10,291 (less than 1/3 the state average). Overcrowded housing skews the median reservation household income upward to \$26,274 (about 1/3 the state average). A BIA report in 2003 found that 33% of *employed* MHA Nation members were living below federal poverty levels. The unemployment rate for tribal members is 22 %, compared to 11.1% for the reservation as a whole and 4.6% statewide.

Table 3.9b: Income and Unemployment

Unit of Analysis	Per Capita Income	Median Household Income	Unemployment Rate (2007)	Employed but Below Poverty Level	Percent of All People in Poverty
MHA Nation members	--	--	22 %	33 %	Unknown
Fort Berthold Reservation	\$ 10,291	\$ 26,274	11.1 %	--	Unknown
Mountrail County	\$ 29,071	\$ 34,541	5.8 %	--	15.4%
Dunn County	\$ 27,528	\$ 35,107	3.4 %	--	13%
McKenzie County	\$ 27,477	\$ 35,348	3.1 %	--	15.8 %
McLean County	\$ 32,387	\$ 37,652	4.7 %	--	12.8%
North Dakota	\$ 31,871	\$ 40,818	3.2 %	--	11.2 %

Source: U.S. Department of Agriculture Economic Research Data 2008 and BIA 2003.

Availability and affordability of housing could impact oil and gas development and operations. Housing information is summarized in Table 3.9c. The tribal 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. Private purchase and rental housing are available in New Town. New housing construction has recently increased within much of the analysis area, but availability remains low.

Table 3.9c: Housing Units – 2000 (U.S. Census Bureau 2007 and 2008).

Housing Development	Fort Berthold Reservation	Dunn County	McKenzie County	McLean County	Mountrail County
Existing Housing					
Owner-Occupied Units	1,122	1,570	2,009	4,332	2,495
Renter-Occupied Units	786	395	710	932	941
Total	1,908	1,965	2,719	5,264	3,436
New Private Housing Building Permits 2000-2005	--	18	4	135	113
Housing Development Statistics					
State rank in housing starts	--	51 of 53	15 of 53	21 of 53	17 of 53
National rank in housing starts	--	3112 / 3141	2498 / 3141	2691 / 3141	2559 / 3141

The proposed project is not expected to have measurable impacts on population trends, local unemployment rates or housing starts. Relatively high-paying construction jobs would result from exploration and development of oil and gas reserves on the reservation, but most of these opportunities are expected to be short-term. The proposed action would require temporary employees during the well construction cycle and one to two full-time employees for the long-term production cycle. Short-term construction employment would provide some economic benefit. Long-term commercial operations would provide significant royalty income and indirect economic benefits.

3.10 Environmental Justice

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

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

Environmental Justice is an evolving concept with potential for disagreement over the scope of analysis and the implications for federal responsiveness. It is nevertheless clear that tribal members on the Great Plains qualify for EJ consideration as both a minority and low-income population. The population of the Dakotas is predominantly Caucasian. While some 70% of Reservation residents are tribal members, Indians comprise only 5% of North Dakota residents and 12% of the population of Dunn County. Even in a state with relatively low per capita and household income, Indian individuals and households are distinctly disadvantaged.

There are, however, some unusual EJ considerations when proposed federal actions are meant to benefit tribal members. Determination of fair treatment necessarily considers the distribution of both benefits and negative impacts, due to variation in the interests of various tribal groups and individuals. There is also potential for major differences in impacts to resident tribal members and those enrolled or living elsewhere. A general benefit to MHA Nation government and infrastructure has already resulted from tribal leasing, fees and taxes. Oil and gas leasing has also already brought much-needed income to MHA Nation members who hold mineral interests, some of whom might eventually benefit further from royalties on commercial production. Profitable production rates at proposed locations might lead to exploration and development on additional tracts owned by currently non-benefitting allottees. The absence of lease and royalty income does not, moreover, preclude other benefits. Exploration and development would provide many relatively high-paying jobs, with oversight from the Tribal Employment Rights Office.

The owners of allotted surface within the project areas may not 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 compensatory for productive acreage lost to road and well pad or pipeline construction. Tribal members without either surface or mineral rights would not receive any direct benefits whatsoever. Indirect benefits of employment and general tribal gains would be the only potential offsets to negative impacts.

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 significantly reduced following the surveys of proposed project locations and determination by the BIA that there will be no historic properties affected. Nothing is known to be present, furthermore, that qualifies for protection under the *American Indian Religious Freedom Act*. Potential for disproportionate impacts is further mitigated by requirements for immediate work stoppage following an unexpected discovery of cultural resources of any type. Mandatory consultations 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 significant impacts to any other critical element—air, public health and safety, water, wetlands, wildlife, soils or vegetation—within the human environment. Avoiding or minimizing such impacts also makes unlikely disproportionate impacts to low-income or minority populations. The proposed action offers many positive consequences for tribal members, while recognizing Environmental Justice concerns. Procedures summarized in this document and in applicable laws, rules and orders are binding and sufficient. No laws, regulations or other requirements have been waived; no compensatory mitigation measures are required.

3.8 Mitigation and Monitoring

Many protective measures and procedures are described in this document and in the APDs. 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.

3.9 Irreversible and Irretrievable Commitment of Resources

Removal and consumption of oil and/or gas from the Bakken Formation will be an irreversible and irretrievable commitment of resources. Other potential resource commitments include acreage devoted to disposal of cuttings, soil lost through wind and water erosion, cultural resources inadvertently destroyed, wildlife killed during earthmoving or in collisions with vehicles, and energy expended during construction and operation.

3.10 Short-Term Use versus Long-Term Productivity

Short-term activities will not detract significantly from long-term productivity of the project areas. The small areas dedicated to the access roads and well pads will be unavailable for livestock grazing, wildlife habitat, and other uses. Allottees with surface rights will be compensated for loss of productive acreage and project footprints will shrink considerably once wells are drilled and non-working areas are reclaimed and reseeded. Successful and ongoing reclamation of the landscape will quickly support wildlife and livestock grazing, stabilize the soil, and reduce the potential for erosion and sedimentation. The major long-term resource loss corresponds with the project purpose: extraction of hydrocarbons from the Bakken Formation.

3.11 Cumulative Impacts

The landscape and vegetation of the Great Plains have undergone continual transformations due to the influences of nature and human actions. Cumulative effects have occurred as a loss and alteration of habitats caused by cultivation, range management practices, fire suppression, exotic species introductions, resource development, and other practices. Environmental impacts may accumulate either over time or in combination with similar activities in the area. Unrelated activities may also have negative impacts on critical elements, thereby contributing to cumulative degradation of the environment. Past and current disturbances in the vicinity of the proposed projects include farming, grazing, roads, and other oil/gas wells. Current land uses are expected to continue with little change, since undivided interests in the land surface are often held by tribal members other than those holding mineral rights. Virtually all available acreage is already organized into agricultural leases or range units to utilize surface resources for economic benefit; oil and gas development is not expected to have more than a minor effect on surface use patterns.

There will be minimal ground disturbing activities to lands that have not been previously cultivated or otherwise physically manipulated. Only one site will disturb native prairie. There are no wetlands, floodplains, or major drainage facilities that will be significantly affected negatively by the proposed well sites. Current land uses are expected to continue with little change other than that the acreage required for development will not be cultivated. Increased truck traffic on adjacent roadways can be expected and has a documented negative, but manageable, impact on road conditions.

The major activity with potential to impact critical elements of the human environment is oil field development. Over the past several years, exploration has accelerated over the Bakken Formation. Most of this exploration has taken place outside the reservation boundary on fee land, but for purposes of cumulative impact analyses, land ownership and the reservation boundary are immaterial. Perimeters of 1, 5, 10, and 20 miles around the proposed well sites were therefore evaluated to determine the level of oil and gas activity in the surrounding area, as shown in Table 11 and Figure 17. There are three active wells within five miles of the sites considered in this document with at least 16 proposed known or confidential sites in the area. The immediate area is largely undeveloped. Within ten miles, there are 18 wells. Within 20 miles, there are 259 active oil and gas wells, the vast majority of which are outside the reservation to the north.

Table 11. Oil and Gas Well Status in Area

Distance from Well Sites	Active Wells	Confidential or Proposed Wells	Permitted to Drill	Currently Drilling ¹	Totals
0-1 miles	0	3	0	0	3
1-5 miles	3	16	0	0	19
5-10 miles	15	26	11	7	59
10-20 miles	241	104	25	9	379
Cumulative Total (20-mile radius)	259	151	35	16	461
Fort Berthold Reservation	90	105	17	13	225

¹NDIC OG well status – September 14, 2009

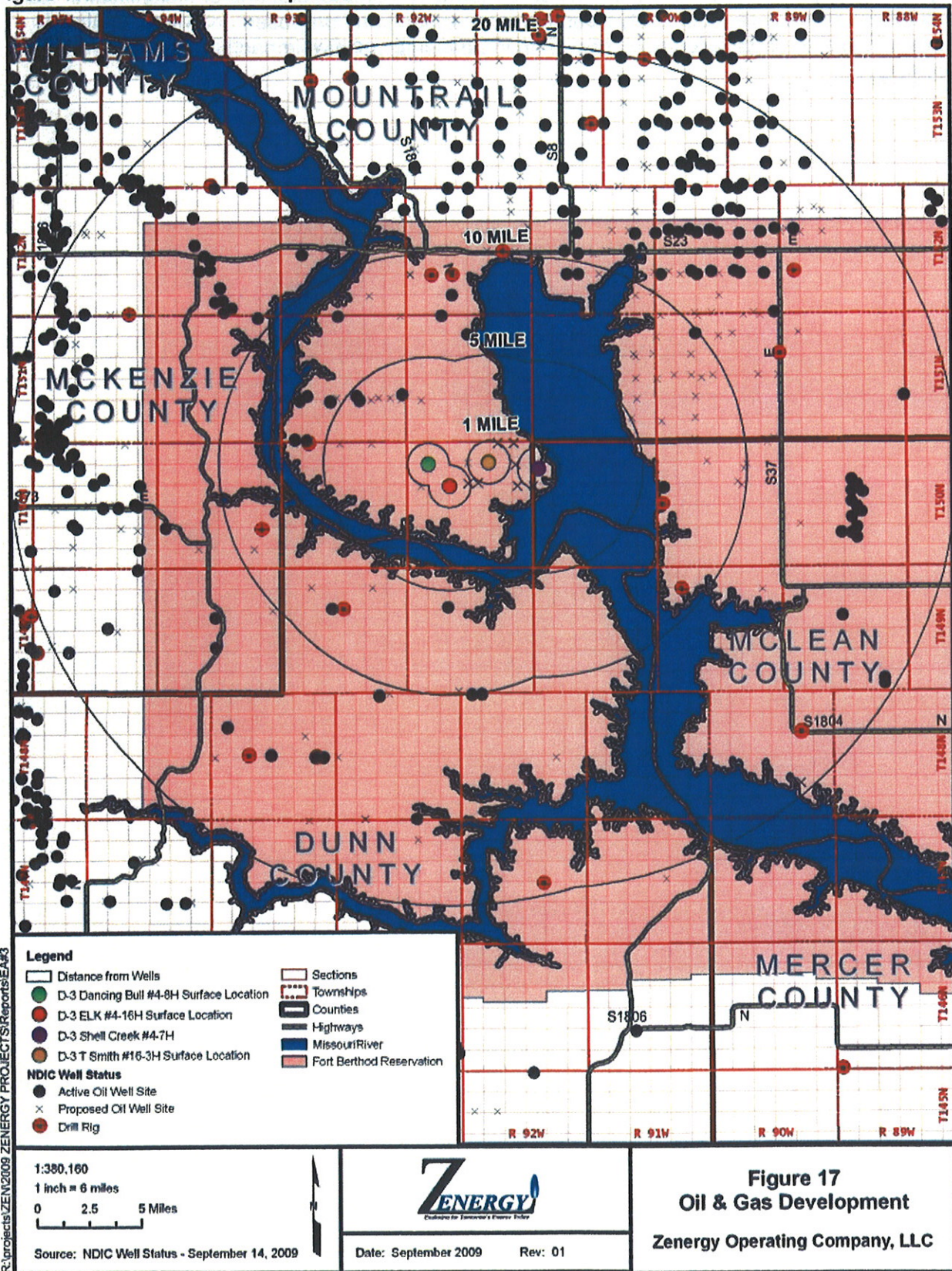
Within the reservation and near the proposed sites, installations remain few and dispersed. None of the projects proposed in this EA will share roads with any existing installation, but collateral use will occur with other proposed well sites. Commercial success at any new well might result in additional oil/gas exploration proposals, but such developments are speculative at this time until APDs are submitted to BLM or BIA. Zenergy has suggested more wells are proposed or are in the planning process and may eventually be drilled in the same general area. Such developments will rely wherever possible on shared roads, centralized and downsized facilities, and other opportunities to reduce surface disturbance and impacts to the human environment.

Approved oil/gas leases may lead to additional exploration and development, but additional analysis and BIA approval will be required before the surface is disturbed at any other location. Potential impacts from possible future development cannot be meaningfully analyzed at this time. Not only is the level of development highly sensitive to volatile commodities prices, but additional development may increase interest in pipelines, thereby *reducing* impacts to certain critical elements of the human environment, such as public safety and air quality.

Proposed actions have been planned to avoid impacts to wetlands, floodplains, surface water, cultural resources, and threatened and endangered species. Unavoidable impacts to these or other resources will be minimized and/or mitigated as described in this document. The operator of any facility will be required to complete interim reclamation of roads and well pads immediately following construction and completion. Implementation of other precautionary and protective measures detailed in this EA, the APDs, and applicable regulations are expected to minimize impacts to all critical elements of the human environment. Impacts from the proposed

projects are expected to generally be minor, temporary, manageable, and/or insignificant. No cumulative impacts are reasonably foreseen from existing and proposed activities, relative to the existing scale of development, other than increasingly positive impacts to the reservation economy.

Figure 17. Gas and Oil Development



4.0 Consultation and Coordination

The Bureau of Indian Affairs has completed many Environmental Assessments (EAs) for oil and gas projects at Fort Berthold since 2007. For the first 18 of these projects, prior notice was sent to about 60 tribes, government agencies, non-profit organizations, and individuals. BIA consulted directly and repeatedly with the U.S. Fish and Wildlife Service to identify issues and incorporate best management practices for wildlife protection. BIA also routinely cooperated on every project with the Bureau of Land Management regarding operational standards and reclamation procedures.

Responses to previous notifications quickly became repetitious, usually consisting of form letters advising BIA that the respondent had no concerns or that the same general concerns applied to every project proposal. BIA has therefore discontinued mailing of individual notices for Fort Berthold oil and gas environmental review, except where proposal include unusual components not previously considered with other interested parties. There are no such components to the proposal analyzed in this EA. BIA is satisfied that the proper scope of analysis for such project is known.

The justified simplification of NEPA procedures does not impact in any way BIA practices regarding cultural resource regulations and standard practices under the National Historic Preservation Act. Correspondence with the Tribal Historic Preservation Officer is reproduced below.



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 12 2008

Perry 'No Tears' Brady, THPO
Mandan, Hidatsa and Arikara Nation
PO Box 429
Parshall, North Dakota 58770

Dear Mr. Brady:

We have considered the potential effects on cultural resources of three oil well pads in Mountrail County, North Dakota. Approximately 30 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the areas depicted in the enclosed reports. No historic properties were located that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No resources were located that appear to qualify for protection under the American Indian Religious Freedom Act (16 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. Catalogued as **BIA Case Number AAO-1584/FB/09**, the proposed undertakings, locations, and project dimensions are described in the following reports:

Burns, Christina

- (2008) Van Hook – Dancing Bull #4-8H Well Pad: A Class III Cultural Resource Inventory, Mountrail County, ND. Beaver Creek Archaeology, Inc. for Stephens Energy Company, LLC, Denver.
- (2008) Van Hook – R/S #16-4H Well Pad: A Class III Cultural Resource Inventory, Mountrail County, ND. Beaver Creek Archaeology, Inc. for Stephens Energy Company, LLC, Denver.
- (2008) Van Hook – T. Smith #16-3H Well Pad: A Class III Cultural Resource Inventory, Mountrail County, ND. Beaver Creek Archaeology, Inc. for Stephens Energy Company, LLC, Denver.

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

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

Sincerely,

(sgd) Weldon Loudermilk

ACTING Regional Director

Enclosures

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

FILE COPY

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B. Bruce

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United States Department of the Interior

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



IN REPLY REFER TO:
DESCRM
MC-208

AUG 06 2009

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 McLean and Mountrail Counties, North Dakota. Approximately 23.4 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. No historic properties were located that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (16 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-1623/FB/09**, the proposed undertaking, location, and project dimensions are described in the following report:

Pollman, Jennifer
(2009) Dakota-3 Shell Creek #4-7H Well Pad and Access Road: A Class III Cultural Resource Inventory, Mountrail & McLean Counties, North Dakota. Beaver Creek Archaeology for Zenergy Operating Company, LLC, Tulsa, OK.

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

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

Sincerely,

ACTING Regional Director

Enclosures

cc: Chairman, Three Affiliated Tribes
Superintendent, Fort Berthold Agency
Chief, Division of Energy and Environment



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

August 17, 2009

Carson Murdy
Regional Archeologist
Bureau of Indian Affairs
Great Plains Regional Office
115 Fourth Avenue SE
Aberdeen, SD, 57401


RE: Project # AAO-1623/FB/09
Dakota-3 Shell Creek 4-7H well pad and access road

Dr. Murdy:

After review of the documentation provided, the Mandan Hidatsa Arikara Nations Tribal Historic Preservation Office concurs with the determination of 'No Adverse Affect'/No Historic Properties Affected' to any pre and post-historic relics, artifacts or sacred and cultural resources in the revised proposed Project area.

We respectfully request to be notified should any NAGPRA issue or others arise as the Project progresses.

Sincerely,


Perry 'No Tears' Brady,
Tribal Historic Preservation Officer,
Mandan Hidatsa Arikara Nations.



United States Department of the Interior

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



IN REPLY REFER TO:
DESCRM
MC-208

AUG 26 2009

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 four oil well pads, an access road and a gas pipeline in Mountrail, Dunn and McKenzie Counties, North Dakota. Approximately 58.6 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the areas depicted in the enclosed reports. One historic structure was located, but which does not 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. Ten properties, "avoidance areas," were located that may qualify for protection under the American Indian Religious Freedom Act (16 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 the avoidance areas will be avoided. Catalogued as **BIA Case Number AAO-1651/FB/09**, the proposed undertakings, locations, and project dimensions are described in the following reports:

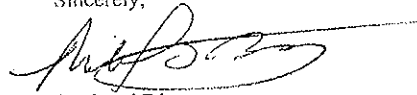
Pollman, Jennifer, and Wade Burns

- (2009) Dakota-3 Adeline #15-5H Well Pad: A Class III Cultural Resource Inventory, Mountrail County, North Dakota. Beaver Creek Archaeology for Zenergy Operating Company, LLC, Tulsa, OK.
- (2009) Dakota-3 Elk #4-16H Well Pad: A Class III Cultural Resource Inventory, Mountrail County, North Dakota. Beaver Creek Archaeology for Zenergy Operating Company, LLC, Tulsa, OK.
- (2009) Dakota-3 Mason #2-22H Well Pad and Access Road: A Class III Cultural Resource Inventory, Mountrail County, North Dakota. Beaver Creek Archaeology for Zenergy Operating Company, LLC, Tulsa, OK.
- (2009) Dakota-3 Pennington #16-15H Gas Line Connection: A Class III Cultural Resource Inventory, Mountrail County, North Dakota. Beaver Creek Archaeology for Zenergy Operating Company, LLC, Tulsa, OK.
- (2009) Dakota-3 Strahs #4-31H Well Pad: A Class III Cultural Resource Inventory, Dunn and McKenzie Counties, North Dakota. Beaver Creek Archaeology for Zenergy Operating Company, LLC, Tulsa, OK.

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

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

Sincerely,



Regional Director

Enclosure

cc: Chairman, Three Affiliated Tribes
Superintendent, Fort Berthold Agency
Chief, Division of Energy and Environment



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

September 11, 2009

Carson Murdy
Regional Archeologist
Bureau of Indian Affairs
Great Plains Regional Office
115 Fourth Avenue SE
Aberdeen, SD, 57401

RE: Project # AAO-1651/FB/09

Dakota 3 Adeline 15-5H well pad

Dakota 3 Elk 4-16H well pad

Dakota 3 Mason 2-22H well pad and access road

Dakota 3 Pennington 16-15H Gas line connection

Dakota 3 Strahs 4-31H well pad

Dr. Murdy:

After review of the documentation provided, the Mandan Hidatsa Arikara Nations Tribal Historic Preservation Office concurs with the determination of 'No Historic Properties Affected' to any pre and post-historic relics, artifacts or sacred and cultural resources in the Project areas.

We respectfully request to be notified should any NAGPRA issue or others arise as the Project progresses.

Sincerely,

Perry 'No Tears' Brady,
Tribal Historic Preservation Officer,
Mandan Hidatsa Arikara Nations.

5.0 List of Preparers

An interdisciplinary team contributed to this document, following guidance in Part 1502.6 of CEQ regulations. Portions of the documents were drafted by McCain and Associates, Inc, under contract to Zenergy and under the direction of BIA. Federal officials, oil and gas representatives, and consultants included the following:

Bureau of Indian Affairs

Division of Environmental, Safety and Cultural Resource Management

Zenergy Operating Company, LLC

Kelley Bryan, Landman and Project Manager

McCain and Associates, Inc.

Todd Hartleben, Professional Engineer

Kathie Kjar, Senior Ecologist

Ryan Krapp, Wildlife Biologist/GIS Specialist

Greg Meyer, Ecologist

6.0 References and Acronyms

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- Burns, Christina. 2008b. Van Hook – T. Smith #16-3H Well Pad: A Class III Cultural Resource Inventory, Mountrail County, ND. Beaver Creek Archaeology, Inc. for Stephens Energy Company, LLC, Denver.
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Pollman, Jennifer, and Wade Burns. 2009. Dakota-3 Elk #4-16H Well Pad: A Class III Cultural Resource Inventory, Mountrail County, North Dakota. Beaver Creek Archaeology for Zenergy Operating Company, LLC, Tulsa, OK.

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Acronyms

AAQM	Ambient Air Quality Monitoring (site)
AIRFA	American Indian Religious Freedom Act
APD	Application for Permit to Drill
APE	Area of Potential Affect
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FONSI	Finding of No Significant Impact
GPRO	Great Plains Regional Office
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
NDNH	North Dakota Natural Heritage
NDSWC	North Dakota State Water Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPAL	Northern Plains Agro-ecosystems Laboratory
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTL	Notice to Lessees
SHPO	State Historic Preservation Officer
TCP	Traditional Cultural Property
TERO	Tribal Employment Rights Office
THPO	Tribal Historic Preservation Officer
TVD	Total Vertical Depth
USC	United States Code

USFS United States Forest Service
USFWS United States Fish and Wildlife Service
USGS United States Geological Survey

Notice of Availability and Appeal Rights

Zenergy: D-3 Dancing Bull #4-8H
D-3 Elk #4-16H
D-3 Shell Creek #4-7H
D-3 T. Smith #16-3H

The Bureau of Indian Affairs (BIA) is planning to issue administrative approvals related to installation of an oil/gas wells as shown on the attached map. Construction by Zenergy Oil and Gas is expected to begin in 2009.

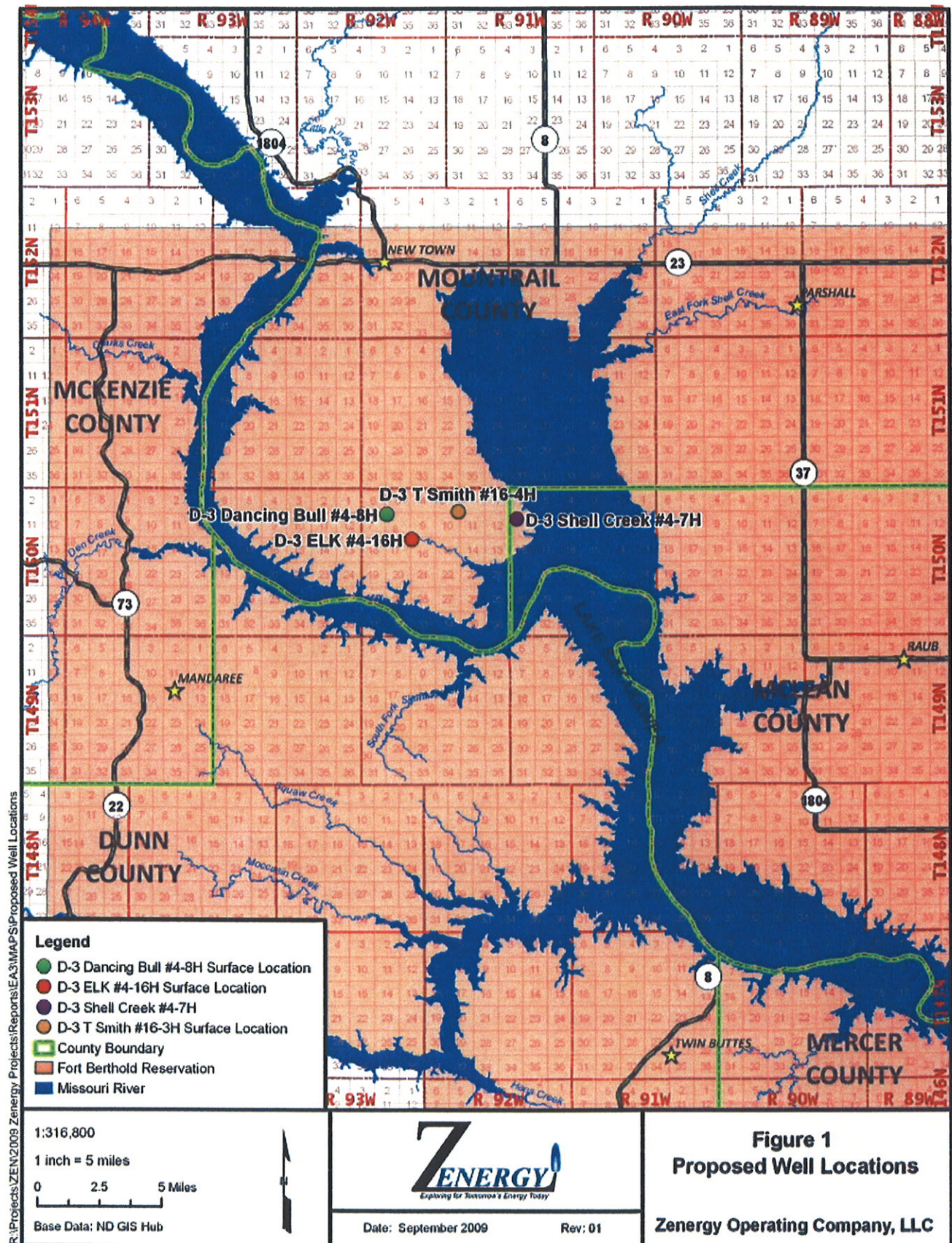
An environmental assessment (EA) determined that proposed activities will not cause significant impacts to the human environment. An environmental impact statement is not required. Contact Howard Bemer, Superintendent at 701-627-4707 for more information and/or copies of the EA and the Finding of No 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 October 31, 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 location.



R:\Projects\ZEN\2008_Zenergy_Projects\Reports\EA\3\MAPS\Proposed Well Locations