

# **ENVIRONMENTAL ASSESSMENT**

**United States Bureau of Indian Affairs**

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



**Marathon Oil Company**

**One Bakken Formation Exploratory Well:**

**Henry Charging-USA #21-3H**

**Fort Berthold Indian Reservation**

**September 2009**

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## Finding of No Significant Impact

### Marathon Oil Company

### Henry Charging USA #21-3H

### Fort Berthold Indian Reservation Mountrail County, North Dakota

The U.S. Bureau of Indian Affairs (BIA) has received a proposal for one oil/gas well, access road and related infrastructure on the Fort Berthold Indian Reservation to be located in Section 3 of Township 150 North, Range 93 West. Associated federal actions by BIA include a determination 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 Application for Permit to Drill.

Potential of the proposed action 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 project will not significantly affect the quality of the human environment. No Environmental Impact Statement is required for any portion of the proposed activities.

This determination is based on the following factors:

1. Agency and public involvement was solicited and environmental issues related to the proposal were identified.
2. Protective and prudent measures were designed to minimize impacts to air, water, soil, vegetation, wetlands, wildlife, public safety, water resources, and cultural resources. The remaining potential for impacts was disclosed for both the proposed action and the No Action alternative.
3. Guidance from the U.S. Fish and Wildlife Service has been fully considered regarding wildlife impacts, particularly in regard to threatened or endangered species.
4. The proposed action is 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 project will improve the socio-economic condition of the affected Indian community.

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

9/29/09  
\_\_\_\_\_  
Date

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## 1. Purpose and Need for the Proposed Action

Marathon Oil Company (Marathon) is proposing to drill a horizontal oil/gas well on the Fort Berthold Indian Reservation to evaluate and potentially develop the commercial potential of natural resources. This development has been proposed on land held in trust by the United States in Mountrail County, North Dakota. 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 the subsurface mineral rights. The well will be drilled from the surface location shown in Figure 1. For purposes of this document, the project and location will be referred to as Henry Charging.

The economic development of available resources and associated BIA actions are consistent with BIA's general mission. Leasing and development of mineral resources offer 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 project are largely administrative and include approval of leases, easements and rights-of-way, a determination regarding cultural resource effects and recommendations to the Bureau of Land Management (BLM) regarding approval of the Application for Permit to Drill (APD).

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. An APD submitted by Marathon on 26 August 2009 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 proposal 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 the proposed action. A small access road from an existing road will serve as access to the proposed well site. A well pad would be constructed to accommodate drilling operations. A pit for drill cuttings would be constructed, used and reclaimed. Drilling and completion information could result in long-term commercial production, in which case supporting facilities would be installed. The working portions of the pad and access road would remain in place during commercial production. All project components would eventually be abandoned and reclaimed, as specified in this document and the APD and according to any other federal conditions, unless formally transferred with federal approval to either the BIA or the landowner. The proposed well is exploratory, in that results could 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 well and directly associated infrastructure and facilities. Additional NEPA analysis, decisions and federal actions will be required prior to any other development.

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.

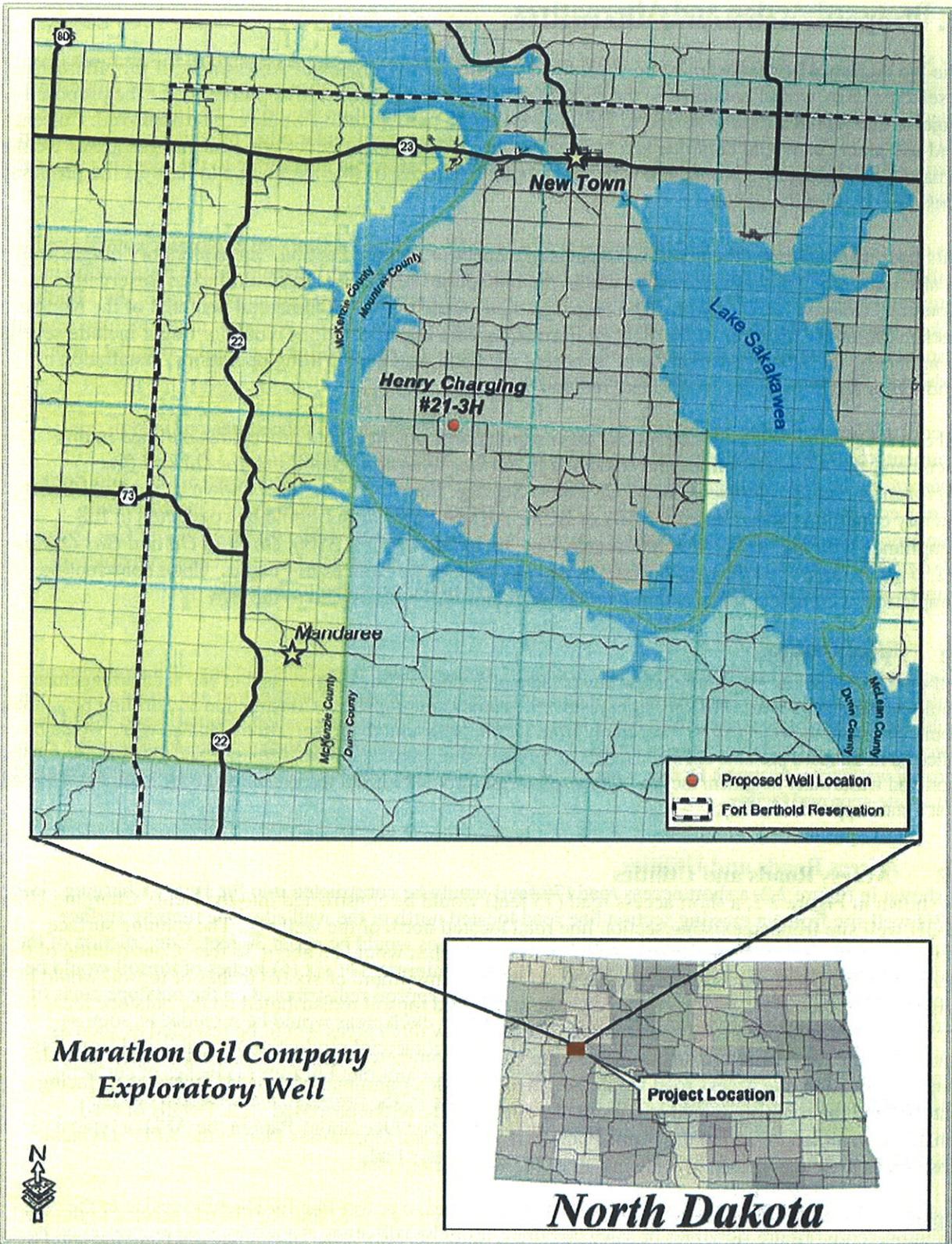


Figure 1: Project locations.

## 2. Proposed Action and Alternatives

The **No Action Alternative** must be considered within an Environmental Assessment. If this alternative is selected, BIA would not approve the right-of-way or other administrative proposals for the proposed project. The Application for Permit to Drill (APD) for the well location would not be approved. Current land use practices would continue at a No Action site. Development under other oil and gas leases would remain a possibility, but No Action is the only available or reasonable alternative to the specific proposal considered in this document.

This document analyzes the potential impacts of a specific proposed action - an exploratory oil/gas well on allotted surface and mineral estate within the boundaries of the Fort Berthold Indian Reservation in Mountrail County, North Dakota. The proposed well would test the commercial potential of the Middle Bakken Dolomite Member of the Bakken Formation. Site-specific actions would or might include several components, including construction of an access road and well pad, drilling operations, installation of production facilities, tanker traffic and reclamation.

All construction activities would follow lease stipulations, practices and procedures outlined in this document, the APD, guidelines and standards in *Surface Operating Standards for Oil and Gas Exploration 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 would 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. Upon construction completion, a complete set of as-built survey drawings will be provided to the BIA.

### 2.1 Field Camps

Self-contained trailers may house a few key personnel during drilling operations, but any such arrangements would be very short-term. No long-term residential camps are proposed. Construction and drilling personnel would commute to project sites, most likely from within or around the Reservation. Human waste would 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 would be collected in enclosed containers and disposed of at a state-approved facility.

### 2.2 Access Roads and Utilities

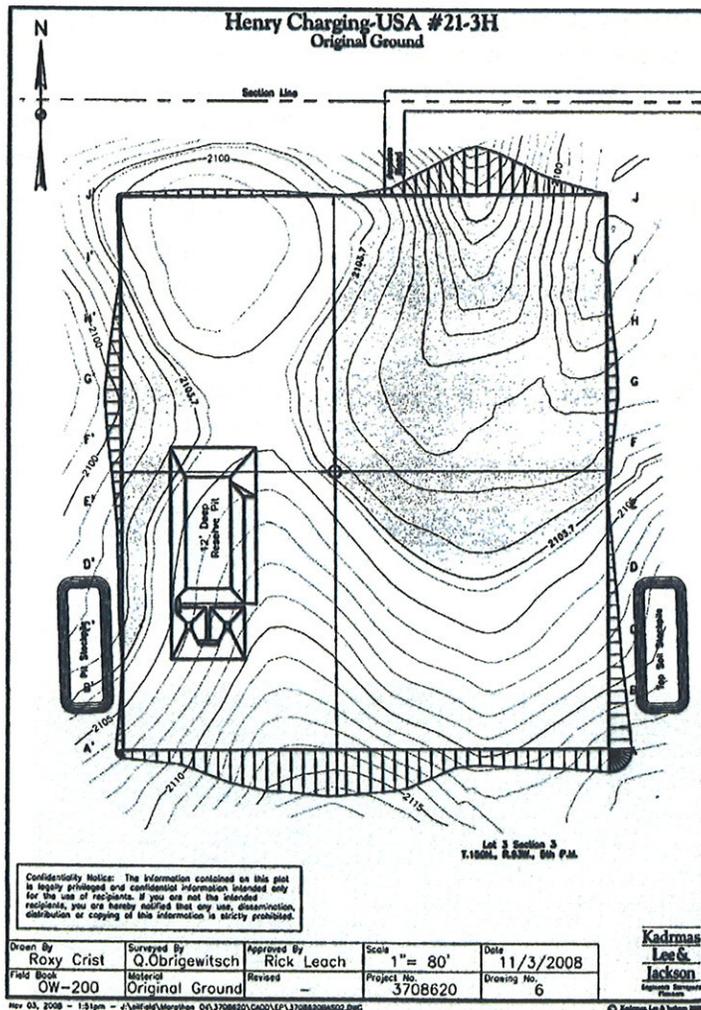
As shown in Figure 2.2, a short access road (75 feet) would be constructed into the Henry Charging USA 21-3H well site from an existing section line road located north of the well site. The running surface would be about 20 feet wide; overall width including ditches would be about 36 feet. Construction of the road would follow design standards in the Gold Book. A minimum of six (6) inches of topsoil would be stripped from the access road corridor, with the stockpiled topsoil redistributed on the outslope areas of borrow ditches following road construction. These borrow ditch areas would be reseeded as soon as practical with a seed mixture determined by the BIA. If commercial production is established from this proposed location, the access road would be graveled with a minimum of four (4) inches of surfacing material and the roadway would remain in place for the life of the proposed well. Details of road construction are addressed in the Multi-Point Surface Use and Operations Plan in the APD; a typical cross-section view is shown in Drawing 10 of the well survey plat.

Separate rights-of-way are proposed for up to four pipelines, a power line for electric service to the well site and potential future flowlines or sales pipelines, all to be laid along the access road and installed by a separate service provider. Electrical service would consist of a 3-phase, 75 KVA, 7.2 KV, 277/480 volt line. The preference is to bury the electrical service line (30"- 48" below the surface), but unknown conditions at the time of installation may require above ground service. Pipelines to carry oil, gas and

produced water would be 4-12 inches in diameter, buried at a depth of about four feet. Topsoil would be stripped and stockpiled to the non-working side of the ROW prior to trenching. After pipelines and risers are installed, the system would be pressure-tested and tracer wires and marking tapes would be installed. Immediately after installation, trenches would be backfilled with excavated material and covered with topsoil. Final reclamation and re-seeding would take place at the earliest practicable time. Timing of reclamation would be determined by BIA, but will not exceed seven months after excavation.

The minimum safe distance of 65 feet between pipelines and electrical transmission lines would be observed. The maximum disturbed right-of-way width of 80 feet would result in a less than 0.15 acres of surface disturbance. Signed agreements would be in place with affected surface owners prior to road or utility construction.

If power or pipeline companies choose routes that do not closely parallel the access road, additional NEPA analysis will be required for alternate routes. If utilities are not installed during access road construction, additional analysis will be required prior to approval of the resulting 150-wide construction ROW.



### 2.3 Well Pads

The proposed well pad would consist mainly of 1) an area leveled for the drilling rig and related equipment; and 2) a pit excavated for drilling fluids, drill cuttings and fluids produced during drilling. The area would be cleared of vegetation, stripped of topsoil and graded to specifications in the approved APD to ensure positive water drainage away from the well and around the site. Topsoil would be stockpiled on the east side of the pad and stabilized until disturbed areas were reclaimed and re-vegetated during initial reclamation. Erosion control would be maintained through prompt re-vegetation and by constructing all necessary surface water drainage control structures, including berms, culverts, diversion ditches and waterbars. The control structures may include both run-on and run-off controls.

The well pad would be about 400 feet from east to west and about 450 feet north to south. The area is relatively level with the greatest cut being 8.9 feet in the SE corner. There is a 3.0 foot cut in the southwest corner, a 1.2 foot cut in the northwest corner and a minor fill of 0.3 feet in the in the northeast corner. All fill end slopes are designed as 3:1 slopes. All cut end slopes less than eight (8) feet are designed at 2:1 slopes and 3:1 for cuts greater than eight (8) feet. Excavated subsoil would be used in pad construction. Total disturbance for construction of the pad and access from the new section line road is 4.57 acres. Figures 2.3a and 2.3b show a well pad view and pad schematic respectively.

A reserve pit is needed for drilling and completion work, even when a closed-loop system is employed. The pit would be entirely in the cut area of the pad and would measure either 70' x 90' x 14' deep or about 170' x 70' x 12' deep. This design decision is contingent on the drill rig deployed and the auxiliary equipment, such as a cuttings dryer and a closed drilling fluid handling system. The pit would be lined with an impervious (20 mil) liner to prevent fluid seepage and contamination of the underlying soil. Liners would be installed over sufficient bedding (either straw or dirt) to cover any rocks, would overlap the pit walls, extend under the mud tanks, and would be covered with dirt and/or rocks to hold it in place. Oil-based fluids would be recycled during and after use at this site. Cuttings, mud and water would be processed through a centrifuge, with the partially dried cuttings deposited in one part of the pit.

Prior to use, the reserve pit would be fenced completely with a cattle guard at the access road into location, in order to protect both wildlife and livestock. Fencing would be installed in accordance with Gold Book guidelines and maintained until the reserve pits are backfilled. Details of pad construction and reclamation are described and diagrammed in the Surface Use Plan of the APD.

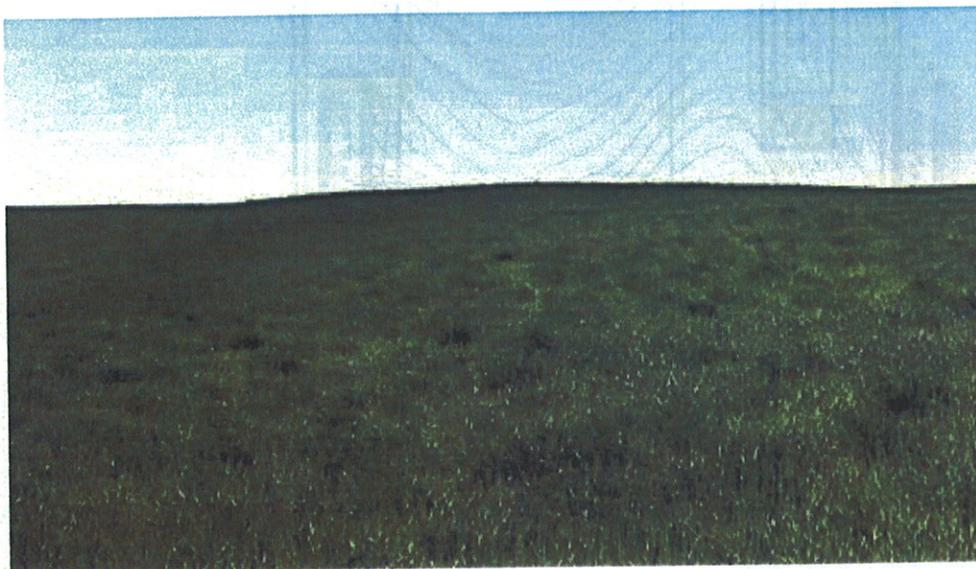


Figure 2.3a: Well Pad Site View South

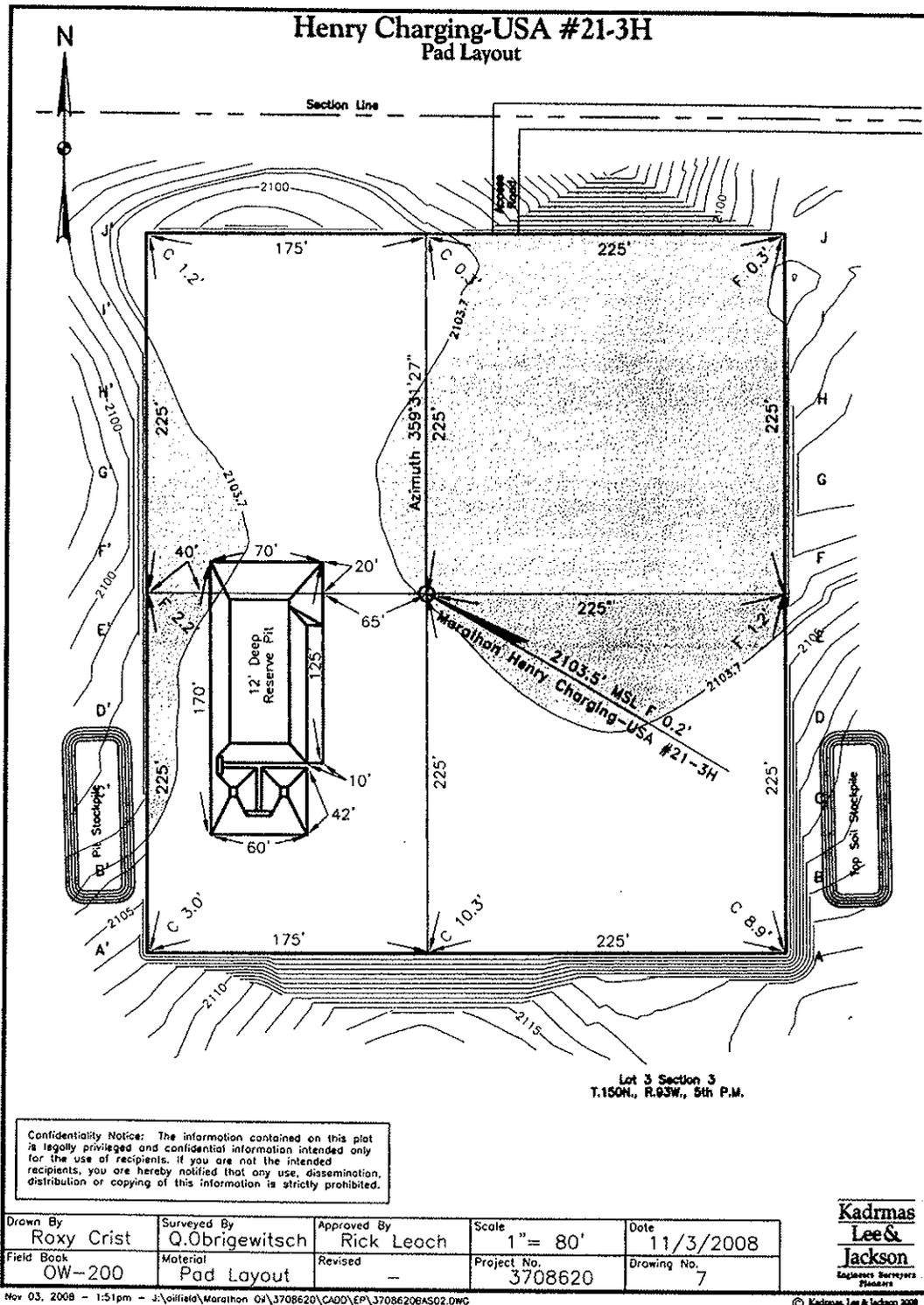


Figure 2.3b: Well Pad Schematic

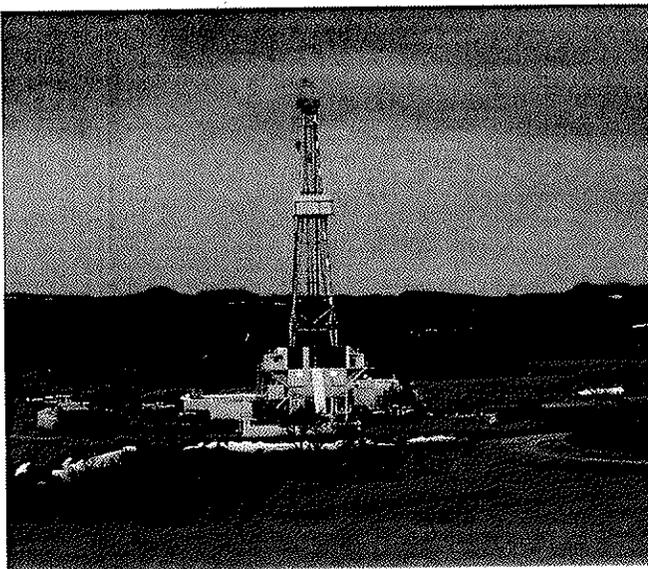
## 2.4 Drilling

After securing mineral leases, Marathon submitted an APD to the BLM on August 26, 2009, proposing to drill the Henry Charging USA 21-3H well in the NE $\frac{1}{4}$ NW $\frac{1}{4}$  of Section 3, T150N, R93W. The BLM North Dakota Field Office forwarded copies of the APD to 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 drilling will begin until an approved permit has been obtained from the BLM.

Initial drilling would be vertical to about 10,225 feet true vertical depth (TVD). The minimum setback of 500 feet (NDCC 43-02-03-18.2) from the north section line and 1220 feet from the west section line would be maintained or achieved through directional drilling, per NDIC regulations and guidelines. Drilling would become roughly horizontal at a measured depth of about 10,950 feet (10,700' TVD), followed by the drilling of a lateral reach of about 9,000 feet in the Middle Bakken Dolomite Member, resulting in a total drill string of about 20,175 feet (10,700 TVD).

Transport of an H&P Flex rig typically used by Marathon and on-site assembly would take about five days. Another 30 days would usually be needed to reach target depth. For the first 2,000 feet, a 13.5 inch diameter hole will be drilled, utilizing a freshwater based mud system with non-hazardous additives, such as bentonite, to minimize contaminant concerns and protect freshwater zones. Water would be obtained from a commercial source for this drilling stage. A 9-5/8" diameter surface casing will be run at least 100' into the Pierre Shale and cemented back to the surface to protect any freshwater zones. After setting and cementing the surface casing, an oil-based mud system (about 80% diesel fuel and 20% water) would be used to drill to the intermediate casing point. Oil-based (invert) drilling fluids can reduce the potential for hole sloughing while drilling through water-sensitive formations, such as shales and salts. About 20,000 gallons of water and 70,000 gallons of diesel fuel would be used in this stage. Oil-based fluids would be recycled both during and after drilling of this well. The lateral reach of the well would be drilled with saltwater-based mud drilling fluid.

All Marathon rigs operating on the reservation are routinely operated as closed systems, in which cuttings, drilling fluids and completion materials are confined to and processed in tanks rather than open pits.



Cuttings generated from drilling will be run through a centrifuge and dryer system and deposited in the reserve pit on each individual well pad. This dryer system allows for better recovery of drilling fluids, less volume of drill cuttings, and therefore allows use of a smaller reserve pit. On the surface, toxic fluids would be contained in steel tanks placed on plastic/vinyl liners, then collected during drilling by centrifuging returns to separate the cuttings from the fluids. Fluids would be recycled back into the steel tanks for re-use. Upon completion of drilling, oil-based fluids are again collected to the extent possible and recycled for use elsewhere. Any free fluids remaining in the reserve pits would be skimmed/recycled or disposed of in approved facilities.

Figure 2.4: Typical drilling rig

## 2.5 Casing and Cementing

Surface casing would be set to about 2,000 feet and cemented back to the surface during drilling, isolating all near-surface freshwater aquifers in the project area. Sand bodies of the Dakota Group are commonly used in North Dakota as a saltwater disposal zone and is expected to be encountered at a depth of about 4,800 feet, so intermediate production casing would be set and cemented from a measured depth about 10,950 feet (10,700 TVD) to 4,600 feet (about 200 feet above any Dakota sand). Casing and cementing operations would be conducted in full compliance with *Onshore Oil and Gas Order 2*, and applicable NDIC regulations.

## 2.6 Completion and Evaluation

After a well has been drilled and cased, a completion (work-over) unit would be moved onto the site. Completion operations are expected to take about 45 days. Due to the low permeability of the targeted Bakken Formation, economically viable production rates are usually achieved by fracturing the subsurface. The typical procedure is to pump a mixture of sand and a carrier (e.g., water) into the horizontal well bore under extremely high pressure. The resulting fractures are propped open by the sand, increasing the capture zone of the well and maximizing efficient drainage of the field. After fracturing, the well is typically flowed back to the surface to recover fracture fluids and remove excess sand. Fluids utilized in the completion procedure would be captured in closed loop tanks for recycling or disposal in strict accordance with NDIC rules and regulations.

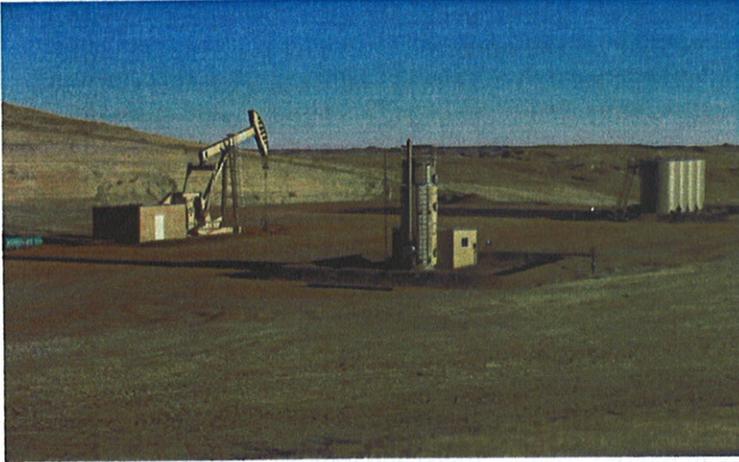
## 2.7 Commercial Production

If drilling, testing and production support commercial production from the proposed location, additional equipment would be installed, including a pumping unit at the well head, a vertical heater/treater, tanks (usually four 400 barrel steel tanks for oil production and one 400 barrel fiberglass tank for saltwater production), and a flare/production pit. An impervious dike sized to hold 100% of the capacity of the largest tank plus one full day's production would surround production tanks and the heater/treater. Load out lines would be located inside the diked area, with a heavy screen-covered drip barrel installed under the outlet. A metal access staircase would protect the dike and support flexible hoses used by tanker trucks. The BIA would choose an inconspicuous paint color for all permanent aboveground production facilities from colors recommended either by the BLM or the Rocky Mountain Five-State Interagency Committee. More detail is included in the APD.

Unless and until both local and regional pipelines are installed, oil would be collected in tanks onsite and periodically trucked to an existing oil terminal for sales. Any produced water would be captured in tanks and periodically trucked to an approved disposal site. The frequency of trucking activities for both product and water would depend upon volumes and rates of production. The duration of production operations cannot be reliably predicted, but some oil wells have pumped for over one hundred years, and best estimates for a typical Bakken Formation well is that the well will have a productive life of thirty years. Gas is generally considered a by-product of oil production, and large volumes of gas are not expected. Gas will initially be flared in accordance with Notice to Lessees (NTL) 4A and NDIC regulations, which prohibit unrestricted flaring for more than the initial year of operation (NDCC 38-08-06-4) without imposition of royalties and possible production restrictions until the well can be hooked up to a gas pipeline. Gas pipeline infrastructure is lacking in this area, but negotiations are underway to bring a gas sales pipeline into the proposed well area, and if economic, the well will be hooked into the pipeline when it is installed.

A single well production facility consists generally of four (4) 400 barrel storage tanks, one fiberglass tank constructed for produced water and three (3) steel constructed crude oil storage tanks. The actual storage capacity will be dependent on well production. The tanks will be complete with necessary truck loading stations. The facility will also include one 6' x 20' vertical heater-treater with energy ratings of 500,000 Btu/hr. The equipment pad would accommodate the gas flaring system, gas sales point, and other

miscellaneous equipment, such as recycling pumps, control and monitoring equipment. All major production equipment will be located on the cut side of the pad.



**Figure 2.7: Typical commercial operation**

Large volumes of gas are not expected from this location. Small volumes would be flared in accordance with Notice to Lessees (NTL) 4A and NDIC regulations, which prohibit unrestricted flaring for more than the initial year of operation (NDCC 38-08-06.4). Results could also encourage additional exploration on the Reservation. Should future oil/gas exploration activities be proposed by Marathon on the Fort Berthold reservation, those proposals and associated federal actions would require additional NEPA analysis and BIA consideration prior to implementation.

## 2.8 Reclamation

The reserve pit and drill cuttings would be treated, stabilized, backfilled and buried as soon as possible after well completion. Water and oil would be removed prior to closure as required by NDIC regulations. Drill cuttings would be stabilized by controlled mixing with fly ash, decreasing the possibility of releases to the environment. 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 would then be buried in the reserve pit, overlain by at least four feet of overburden.

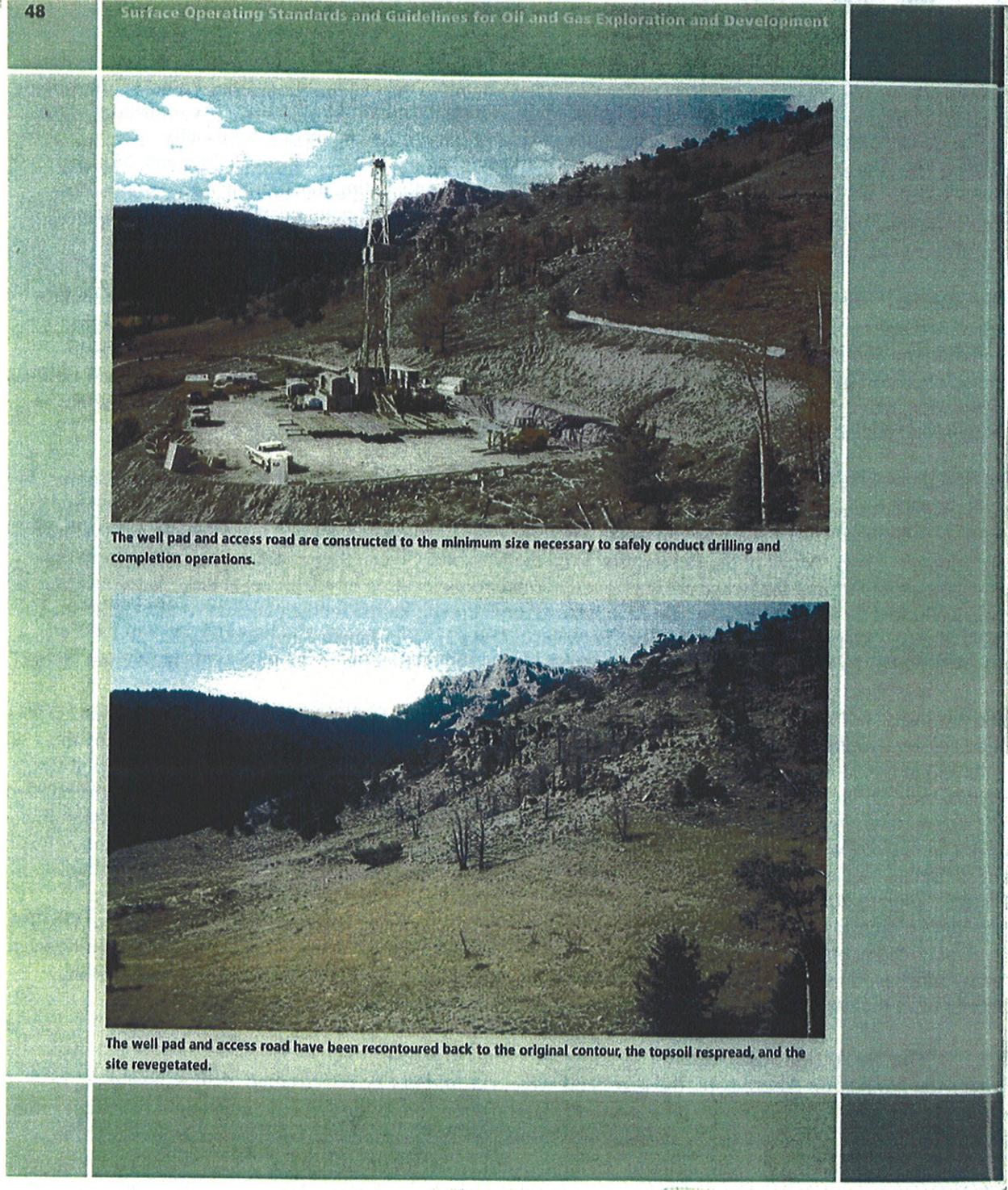
If commercial production equipment is installed, the well pad would be reduced in size, with the rest of the original pad reclaimed. If not already improved, the working area of each well pad and the running surface of access roads would be surfaced with scoria or crushed rock. Outslope portions of roads would 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. Topsoil is spread and the road ditch is reseeded very soon after construction as an erosion control measure. 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. Reseeding would extend reclamation to the edge of the running surface.

Final reclamation would occur either in the very short term if the proposed well is commercially unproductive, or later upon final abandonment of commercial operations. All disturbed areas would be reclaimed, reflecting the BIA view of oil and gas exploration and production as temporary intrusions on the landscape. All facilities would be removed, well bores would be plugged with cement and dry hole markers would be set. Access roads and work areas would be leveled or backfilled as necessary, scarified, 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 owners. The Surface Use Plan in the APD has additional detail regarding both interim and final reclamation measures.

Both during and after construction, soils impacts would be localized, minimized and controlled through use of best management practices. After construction, any disturbed area other than pad working surfaces and road driving surfaces will be prepared for reclamation by re-contouring the area, removing rocks and

replacing stockpiled topsoil. A typical native grass reseeding mix might include western wheatgrass, slender wheatgrass, green needlegrass and side oats grama, with oats as a cover crop for the first year. Final seed mixes will be determined by BIA at the time of reclamation, both initial and final. All seed will be certified weed-free. Figure 2.8 shows an example of reclamation from the Gold Book.

Figure 2.8: Example of reclamation from the Gold Book



## 2.9 Preferred Alternative

The preferred alternative is to complete all administrative actions and approvals necessary to authorize and facilitate oil and gas development at the proposed location.

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

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

The proposed well site and spacing units are in a rural area consisting of grassland (79%) and shrubland (19%) that is currently either idle or used to graze livestock. The landscape has been previously disturbed by dirt trails and graveled and paved roadways. There are no residences within 3,000 feet of the proposed well site. Existing conditions within the proposed drilling units are described below. The broad definition of the human and natural environment under NEPA leads to the consideration of the following elements: air quality, public health and safety, water resources, wetland/riparian habitat, threatened and endangered species, soils, vegetation and invasive species, cultural resources, socioeconomic conditions, and environmental justice. Potential impacts to these elements are analyzed for both the No Action Alternative 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.

### 3.1 The No Action Alternative

Under the No Action Alternative, the proposed project 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, 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. No financial gains would result from resource development. Loss of potential employment and royalty income could impact tribal and individual economies and planning.

### 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 site. Criteria pollutants tracked under National Ambient Air Quality Standards (NAAQS) of the Clean Air Act include sulfur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>10</sub>), nitrogen dioxide (NO<sub>2</sub>) and ozone (O<sub>3</sub>). Two other criteria pollutants – lead (Pb) and carbon monoxide (CO) – are not monitored by any of three stations. Table 3.2 summarizes federal air quality standards and available air quality data from the three-county study area.

Table 3.2: Air quality standards and data for Dunn, McKenzie, and Mercer Counties, North Dakota

Pollutant	Averaging Period	NAAQS ( $\mu\text{g}/\text{m}^3$ )	NAAQS (ppm)	County		
				Dunn	McKenzie	Mercer
SO <sub>2</sub>	24-Hour	365	0.14	0.004 ppm	0.004 ppm	0.011 ppm
	Annual Mean	80	0.030	0.001 ppm	0.001 ppm	0.002 ppm
PM <sub>10</sub>	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 <sub>2.5</sub>	24-Hour	35	--	--	--	--
	Weighted Annual Mean	15	--	--	--	--
NO <sub>2</sub>	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 <sub>3</sub>	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

Source: U.S. Environmental Protection Agency (EPA) 2006.  $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter. ppm = parts per million.

North Dakota was one of only 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 3.2 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, which covers about 110 square miles in three units within the Little Missouri National Grassland between Medora and Watford City, 30-40 miles west of the proposed well site. The Reservation can be considered a Class II attainment airshed, which affords it a lower level of protection from significant deterioration.

The proposed project is similar to other projects installed nearby with the approval of state offices. Construction, drilling and tanker traffic would generate temporary, intermittent and nearly undetectable gaseous emissions of particulates, SO<sub>2</sub>, NO<sub>2</sub>, CO, and volatile organic compounds. Road dust would be controlled as necessary and other best management practices implemented as necessary to limit emissions to the immediate project area (BLM 2005). No detectable or long-term impacts to air quality or visibility are expected within the airsheds of the Reservation, state, or Theodore Roosevelt National Park. 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. No residences were identified within 3,000 feet of the proposed site.

Hydrogen sulfide gas (H<sub>2</sub>S) is extremely toxic in concentrations above 500 parts per million, but it has not been found in measurable quantities in the Bakken Formation. Before reaching the Bakken, however, drilling would penetrate the Mission Canyon Formation, which is known to contain varying concentrations of H<sub>2</sub>S. Release of H<sub>2</sub>S 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 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. No homes are within ½ mile of the proposed well pad and all are typically downwind from the pad, according to 2006 data from the AAQM site at the Dunn Center monitoring site (NDDH 2007). No direct impacts from H<sub>2</sub>S are anticipated.

Negative impacts from construction would be largely temporary. Noise, fugitive dust, and traffic hazards would be present for about sixty days during construction, drilling and well completion, after which they would then diminish sharply during commercial operations. For this proposed well site it is anticipated that about 50 trips, over the course of several days, would be required to transport the drilling rig and associated equipment to the site, with the same traffic later needed to remove the rig and other temporary facilities.

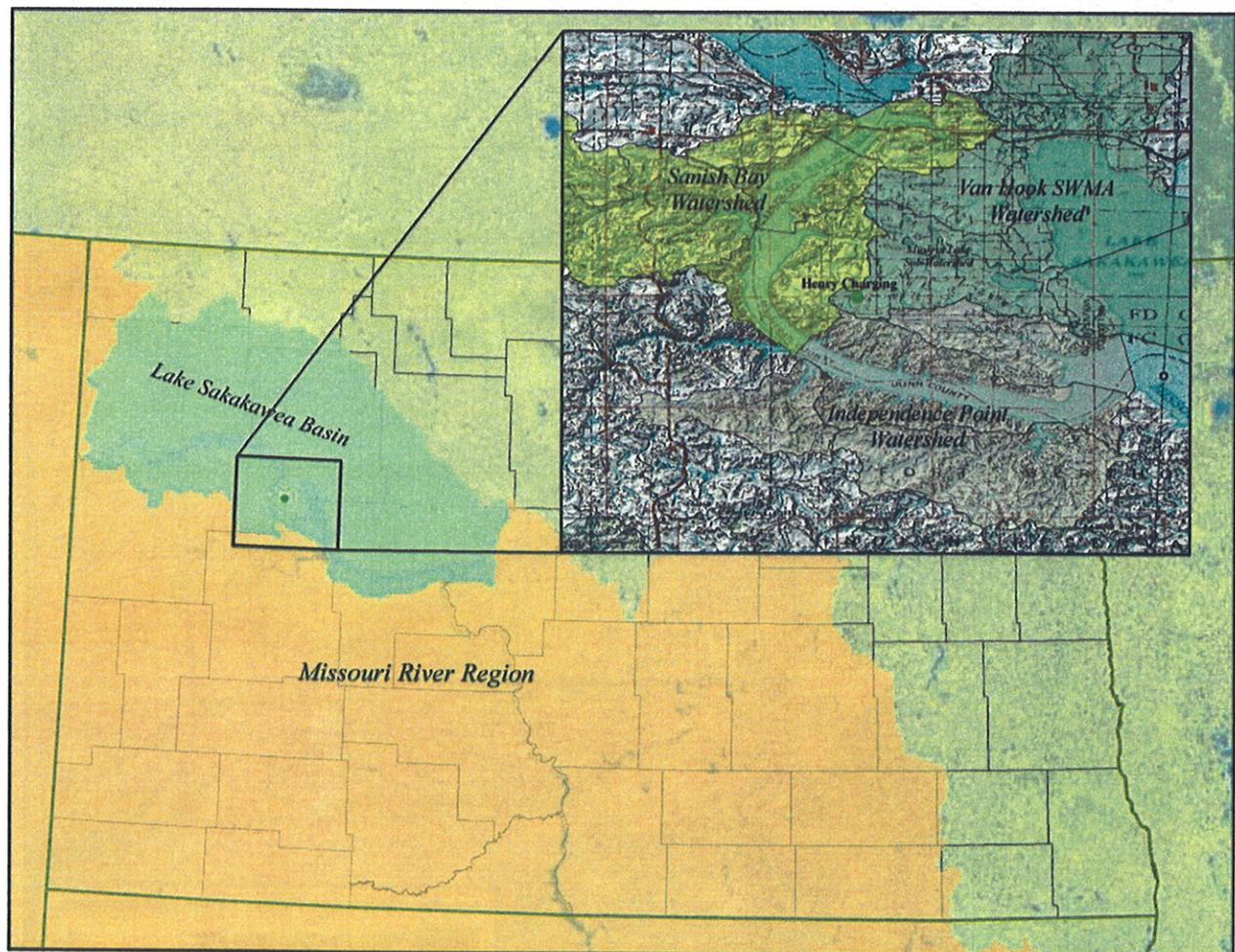
If the well proves productive, one small truck would travel to the pad each day to check the pump. Gas would be flared initially, while oil and produced water would be hauled out by tankers, with tanker traffic depending directly on productivity. A successful Bakken Formation well usually produces both oil and water at a high rate initially. In the vicinity of the proposed project, 500-1,000 barrels of oil per day might be expected at first, along with about 200 barrels of water. Over the next several months, daily production might drop to 200-400 barrels of oil and 30-70 barrels of water. An oil tanker can usually haul 140 barrels of oil per load, while water tankers usually hold 110 barrels. Production service might then start at 3-7 oil tankers and two water haulers in and out daily, before declining to 2-3 oil tankers and a single water load. Established load restrictions for state and BIA roadways would be followed and haul permits would be acquired as appropriate. All traffic must be confined to approved routes and conform to speed limits.

The U.S. EPA specifies chemical reporting requirements under Title III of the *Superfund Amendments and Reauthorization Act* (SARA) of 1986, as amended. No materials used or generated by this project 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 or traffic. All operations, including flaring, would conform to instructions from BIA fire management staff. Impacts from the proposed project are considered minimal, unlikely and insignificant. No laws, regulations or other requirements have been waived; no compensatory mitigation measures are required.

### 3.4 Water Resources

#### Surface Water

The project would be located in the Lake Sakakawea Basin. The proposed site is located in the Van Hook SWMA watershed and the Muskrat Lake sub-watershed. Watersheds are shown in Figure 3.4a.



**Figure 3.4a: Watershed map**

Runoff is initially by sheet flow, until collected by ephemeral and perennial streams draining to Lake Sakakawea. Runoff from the well pad would flow 0.2 miles north to an unnamed tributary and then 6.7 miles northeast to Muskrat Lake. From there it would travel 1.7 miles southeast to Lake Sakakawea. Please refer to Figure 3.4b, Landscape Drainage. The section line road to the access road would cross several small draws. Runoff through these draws would also flow north to an unnamed tributary and follow a similar route to Lake Sakakawea.

The proposed project has been sited to avoid direct impacts to surface water and minimize disruption of drainages. Roadway engineering and erosion control measures would mitigate the potential migration of sediments downhill or downstream. No measurable increases in runoff or impact to surface waters are expected.



Figure 3.4b Landscape Drainage

#### Groundwater

From deepest to shallowest, regional aquifers include the Cretaceous Fox Hills and Hell Creek Formations and the Tertiary Tongue River and Sentinel Butte Formations, as shown in Table 3.4a. The

Sentinel Butte formation frequently crops out and is most commonly used for domestic supply; its water is potable and meets the standards of the North Dakota Department of Health. Detailed analyses are available from the North Dakota Geological Survey, Bulletin 68, Part II, 1976.

**Table 3.4a: Aquifers**

Formation Name	Depth Range (ft)	Thickness (ft)	Lithology
Sentinel Butte	0 – 300	Up to 500	Siltstone and sandstone
Tongue River	0 – 500	Up to 500	Siltstone and sandstone
Hell Creek	900 – 1900	300	Sandstone and shale
Fox Hills	1200 – 2200	200	Sandstone and shale

Review of the electronic records of the North Dakota State Water Commission revealed no active permitted water wells or surface water impoundments within the vicinity of the proposed site. No documented wells were noted within one mile of the Henry Charging site. Information regarding water permits in other sections of the proposed well site townships are summarized in Table 3.4b and illustrated in Figure 3.4c.

**Table 3.4b: Nearby water wells**

Location	Distance to Well Pad (miles)	Permit Type	Permit Information		
			Aquifer	Depth (feet)	Date
SE¼NE¼, Sec.31, T150N R93W	5.9	Unknown	Sentinel Butte-Tongue River	336	1961
NE¼SW¼, Sec.33, T150N R93W	5.6	Unknown	Sentinel Butte-Tongue River	388	1960

Source: North Dakota State Water Commission, July 2008 ([www.swc.state.nd.us](http://www.swc.state.nd.us))

Drilling would proceed in compliance with *Onshore Oil and Gas Order 2, Drilling Operations* (43 CFR 3160). A cement bond log would be run on the well, allowing BLM to ascertain if remedial cementing must be installed for a proper seal between casing and strata. Seepage and infiltration of hazardous materials is considered unlikely. Tanks would be employed to capture cuttings and fluids in a closed-loop system. Other than the reserve for disposal of the dried cuttings, there would be no other pits or lagoons. Impacts to shallow aquifers from surface activities and spills would be avoided or managed by implementation of a Spill Prevention, Control, and Countermeasure (SPCC) Plan.

Freshwater drilling fluids would be used to a point below the Fox Hills Formation. Produced water would be captured in tanks on-site and periodically trucked to an approved disposal site. BIA and BLM would monitor all operations and review all records at their discretion. Evidence of groundwater contamination related to the project would result in a stop-work order until all appropriate measures were identified and implemented. These and other construction and reclamation techniques included in the APD would minimize potential for impacts to either surface water or groundwater. All perennial water bodies are distant. No significant impacts to surface water or groundwater are expected as a result of the proposed action. No applicable laws or regulations would be waived; no compensatory mitigation measures are required to protect surface water or groundwater.

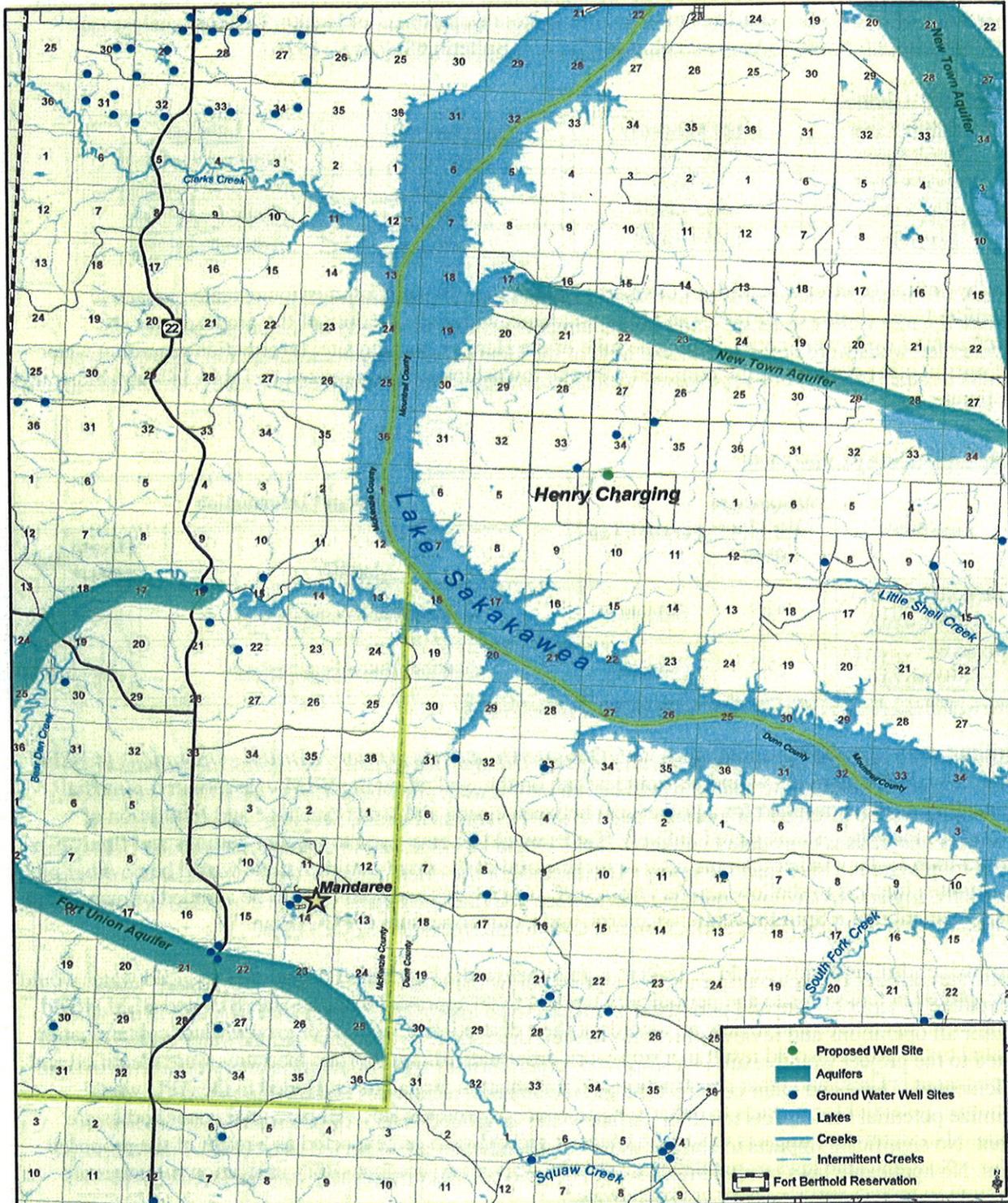


Figure 3.4c: Water resources

### 3.5 Wetland/Riparian Habitat and Threatened or Endangered Species

National Wetland Inventory (NWI) maps maintained by the U.S. Fish and Wildlife Service (USFWS) do not identify any wetlands within the proposed area of disturbance. An on-site assessment with representatives from the BIA, BLM, Three Affiliated Tribes Game and Fish Department, Three Affiliated

Tribes Tribal Historic Preservation Office, Marathon, and Kadrmas, Lee & Jackson was conducted on January 7, 2009. A follow-up site visit was conducted on April 28, 2009 by the BIA Environmental Protection Specialist, Marathon, and Kadrmas, Lee & Jackson. The follow-up site visit was performed as seasonal weather conditions during the initial on-site were not favorable to adequately assess resources. The on-site and follow-up visit confirmed that riparian or wetland habitats would not be impacted by the proposed road or well at this location.

Species may be listed by the USFWS as threatened or endangered under the *Endangered Species Act*. Tribes and states may recognize additional species of concern; such lists are taken under advisement by federal agencies, but are not legally binding in the manner of the Endangered Species Act. More information on the status, life history, and habitat requirements for these species may be found online at: [www.fws.gov/northdakotafieldoffice/endspecies](http://www.fws.gov/northdakotafieldoffice/endspecies). The following species are listed or proposed by the USFWS or are of special concern to the BIA.

**Bald eagle** (*Haliaeetus leucocephalus*)      Status: de-listed in 2007      Likelihood of occurrence:  
**unlikely**

Bald eagles are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Despite de-listing, bald eagles are treated as a species of concern within both the Department of the Interior and the BIA. The project area does not contain suitable roosting/perching habitat, concentrated feeding areas, or other special habitat. No impacts are expected.

**Golden eagle** (*Aquila chrysaetos*)      Status: unlisted      Likelihood of occurrence:  
**unlikely**

Golden eagles are protected under the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and as a species of special concern within both the Department of the Interior and the BIA. Less riverine in their habits than bald eagles, golden eagles favor open prairie, plains, and forested areas. Soaring areas are within one mile of badlands cliffs, where the birds are vulnerable to transmission lines. The project area does not contain suitable soaring or roosting habitat, concentrated feeding areas, or other special habitat. No impacts are expected.

**Black-footed ferret** (*Mustela nigripes*)      Status: endangered      Likelihood of occurrence:  
**unlikely**

The presence of black-footed ferrets has not been confirmed in North Dakota for over 20 years and the species is presumed extirpated. Impacts are not expected.

**Dakota skipper** (*Hesperia dacotae*)      Status: candidate      Likelihood of occurrence:  
**unlikely**

There are no undisturbed native prairie areas with a high diversity of wildflowers and grasses within the proposed project area. The lack of well-suited habitat makes the presence of Dakota skippers unlikely. No impacts are expected.

**Gray wolf** (*Canis lupus*)      Status: endangered      Likelihood of occurrence:  
**unlikely**

The proposed development area does not contain preferred habitat or suitable prey to sustain a permanent gray wolf population. It is highly unlikely wolves would colonize or transit the project area given poor habitat, unreliable food supplies, nearby human habitation, and the distance to known wolf populations in Minnesota, Canada, Montana, and Wyoming. No impacts are expected.

**Interior least tern** (*Sterna anillarum*)      Status: endangered      Likelihood of occurrence: **rare**

The proposed project is in an upland area that is well away from the preferred nesting habitat of sparsely vegetated sandbars along rivers, sand and gravel pits, and lake or reservoir shorelines. The nearest

nesting/foraging habitat is along Lake Sakakawea, at least 3.0 miles from the Henry Charging site. There are no suitable nesting/foraging habitats located within the proposed drilling unit. No impacts are expected.

**Pallid sturgeon** (*Scaphirhynchus albus*) Status: threatened Likelihood of occurrence:  
**unlikely**

In North Dakota, the pallid sturgeon is found principally in the Missouri River and upstream of Lake Sakakawea in the Yellowstone River. The proposed project area is 3.0 miles from the river. Project activities are not expected to affect water quality or flows in the river. No impacts are expected.

**Piping plover** (*Charadrius melodus*) Status: threatened Likelihood of occurrence:  
**unlikely**

Piping plovers nest on sparsely vegetated shoreline beaches, peninsulas, and riverine sandbars and islands composed of sand, gravel, or shale. The USFWS has designated critical habitat on the Missouri River system, including the entire shoreline of Lake Sakakawea, which is at least 3.0 miles from the proposed project area. There are no suitable nesting/foraging habitats located within the upland setting of the proposed project. No impacts are expected.

**Whooping crane** (*Grus Americana*) Status: endangered Likelihood of occurrence:  
**unlikely**

Whooping cranes migrate through North Dakota along a band running from the south-central to the northwest parts of the state. They use shallow, seasonally and semi-permanently flooded wetlands for roosting and various cropland and emergent wetlands for feeding. The lack of food sources and roosting/foraging habitat in the project area makes stopovers by migrating cranes unlikely. No impacts are expected.

Potential impacts to wildlife include construction of the well pad and access road, and potential future commercial operations. Fragmentation of native prairie habitat is a specific concern for grouse species, but the limited disturbance from exploration remains small in the landscape context. The well location has been sited to take advantage of pre-existing disturbances, minimizing impacts. Site visits to the proposed location determined that no critical or unique habitats would be impacted. Precautions benefitting wildlife include 1) use of a closed-loop system to manage cuttings and fluids on site; 2) netting of the reserve pit during the period between drilling and reclamation of the pit; 3) prevention or removal of oil from open pits; and 4) installation of covers on drip buckets under valves and spigots. Reclamation of disturbed areas over the life of the project would further reduce long-term impacts to all wildlife. No impacts are expected to listed or special species, due the sparseness of even anecdotal evidence that they occur within the project area.

Small game species were not observed during the on-site survey, but they may use the area for food, habitat, breeding or migration. The area contains suitable food sources for sharptail grouse, ringneck pheasant, and mourning dove. The project area is located within waterfowl and songbird migratory routes. A variety of nongame wildlife might occupy or traverse the project area, including song birds, coyote, red fox, North American badger, cottontail rabbit, and white-tailed jackrabbit. Resident or transient birds observed during the on-site survey included red-winged blackbird, Hungarian partridge, and western meadowlark. No sharptail grouse and sage grouse leks were observed in the agricultural fields and no native prairie would be disturbed. No other non-game wildlife was observed. Many other species may use or traverse the area, but wildlife is generally expected to adapt to changing conditions and continue to thrive. The proposed project is expected to have no measurable effect on listed or other wildlife.

### 3.6 Soils

In the area of this proposed development the near surface sediments consist of up to 100 feet of Quaternary-aged glacially-derived sandy sediments of the Coleharbor Group. These sediments are generally underlain by deposits derived primarily from fluvial-derived sandstones, siltstones and claystones of the early Tertiary Sentinel Butte and Bullion Creek Formations.. A soil survey for Mountrail County was published in 1991, with the most current information available online from the Natural Resources Conservation Service (NRCS 2008). Table 3.6a identifies soils and key attributes and indicates which soils occur in the proposed road or well pad area.

**Table 3.6a**

Soil	Project Occurrence	Composition (0-60" bgs)			Erosion and Runoff Factors			
	Henry Charging	% sand	% silt	% clay	Slope	Kf Factor	T Factor	Hydrologic Soil Group
Williams-Zahl loams – 24C	R	35	35	30	6 – 9	.28	5	B
Zahl-Williams loams – 24E	WP/R	35	34	31	9 – 25	.28	5	B
Zahl-Max loams – 24F	WP/R	35	34	31	25 – 60	.28	5	B

Source: NRCS 2008. bgs = Below Ground Surface WP = Well Pad R = Access Road

**Erosion factors** indicate susceptibility of soils to erosion by wind or water:

- **Slope** is indicated as an average or typical gradient under which soils form.
- **Kf** indicates erodibility of material less than 2 millimeters in size to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Higher values indicate greater erosion potential.
- **T** estimates maximum average annual rates of erosion by wind and water that will not affect crop productivity. Tons per acre per year values range from 1 for shallow soils to 5 for very deep soils. Higher T soils can tolerate higher rates of erosion without loss of productivity.

**Hydrologic Soil Groups** (A, B, C, D) are assigned from estimates of runoff potential, based on infiltration rates of wetted soils unprotected by vegetation during long-duration storms. The rate of infiltration decreases from Group A soils (high infiltration, low runoff) to Group D soils (low infiltration, high runoff).

Well pad and access road construction would take place predominantly on Zahl-Williams loams. These soils are deep, well drained upland soils with moderately slow permeability and moderate runoff rates. Zahl-Williams loams have low potential for water and wind erosion. The remaining construction would take place on soils of a similar nature and are not anticipated to pose erosion concerns. Both the well pad and new access road would be constructed on moderately flat to slightly sloped terrain with slopes varying between two and seven percent.

Soil erosion rates have been extensively studied. Erosion potential is greatest in the interval between construction and reclamation, as stabilizing vegetation is removed and topsoil stripped, with vulnerability increasing with slope. Various practices have been shown, however, to feasibly and significantly reduce erosion of a wide variety of soils, including those typical of the project area (BLM Instruction Memorandum 2004-124, BLM/USFS Gold Book, BLM 1997, BLM 2003, Grah 1997). Compliance with best management practices outlined in these guidance materials regarding construction, stabilization and reclamation is expected to reduce erosion to negligible or acceptable levels.

### 3.7 Vegetation and Invasive Species

The proposed project is located within the Missouri Plateau Eco-region (Missouri Slope), a western mixed-grass/short-grass prairie. The U.S. Department of Agriculture Soil Survey for Mountrail County describes vegetation within the proposed project area as predominantly cultivated with areas of rangeland and pastureland. Grain and seed crops common to the project area include cultivars of durum wheat, spring wheat, barley, sunflower, oats, safflower, flax, and hay. The cumulative list of grasses and forbs identified during the follow-up site assessments conducted with the BIA Environmental Protection Specialist, Kadmas, Lee & Jackson, and Marathon on April 28, 2009 and June 3, 2009 includes: smooth brome (*Bromus inermis*), purple coneflower (*Echinacea angustifolia*), Western wheatgrass (*Agropyron*

*smithii*), Kentucky bluegrass (*Poa pratensis*), and dandelion (*Taraxacum officinale*). The proposed site was used for hay or pastureland. Chokecherry (*Prunus virginiana*), prairie rose (*Rosa arkansa*), and Western snowberry (*Symphoricarpos occidentalis*) were observed within the boundaries of the proposed well pad site. No riparian or wetland vegetation was present within the area of effect of the proposed well site or access road.

*Invasive species* is a general term referring to plants that are not native to an area, which spread aggressively, and have undesirable economic and environmental impacts. Otherwise known as noxious weeds, these species can easily spread to the detriment of public health, indigenous plant communities, crops, grazing and recreation areas, and the management of natural or agricultural systems. Of the 12 species declared noxious under North Dakota Century Code (Chapter 63-01.1), seven are known to occur in Mountrail County. Table 3.7 identifies these species and quantifies infestations. Counties and cities have the option to add species to be regulated within their jurisdiction. Mountrail County has added common tansy, yellow toadflax, and houndstongue to its control list.

**Table 3.7: Invasive species**

Common Name	Scientific Name	Mountrail County Acres
Absinth wormwood	<i>Artemisia absinthium</i> L.	1,200
Canada thistle	<i>Cirsium arvense</i> (L.) Scop	20,100
Dalmation toadflax	<i>Linaria genistifolia</i> ssp.	--
Diffuse knapweed	<i>Centaurea diffusa</i> Lam	--
Field bindweed	<i>Convolvulus arvensis</i> L.	900
Leafy spurge	<i>Euphorbia esula</i> L.	12,300
Musk thistle	<i>Carduus nutans</i> L.	2
Purple loosestrife	<i>Lythrum salicaria</i>	--
Russian knapweed	<i>Acroptilon repens</i> (L) DC.	--
Salt cedar (tamarisk)	<i>Tamarix ramosissima</i>	1,100
Spotted knapweed	<i>Centaurea maculosa</i> Lam.	300
Yellow starthistle	<i>Centaurea solstitialis</i> L.	--

Source: NRCS Plants Database for North Dakota at <http://plants.usda.gov>.

Careless construction and transportation practices could introduce undesirable species to the project area during disturbance and the removal of existing vegetation. Infestations could spread to neighboring tracts; causing reductions in the quality or quantity of forage or crop production. Although no noxious weeds were observed during the on-site assessments, the APD and this EA require the developer to control invasive species within the project area. Surface disturbance and vehicular traffic must not take place outside approved rights-of-way or the well pads. Certified weed-free straw and seed must be used for all construction, seeding, and reclamation events. Vehicles driven in areas with invasive species must be cleaned with high-pressure washers before entering areas addressed in this EA. These requirements and prompt reclamation (both initial and final) are expected to minimize the introduction and spread of 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.

A cultural resource inventory of this well pad and access road was conducted by personnel of Earthworks [Kadmas, Lee and Jackson, Inc.], using a pedestrian methodology. Approximately 27 acres were intensively inventoried on November 17, 2008 (Ó Donnchadha 2009). No historic properties were located within the project area 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. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (16 USC 1996). As the lead federal agency, and as provided for in 36 CFR 800.5, on the basis of the information provided, BIA reached a determination of **no historic properties affected** for this undertaking. This determination was communicated to the THPO on January 27, 2009; no response was received from the THPO within the allotted 30-day comment period (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
<b>Existing Housing</b>					
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
<b>Housing Development Statistics</b>					
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.

### **3.11 Mitigation and Monitoring**

Many protective measures and procedures are described in this document and in the APD. No laws, regulations, or other requirements have been waived; no compensatory mitigation measures are required. Monitoring of cultural resource impacts by qualified personnel is recommended during all ground-disturbing activities.

### **3.12 Irreversible and Irretrievable Commitment of Resources**

Removal and consumption of oil and/or gas from the Bakken Formation would be an irreversible and irretrievable commitment of resources. Other potential resource commitments include 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.

### **3.13 Short-Term Use Versus Long-Term Productivity**

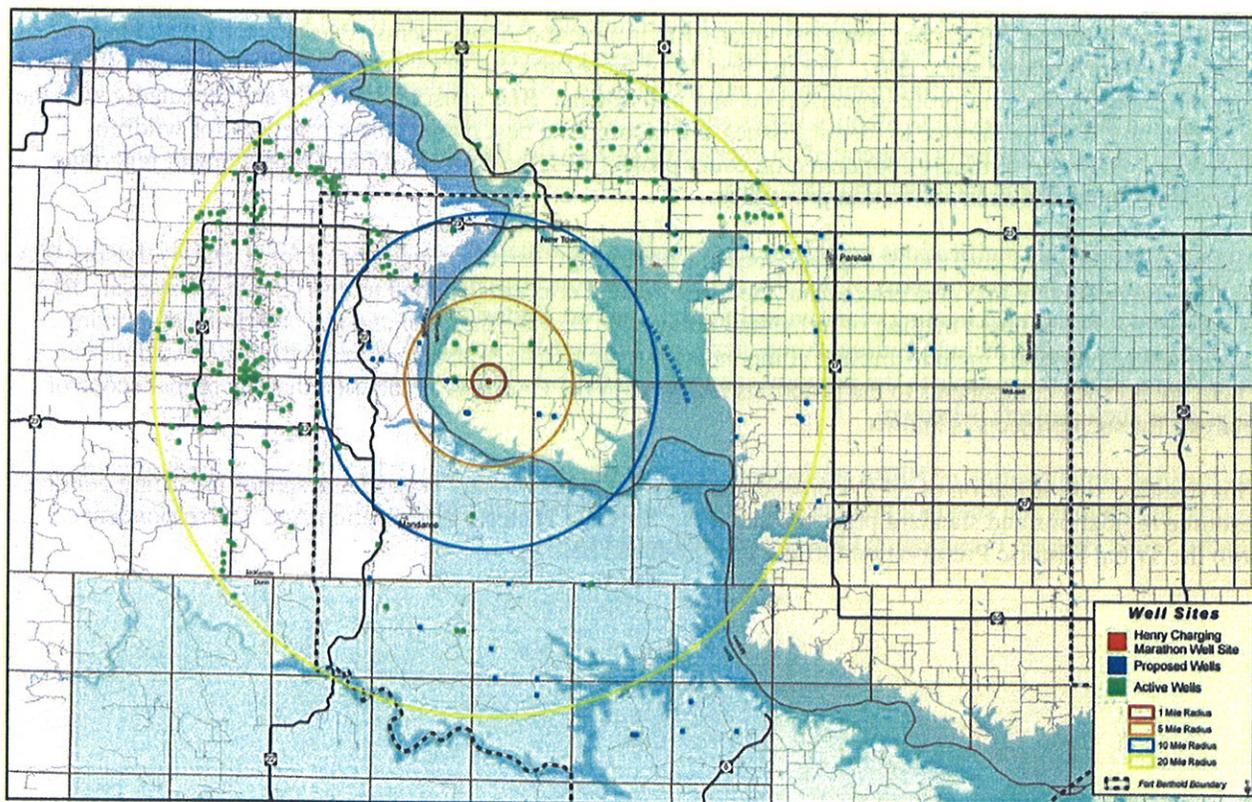
Short-term activities would not detract significantly from long-term productivity of the project area. The small areas dedicated to the access road and well pad would be unavailable for livestock grazing, wildlife habitat and other uses. Allottees with surface rights would be compensated for loss of productive acreage and the project footprint would shrink considerably once the well were drilled and non-working areas were reclaimed and reseeded. Successful and ongoing reclamation of the landscape would 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.

### **3.14 Cumulative Impacts**

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 project 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.

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 site were therefore evaluated to determine the level of oil and gas activity in the surrounding area, as shown in Figure 3.14. There is one additional well currently proposed within one mile of the site considered in this document. Within 20 miles of the proposed well site, there are 218 active wells. As shown in the figure below, 207 of these are located outside the Reservation borders. Previous oil and gas exploration within the Reservation has resulted in a number of abandoned and dry wells, but more recent efforts have been more successful. The distance from the proposed site to the nearest proposed or installed oil/gas well is 2.0 miles.



**Figure 3.14: Approved or Proposed Oil and Gas Projects**

Within the reservation and near the proposed site, installations remain few and dispersed. The project proposed in this EA would not share roads with any other installation. Commercial success at any new well might result in additional oil/gas exploration proposals, but such developments are speculative at this time and until APDs are submitted to BLM or BIA. Approved oil/gas leases may lead to additional exploration and development, but additional analysis and BIA approval are 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.

The proposed action has been planned to avoid impacts to wetlands, floodplains, surface water, cultural resources, and threatened and endangered species. Unavoidable impacts to these or other resources would be minimized and/or mitigated as described in this document. The operator of any facility would be required to complete interim reclamation of the road and well pad immediately following construction and completion. Implementation of other precautionary and protective measures detailed in this EA, the APD, and applicable regulations are expected to minimize impacts to all critical elements of the human environment. Impacts from the proposed project are generally expected to be minor, temporary, manageable, and/or insignificant. No cumulative impacts are reasonably foreseen from existing and proposed activities, other than increasingly positive impacts to the reservation economy.

## **4. Consultation and Coordination**

The Bureau of Indian Affairs has completed many Environmental Assessments (EAs) for the 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 proposals include unusual components not previously considered with other interested parties. There are no such components to the proposals analyzed in the EA. BIA is satisfied that the proper scope of analysis for such projects is known.

This 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



IN REPLY REFER TO:  
DESCRM  
MC-208

JAN 23 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 six oil well pads and access roads in Mountrail County, North Dakota. Approximately 104.7 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 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 these undertakings. Catalogued as **BIA Case Number AAO-1601/FB/09**, the proposed undertakings, locations, and project dimensions are described in the following reports:

Morrison, John G.

- (2009) Gladys USA 21-2H Well Pad and Access Road: A Class III Cultural Resource Inventory, Mountrail County, North Dakota. Earthworks for Marathon Oil, Dickinson, ND.
- (2009) Howard USA 11-1H Well Pad and Access Road: A Class III Cultural Resource Inventory, Mountrail County, North Dakota. Earthworks for Marathon Oil, Dickinson, ND.
- (2009) Raymond USA 41-4H Well Pad and Access Road: A Class III Cultural Resource Inventory, Mountrail County, North Dakota. Earthworks for Marathon Oil, Dickinson, ND.

Ó Donnchadha, Brian

- (2009) Arvid Bangen USA 31-18H Well Pad and Access Road: A Class III Cultural Resource Inventory in Mountrail County, North Dakota. Earthworks, Inc. for Marathon Oil Company, Dickinson, ND.
- (2009) Everett Fisher USA 41-6H Well Pad and Access Road: A Class III Cultural Resource Inventory in Mountrail County, North Dakota. Earthworks, Inc. for Marathon Oil Company, Dickinson, ND.
- (2009) Henry Charging USA 21-3H Well Pad and Access Road: A Class III Cultural Resource Inventory in Mountrail County, North Dakota. Earthworks, Inc. for Marathon Oil Company, Dickinson, ND.

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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

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bcc: Subject/Reading file

## 5. 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 Kadrmas, Lee and Jackson under contract to Marathon Oil Company under the direction of BIA. Preparers, reviewers, consultants and federal officials include the following:

- Bureau of Indian Affairs      Division of Environmental, Safety and Cultural Resource Management  
  
Darryl Turcotte, Natural Resource Officer, Fort Berthold Agency. On-site assessment team leader.
- Marathon Oil Company      Luke Franklin, Senior Environmental Professional.  
Darrell Nodland, Operations Specialist
- Kadrmas, Lee and Jackson      Shanna Braun  
Grady Wolf  
Jerry Reinisch  
Skipp Tatum  
Bill Sues  
Charlotte Brett

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## Acronyms

<b>AAQM</b>	Ambient Air Quality Monitoring (site)	<b>NDNH</b>	North Dakota Natural Heritage
<b>AIRFA</b>	American Indian Religious Freedom Act	<b>ND SWC</b>	North Dakota State Water Commission
<b>APD</b>	Application for Permit to Drill	<b>NEPA</b>	National Environmental Policy Act
<b>APE</b>	Area of Potential Affect	<b>NHPA</b>	National Historic Preservation Act
<b>BIA</b>	Bureau of Indian Affairs	<b>NPAL</b>	Northern Plains Agroecosystems Laboratory
<b>BLM</b>	Bureau of Land Management	<b>NRCS</b>	Natural Resources Conservation Service
<b>CFR</b>	Code of Federal Regulations	<b>NRHP</b>	National Register of Historic Places
<b>EA</b>	Environmental Assessment	<b>NTL</b>	Notice to Lessees
<b>EIS</b>	Environmental Impact Statement	<b>SHPO</b>	State Historic Preservation Officer
<b>EPA</b>	Environmental Protection Agency	<b>TCP</b>	Traditional Cultural Property
<b>FONSI</b>	Finding of No Significant Impact	<b>TERO</b>	Tribal Employment Rights Office
<b>GPRO</b>	Great Plains Regional Office	<b>THPO</b>	Tribal Historic Preservation Officer
<b>MHA Nation</b>	Three Affiliated Tribes of the Mandan, Hidatsa and Arikira Nation	<b>TVD</b>	Total Vertical Depth
<b>NAGPRA</b>	Native American Graves Protection and Repatriation Act	<b>USC</b>	United States Code
<b>NDCC</b>	North Dakota Century Code	<b>USFS</b>	U.S. Forest Service
<b>NDDH</b>	North Dakota Department of Health	<b>USFWS</b>	U.S. Fish and Wildlife Service
<b>NDIC</b>	North Dakota Industrial Commission	<b>USGS</b>	U.S. Geological Survey

# **Notice of Availability and Appeal Rights**

Marathon: Henry Charging-USA #21-3H

**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 Marathon 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 29, 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.

