

ENVIRONMENTAL ASSESSMENT

United States Bureau of Indian Affairs

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



Questar Exploration and Production

Four Bakken Formation Exploratory Wells at Four Locations:

**MHA #1-06H-149-91
MHA #1-01H-149-92
MHA #1-31H-150-91
MHA #1-06-31H-150-92**

Fort Berthold Indian Reservation

September 2009

For information contact:
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United States Department of the Interior

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IN REPLY REFER TO:
DESCRM
MC-208

OCT 09 2009

MEMORANDUM

TO: Superintendent, Fort Berthold Agency

FROM: ^{ACTING} Regional Director, Great Plains Region 

SUBJECT: Environmental Assessment and Finding of No Significant Impact

In compliance with the regulations of the National Environmental Policy Act (NEPA) of 1969, as amended, for four proposed exploratory drilling wells by Questar on *MHA#1-06H-149-91*, *MHA#1-01H-149-92*, *MHA-1-31H-150-91* and *MHA-1-06-31H-150-92* on the Fort Berthold Reservation, an Environmental Assessment (EA) has been completed and a Finding of No Significant Impact (FONSI) has been issued.

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

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

Attachment

cc: Marcus Levings, Chairman, Three Affiliated Tribes (with attachment)

Finding of No Significant Impact

Questar Exploration and Production

MHA #1-01H-149-92
MHA #1-06H-149-91
MHA #1-31H-150-91
MHA #1-06-31H-150-92

Fort Berthold Indian Reservation Dunn 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 6: T150N-R92W, Section 12: T149N-R92W, Section 6: T149N-R91W and Section 1: T150N-R91W. Associated federal actions by BIA include determinations of effect regarding cultural resources, approvals of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Applications for Permit to Drill.

Potential of the proposed actions to impact the human environment is analyzed in the attached 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.


ACTING Regional Director

10-9-09
Date

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1. Purpose and Need for the Proposed Action

Questar is proposing to drill four horizontal oil/gas wells from four locations on the Fort Berthold Indian Reservation to evaluate and potentially develop the commercial potential of natural resources. Developments have been proposed on lands held in trust by the United States in Dunn County, North Dakota. The 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. One well would be drilled from each surface location shown in Figure 1. MHA 1-06-31H-150-92: SESW of Section 6: T150N-R92W, MHA 1-01H-149-92: NWNE of Section 12: T149N-R92W, MHA 1-06H-149-91: SESE of Section 6: T149N-R91W, MHA 1-31H-150-91: SESE of Section 1: T150N-R91W, all in 5th PM, Dunn County, North Dakota.

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 Questar describe 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 applications 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 would be constructed to accommodate drilling operations. Pits for drill cuttings would be constructed, used and reclaimed. Drilling and completion information could result in long-term commercial production at some or all of the sites, in which case supporting facilities would be installed. The working portions of well pads and the access roads would remain in place during commercial production. All project components would 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 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 wells 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.

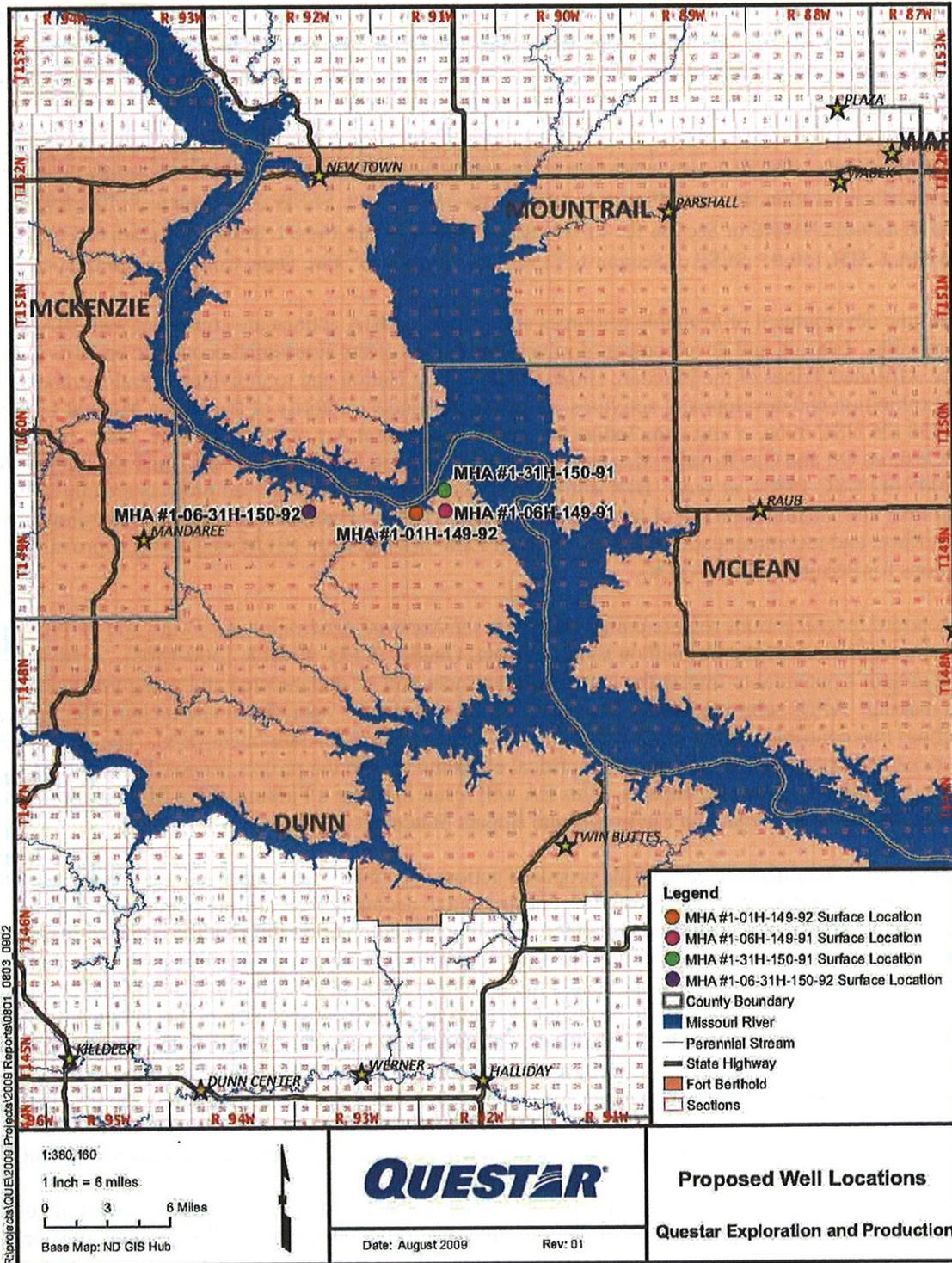


Figure 1: Project locations.

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 leases, rights-of-way or other administrative proposals for one or more of the proposed projects. Applications for Permit to Drill (APDs) for at least one of the listed well locations would not be approved. Current land use practices would continue at No Action sites. Development under other oil and gas leases would remain a possibility, but No Action is the only available or reasonable alternative to the specific proposals considered in this document.

This document analyzes the potential impacts of specific proposed actions - exploratory oil/gas wells on allotted surface and mineral estate within the boundaries of the Fort Berthold Indian Reservation in Dunn County, North Dakota. The proposed wells 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 access roads, construction of well pads, 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 APDs, 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.

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

A total of about 955 feet (0.18 miles) of new road would be constructed and almost 17,500 feet of existing two-track trail would be improved, including 410 feet (0.08 miles) of new road and 874 feet (0.17 miles) of upgraded two-track into MHA 1-06-31H-150-92; 46 feet (0.01 miles) of new road and 10,958 feet (2.08) of upgraded two track into MHA 1-01H-149-92; 154 feet (0.03 miles) of new road and 403 feet (0.08) of upgraded two track into MHA 1-06H-149-91; and 348 feet (0.07 miles) of new road and 5002 feet (0.95) of upgraded two track into MHA 1-31H-150-91. Signed agreements are in place allowing road construction across affected surface allotments. A maximum disturbed right-of-way (ROW) width of 66 feet would result in a total of 25.4 acres of surface disturbance, including 1.94 acres at MHA 1-06-31H-150-92, 16.67 acres at MHA 1-01H-149-92, 0.65 acres at MHA 1-06H-149-91, and 6.14 acres at MHA 1-31H-150-91. One well is planned for each of the surface locations. Details of road construction are addressed in the Multi-Point Surface Use and Operations Plan in each APD.

Construction would follow road design standards outlined in the Gold Book. A minimum of six (6) inches of topsoil would 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 would be reseeded as soon as practical with a seed mixture determined by the BIA. If commercial production is established from a proposed location, the access road would be graveled with a minimum of four (4) inches of gravel and the roadway would 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 the APDs.

2.3 Well Pads

The proposed well pads 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. Well pad areas would be cleared of vegetation, stripped of topsoil and graded to the specifications in the approved APDs. Topsoil would be stockpiled and stabilized until disturbed areas were reclaimed and re-vegetated. Excavated subsoil would be used in pad construction, with the finished well pads graded to ensure positive water drainage away from the drill sites. Erosion control would 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 each well pad (including reserve pits for drill cuttings) would be about 350' x 450' to accommodate one well. Cut and fill on pad edges plus the pads would result in a total disturbance of about 14 acres for four pads, in addition to the 25.4 acres for road construction. Details of pad construction and reclamation are described and diagrammed in the Surface Use Plan of each well's APD.

2.4 Drilling

After securing mineral leases, Questar submitted APDs to the BLM on dates ranging from August 15, 2009 to September 02, 2009, proposing to drill four wells at four locations:

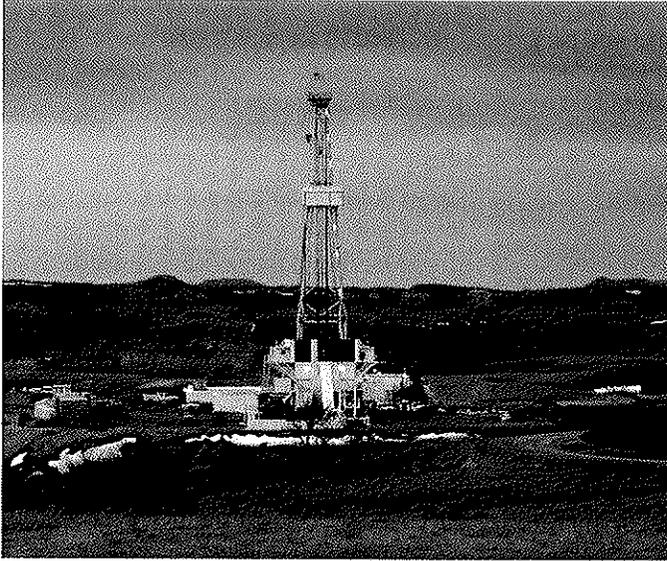
- **MHA 1-06-31H-150-92: SESW of Section 6: T150N-R92W, 5th PM, Dunn County, North Dakota**
- **MHA 1-01H-149-92: NWNE of Section 12: T149N-R92W, 5th PM, Dunn County, North Dakota**
- **MHA 1-06H-149-91: SESE of Section 6: T149N-R91W, 5th PM, Dunn County, North Dakota**
- **MHA 1-31H-150-91: SESE of Section 1: T150N-R91W, 5th PM, Dunn County, North Dakota**

The BLM North Dakota Field Office forwarded copies of the APDs 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 ranging from 9,500 feet to 10,200 feet. The minimum setback of 500 feet (NDCC 43-02-03-18.2) from section lines would be maintained or achieved through directional drilling. Drilling would become roughly horizontal at a measured depth of about 10,200 feet, followed by the drilling of a lateral reach ranging from 4,500 feet to 9,000 feet in length at depths of about 10,200 feet within the Middle Bakken Dolomite Member.

Rig transport and on-site assembly would take about seven days. Drilling operations would require about 35 days at each site to reach the target depth, using a rotary drilling rig. A typical drilling rig is shown in Figure 2.4. For the first 2,000 feet of hole drilled, a fresh-water based mud system with non-hazardous additives such as bentonite would be used to minimize contaminant concerns. Water would be obtained from a commercial source for this drilling stage, using about 22 gallons of water per foot of hole drilled (a total of about 42,000 gallons) per well.

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 drilling fluids can reduce the potential for hole sloughing while drilling through water-sensitive formations, such as shales. About 16,800 gallons of water and 67,200 gallons of diesel fuel would be used per well. Horizontal drilling would utilize saltwater-based mud drilling fluid. 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 fluids. Fluids would be recycled back into the steel tanks for re-use. Upon completion of drilling operations at each location, oil-based fluids would be collected to the extent possible and recycled for use elsewhere. Any free fluids remaining in the reserve pits would be removed and disposed of in accordance with North Dakota Industrial Commission (NDIC) rules and regulations.



Cuttings generated from drilling would be deposited in the reserve pit on each individual well pad. Reserve pits would be lined with an impervious (plastic/vinyl) liner to prevent drilling 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. Prior to use, the entire location 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.

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 each project area. The Dakota Formation is a potential hydrocarbon zone expected to be encountered at a depth of about 5,000 feet, so production casing would be set and cemented to about 11,000 feet. Casing and cementing operations would be conducted in full compliance with *Onshore Oil and Gas Order 2*.

2.6 Completion and Evaluation

After a well has been drilled and cased, a completion (work-over) unit would be moved onto the site. For wells of the depth proposed, about thirty (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. If the target formation is to be fractured to stimulate production, the typical procedure is to pump a mixture of sand and a carrier (e.g., water and/or nitrogen) under extreme pressure downhole. 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 either in the reserve pit or in tanks for disposal in strict accordance with NDIC rules and regulations.

2.7 Commercial Production

If drilling, testing and production support commercial production from any of the proposed locations, additional equipment would be installed, including a pumping unit at the well head, a vertical heater/treater, tanks (usually four 400 barrel steel tanks), 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. A typical producing rig is shown in Figure 2.7 and more detail is included in the APDs.

Oil would be collected in tanks installed on location and periodically trucked to an existing oil terminal for sales. Any produced water would be captured in tanks and periodically trucked to an approved disposal site. The frequency of trucking activities for both 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 more than one hundred years.



Figure 2.7: Typical commercial operation

Large volumes of gas are not expected from these locations. 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 Questar 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

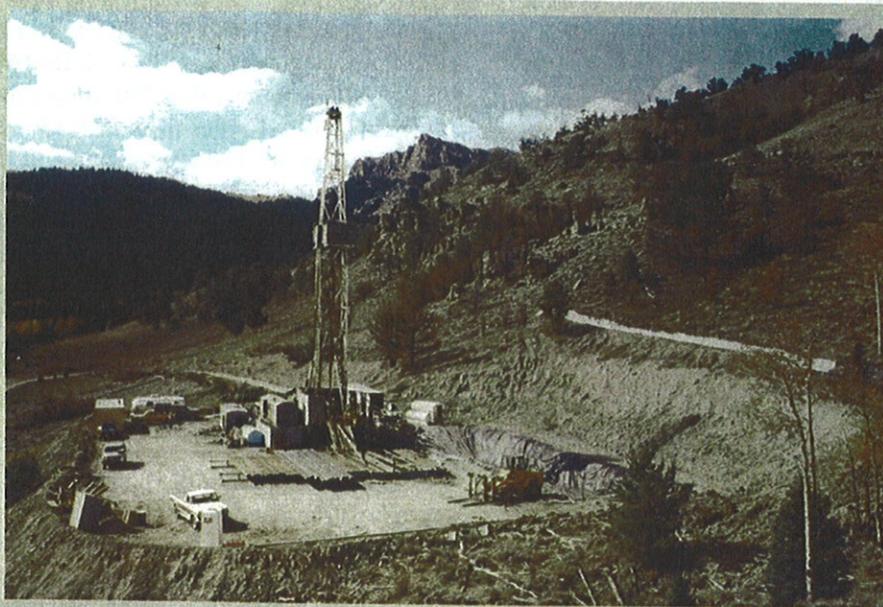
The reserve pit and drill cuttings would be treated, solidified, backfilled and buried as soon as possible after well completion. Any oily residue is dispersed and captured, preventing coalescence and release to the environment at significant rates in the future. Controlled mixing of cuttings with a non-toxic reagent 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 would then be buried in the reserve pit, overlain by at least four feet of overburden as required by NDIC regulations.

If commercial production equipment is installed, the well pad would be reduced in size to about 300' x 200', with the rest of the original pad reclaimed. The working area of each well pad and the running surface of access roads would be surfaced with scoria or crushed rock obtained from a previously approved location. 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. The back slope 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.

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 allottees. The Surface Use Plan within each APD contains additional details regarding both interim and final reclamation measures. Figure 2.8 shows an example of reclamation from the Gold Book.

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Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development



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



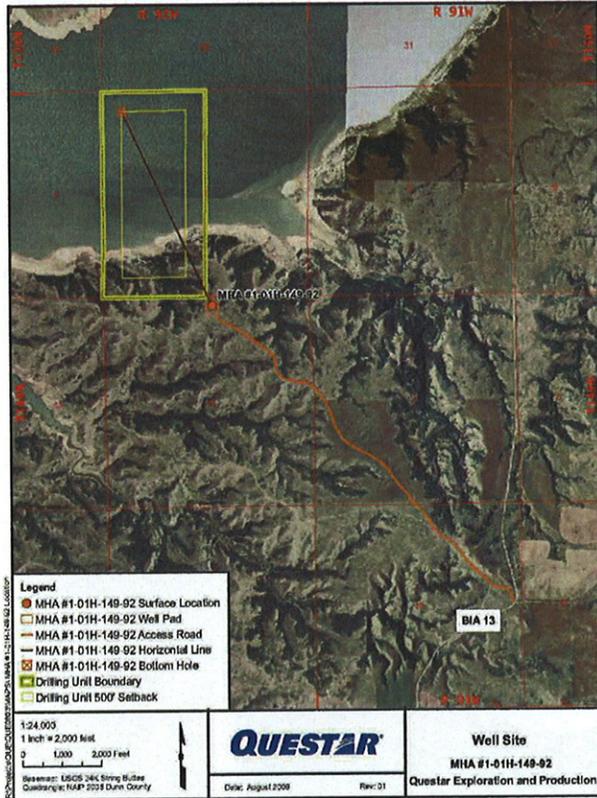
The well pad and access road have been recontoured back to the original contour, the topsoil respread, and the site revegetated.

Figure 2.8: Example of reclamation from the Gold Book

2.9 Construction Details at Individual Sites

One lateral wellbore will be drilled from each of the four surface locations.

MHA #1-01H-149-92



The MHA #1-01H-149-92 well site is located in the NW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 12, T149N, R92W, in Dunn County, ND (Figure 2.9a). The location is approximately 2.1 miles from BIA 13 on bluffs over Lake Sakakawea. The access road will follow an existing two-track from BIA 13 in a northwesterly direction to the pad site. The proposed well site will be approximately 305 feet by 450 feet in size and will disturb approximately 3.8 acres (Table 2.9). Soil stockpiles will be placed on the south and east side of the pad site. General appearance of the well pad and access road are presented in Figure 2.9b and Figure 2.9c.

The surface location of the borehole will be approximately 236 feet (0.04 mile) from the north line (FNL) and 2,506 feet (0.47 mile) from the east line (FEL) of Section 12. The borehole will be directionally drilled horizontally in a northwesterly direction to the bottom hole target at 500 feet (0.09 mile) from the north line (FNL) and 500 feet (0.09 mile) from the west line (FWL) of Section 1.

Figure 2.9a: Well Site Map- MHA #1-01H-149-92

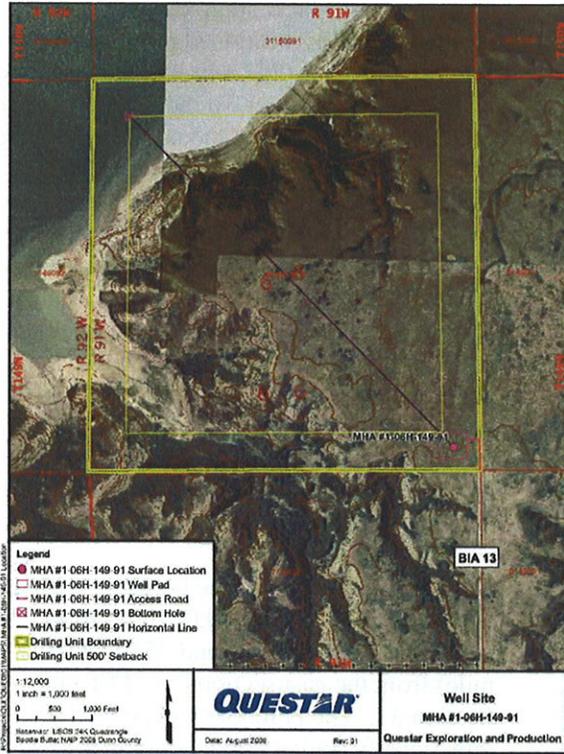


Figure 2.9b: Well Pad- MHA #1-01H-149-92



Figure 2.9c: Access Road- MHA #1-01H-149-92

MHA #1-06H-149-91



The MHA #1-06H-149-91 well site is located in the SE¹/₄SE¹/₄ of Section 6, T149N, R91W, in Dunn County, ND (Figure 2.9d). The surface location is approximately 350 feet from BIA 13. The proposed well site will be approximately 350 feet by 480 feet in size and will disturb approximately 4.0 acres (Table 2.9). Two soil stockpiles will be placed on the south side of the pad site. BIA 13 will be upgraded and extended to the north where the access road begins, extending approximately 175 feet west to the pad site for a total of 571 feet (0.11 mile) of new road, disturbing approximately 0.8 acres. General appearance of the well pad site is presented in Figure 2.9e.

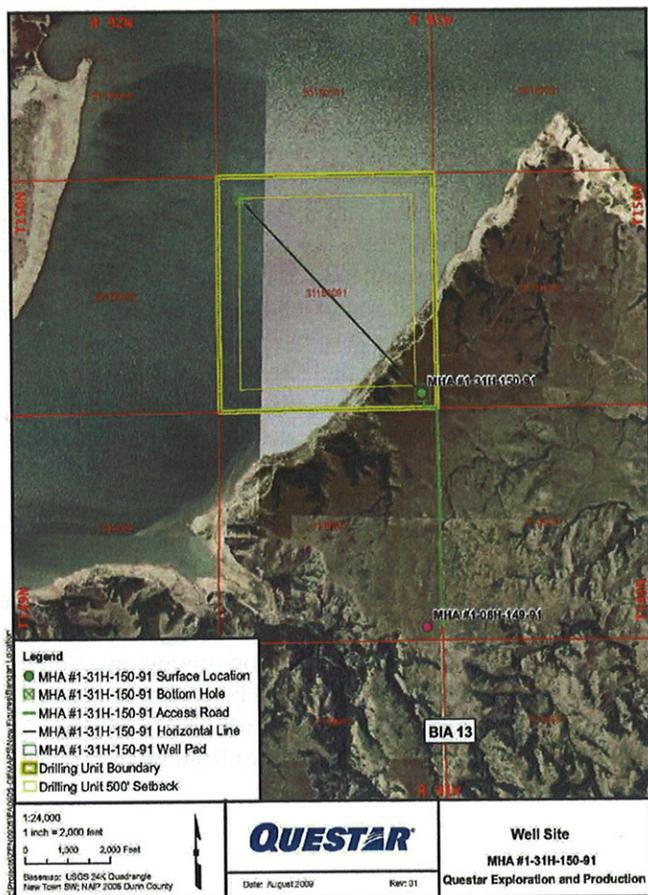
The surface location of the borehole will be approximately 350 feet (0.07 mile) from the south section line (FSL) and 350 feet (0.07 mile) from the east section line (FEL) in Section 6. The borehole will be directionally drilled horizontally in a northwesterly direction to the bottom hole target at 500 feet (0.09 mile) from the north section line (FNL) and 500 feet (0.09 mile) from the west section line (FWL).

Figure 2.9d: Well Site Map- MHA #1-06H-149-91



Figure 2.9e: Well Pad- MHA #1-06H-149-91

MHA #1-31H-150-91



The MHA #1-31H-150-91 well site is located in the SE¹/₄SE¹/₄ of Section 31, T150N, R91W, in Dunn County, ND (Figure 2.9f). This proposed site is approximately 1 mile north of the aforementioned proposed well site, the MHA #1-06H-149-91. Surfaced road BIA 13 will be further extended and upgraded 5,187feet (0.98 mile) to the north beyond the MHA #1-06H-149-91 access road. The access road from BIA 13 will run west approximately 163 feet to the pad site for a total of 5,350feet (1.01 miles) of new road, approximately 8.2 acres of new disturbance. The proposed well site will be approximately 350 feet by 480 feet in size and will disturb an additional 3.9 acres (Table 2.9). Two soil stockpiles will be placed on the west side of the pad site. General appearance of the well pad site and drainage are presented in Figure 2.9g and Figure 2.9h.

The surface location of the borehole will be approximately 343 feet (0.07 mile) from the south section line (FSL) and 357 feet (0.07 mile) from the east section line (FEL) in Section 31. The borehole will be directionally drilled horizontally in a northwesterly direction to the bottom hole target, at 500 feet (0.09 mile) from the north section line (FNL) and 500 feet (0.09 mile) from the west section line (FWL).

Figure 2.9f: Well Site Map- MHA #1-31H-150-91



Figure 2.9g: Well Pad- MHA #1-31H-150-91

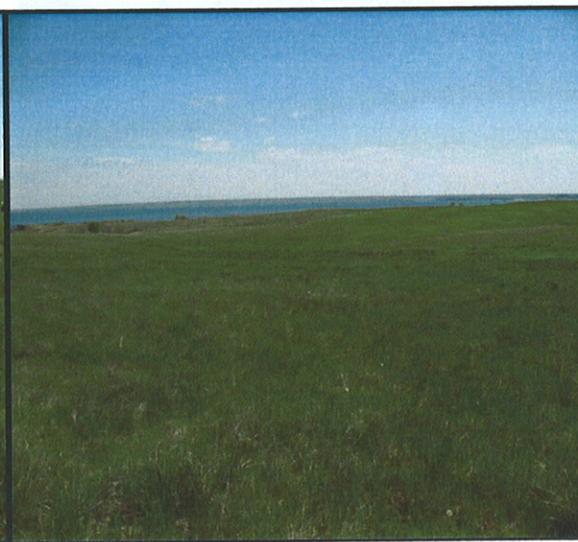
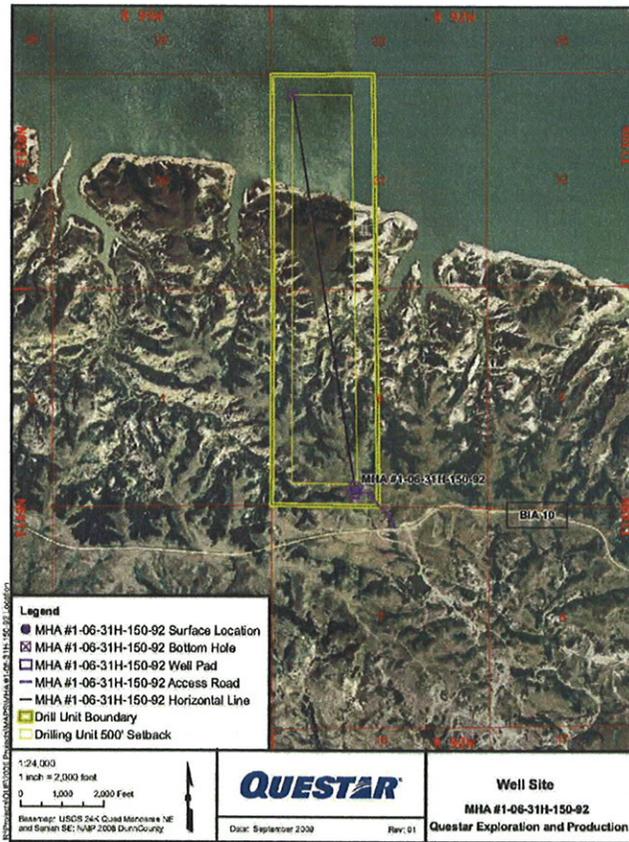


Figure 2.9h: General Drainage- MHA #1-31H-150-91

MHA #1-06-31H-150-92



The MHA #1-06-31H-150-92 well site is located in the SE¼SW¼ of Section 6, T150N, R92W, in Dunn County, ND (Figure 2.9i). This proposed site is approximately 2,285 feet (0.43 miles) northwest of surfaced road BIA 10. The new access road will follow an existing two-track uphill and across hill/ridge tops to the site. Construction of the access road will result in approximately 3.5 acres of new disturbance.

The proposed well site will be approximately 300 feet by 430 feet in size and will disturb an additional 3.0 acres (Table 2.9). Two soil stockpiles will be placed on the north side of the pad site. General appearance of the well pad site is presented in Figure 2.9j.

The surface location of the borehole will be approximately 466 feet from the south section line (FSL) and 2028 feet from the east section line (FEL) in Section 6. The borehole will be directionally drilled horizontally in a northwesterly direction to the bottom hole target into Section 31, at 500 feet from the north section line (FNL) and 500 feet from the west section line (FWL).

Figure 2.9i: Well Site Map- MHA #1-06-31H-150-92

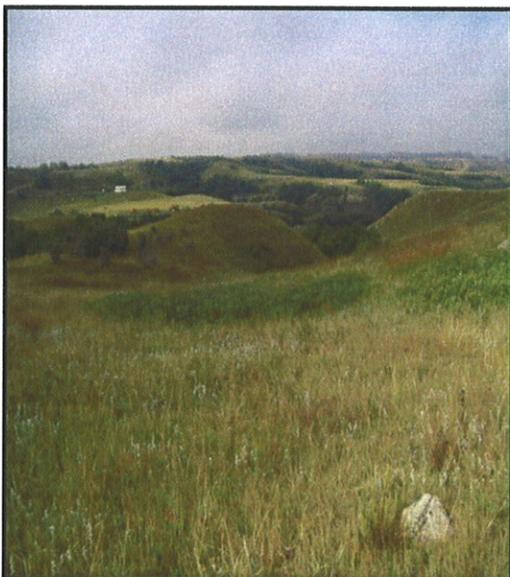


Figure 2.9j: Well Pad- MHA #1-06-31H-150-92

Table 2.9 Estimation of acreage of proposed disturbances

Well Name	Feature	Acres	Total Disturbance (acres)
MHA #1-01H-149-92	Well Pad	3.36	20.03
	Access Route	16.67	
MHA #1-06H-149-91	Well Pad	3.18	3.83
	Access Route	0.65	
MHA #1-31H-150-91	Well Pad	3.31	9.45
	Access Route	6.14	
MHA #1-06-31H-150-92	Well Pad	3.29	5.23
	Access Route	1.94	

2.10 Preferred Alternative

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

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 1954, 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 Garrison 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 projects. 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 sites 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 sites. 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 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, 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 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 (µg/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	0.030	0.001 ppm	0.001 ppm	0.002 ppm
PM ₁₀	24-Hour	150	--	50 (µg/m ³)	35 (µg/m ³)	35 (µg/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

Source: U.S. Environmental Protection Agency (EPA) 2006. µg/m³ = 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 (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 sites. 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 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, SO₂, NO₂, 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 areas (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 any of the proposed sites.

Hydrogen sulfide gas (H₂S) 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 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 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 these proposed well pads according to 2006 data from the AAQM site at the Dunn Center monitoring site (NDDH 2007). No direct impacts from H₂S 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 each of the proposed well sites, 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 any 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 well usually produces both oil and water at a high rate initially. In the vicinity of the proposed projects, 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 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 or traffic. All operations, including flaring, would conform to instructions from BIA fire management staff. Impacts from the proposed projects 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 MHA #1-01H-149-92 well site is located within the Lake Sakakawea Sub-Basin, the Independence Point watershed and Shell Creek Church sub-watershed. Surface water runoff from the well location flows northeast and northwest into drainages that slope directly into Lake Sakakawea. Drainage from the proposed well pad to Lake Sakakawea is less than one-half mile (Table 3.4a and Figure 3.4a).

Table 3.4a: Distance from MHA #1-01H-149-92 to Receiving Water

Source - Point	Distance	
	feet	miles
Well Site to Lake Sakakawea ¹	1,900	0.4

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

National Wetland Inventory (NWI) maps prepared and maintained by the USFWS do not identify any wetlands on the proposed well site. The on-site assessment confirmed that wetlands are not located on the proposed well site or access road.

Due to the proximity of the well site to Lake Sakakawea, operation of a closed loop system is recommended during drilling activities. Risks posed to surface water from operations and spills at this location are moderate to high.



Figure 3.4a: Site Hydrology MHA # 1-01-01H-149-92

The MHA #1-06H-149-91 well site is located Lake Sakakawea Sub-Basin, the Saddle Butte watershed and Lucky Mound Creek Bay Creek sub-watershed. Surface water runoff from the well location flows overland to the north-northeast then into an intermittent stream that flows directly into Lake Sakakawea. Drainage from the proposed well pad to Lake Sakakawea is approximately 1.7 miles (Table 3.4b and Figure 3.4b).

Table 3.4b: Distance from MHA #1-06H-149-91 to Receiving Water

Source - Point	Distance	
	feet	miles
Well Site to Lake Sakakawea ¹	9,186	1.7

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

National Wetland Inventory (NWI) maps prepared and maintained by the USFWS do not identify any wetlands on the proposed well pad site. The on-site assessment confirmed that wetlands are not located on the proposed well site or access road. Wetlands are located approximately 550 feet west of the proposed pad site.

Due to the proximity of the well site to Lake Sakakawea, operation of a closed loop system is recommended during drilling activities. Risks posed to surface water from operations and spills at this location are moderate to high.

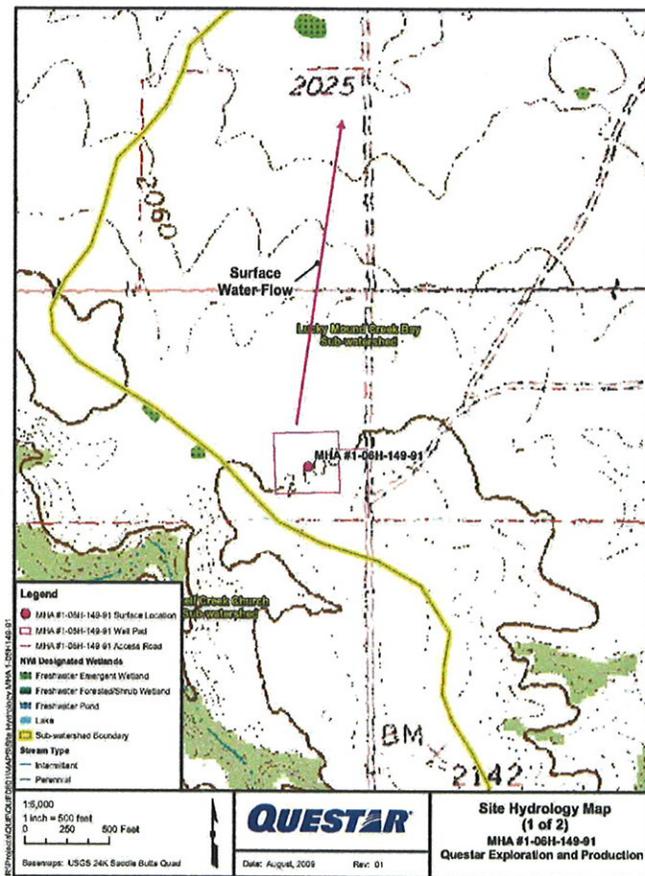


Figure 3.4b: Site Hydrology MHA # 1-06H-149-91

The MHA #1-31H-150-91 well site is located within the Lake Sakakawea Sub-Basin, the Independence Point watershed and Shell Creek Church sub-watershed. Surface water runoff from the well location flows northeast to a drainage leading directly into Lake Sakakawea. Drainage from the proposed well pad to Lake Sakakawea is approximately 0.6 miles (Table 3.4c and Figure 3.4c).

Table 3.4c: Distance from MHA #1-31H-150-91 to Receiving Water

Source - Point	Distance	
	feet	miles
Well Site to Lake Sakakawea	2,890	0.6

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

National Wetland Inventory (NWI) maps prepared and maintained by the USFWS do not identify any wetlands on the proposed well site. The on-site assessment confirmed that wetlands are not located on the proposed well site; however, a freshwater emergent wetland is located approximately 142 feet west of the centerline of the proposed access road (BIA 13).

Due to the proximity of the well site to Lake Sakakawea, operation of a closed loop system is recommended during drilling activities. Risks posed to surface water from operations and spills at this location are moderate to high.

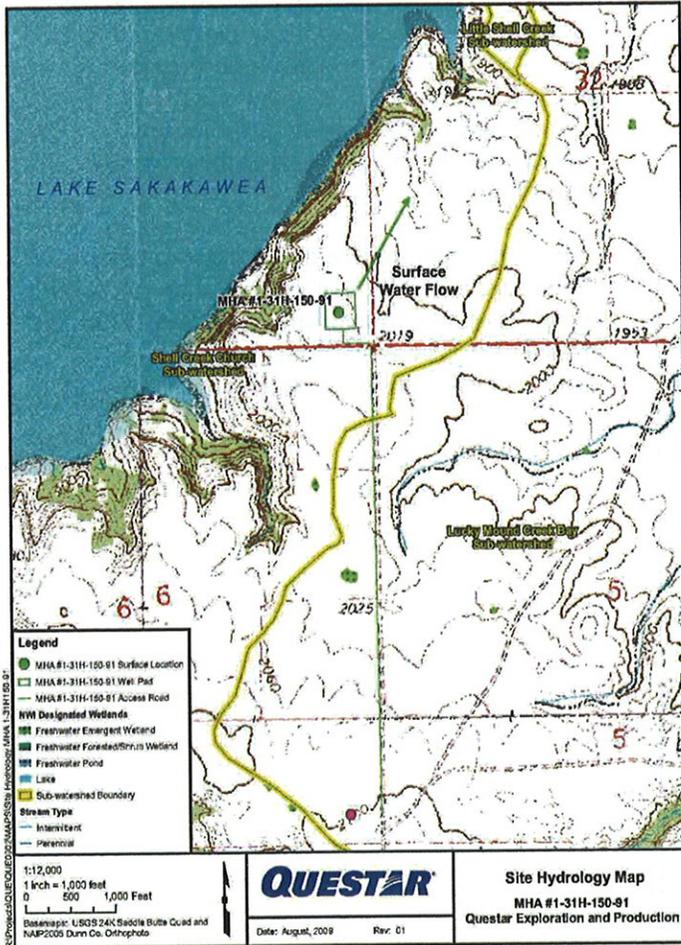


Figure 3.4c: Site Hydrology MHA #1-31H-150-91

The MHA #1-06-31H-150-92 access road starts in the Skunk Creek sub-watershed of the Independence Point watershed in the Lake Sakakawea Sub-Basin. The well site is located in near the sub-watershed divide and located within the Shell Creek Church sub-watershed. The water runoff from the well location flows west to a drainage leading directly into Lake Sakakawea. Drainage from the proposed well pad to Lake Sakakawea is approximately 1.4 miles (Table 3.4d and Figure 3.4d).

Table 3.4d. Distance from MHA #1-06-31H-150-92 to Receiving Water

Source - Point	Distance	
	feet	miles
Well Site to Lake Sakakawea	7,400	1.4

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

National Wetland Inventory (NWI) maps prepared and maintained by the USFWS do not identify any wetlands on the proposed well site. The on-site assessment confirmed that wetlands are not located on the proposed well site.

The proposed well site is located near a steep drainage. Spill control on this site will be important due to the topography and location. Risks posed to surface water from operations and spills at this location are moderate to high.

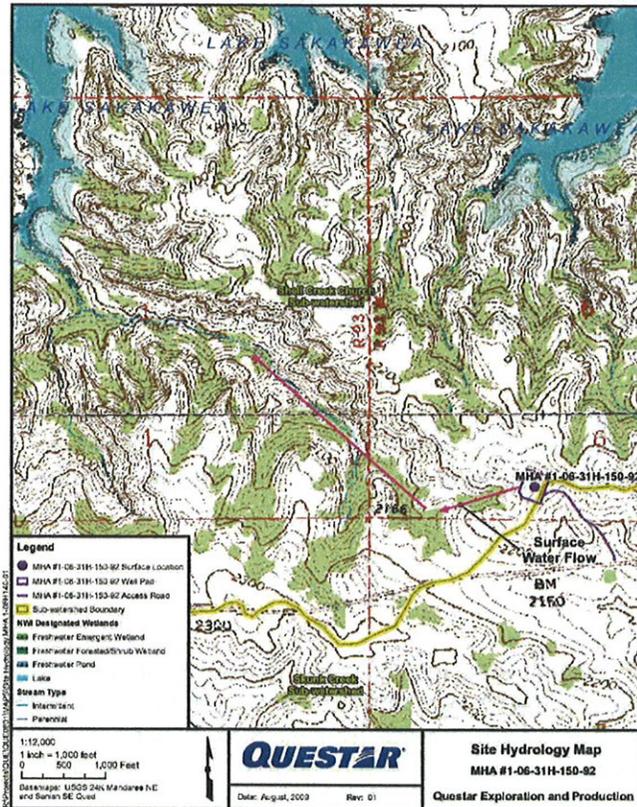


Figure 3.6d: Hydrology Map MHA # 1-06-31H-150-92

Groundwater

Ground water in Dunn County is obtainable from aquifers in the pre-glacial rocks and from aquifers in the glacial drift. Aquifers in the pre-glacial rocks have a greater areal distribution than those in the glacial drift, but those in the drift provide higher yields to individual wells. Sandstone aquifers in the pre-glacial rocks occur in the Fox Hills and Hell Creek Formations of Cretaceous age and in the undifferentiated Cannonball - Ludlow, Tongue River, and Sentinel Butte Formations of Tertiary age. Potential yields to wells tapping these aquifers range from one to as much as 200 gallons per minute (0.06 to 13 liters per second).

The Fox Hills Formation, which is marine in origin, underlies all of Dunn County. The depth to the top of the formation ranges from 1,330 feet (405 m) in the valley of the Little Missouri River in the northwestern part of the county to about 1,960 feet (597 m) in sec. 14, T. 146 N., R. 96 W., also in the northwestern part of the county. The formation ranges in thickness from about 80 to 300 feet (24 to 90 m) and is composed of inter-bedded sandstone, shale, and siltstone. It is underlain by the Pierre Formation and overlain by the Hell Creek Formation.

The Hell Creek Formation, which is continental in origin, underlies the study area at depths ranging from about 1,150 feet (350 m) in the southeastern part of the area to about 1,730 feet (527 m) in the northwestern part. The formation ranges in thickness from about 150 to 300 feet (46 to 90 m) and is composed of inter-bedded siltstone, shale or claystone, poorly consolidated sandstone, and a few thin lignite beds.

The Cannonball Formation, which is marine in origin, and the Ludlow Formation, which is continental in origin, is interfingered throughout Dunn County. The undifferentiated Cannonball-Ludlow Formations underlie the county at depths ranging from about 570 feet (174 m) in the southeastern corner of the county to about 1,130 feet (344 m) in the northwestern quarter of the county. The formations, which range in thickness from 495 to 660 feet (151 to 200 m), consist of inter-bedded siltstone, poorly consolidated sandstone, shale or clay, and lignite.

The Tongue River Formation, which is continental in origin, underlies all of Dunn County. The depth to the top of the formation ranges from about 230 feet (70 m) in the valley of the Little Missouri River in the northwestern corner of the county to about 750 feet (229 m) in sec. 14, T. 146 N., R. 96 W. The formation ranges in thickness from about 290 to 490 feet (88 to 150 m), and consists of inter-bedded siltstone, claystone or shale, poorly consolidated sandstone, lignite, and occasional limestone lenses or concretions. The top of the formation generally consists of lignite or carbonaceous shale. The basal part of the formation generally consists of extensive, poorly consolidated sandstone.

The Sentinel Butte Formation, which is continental in origin, occurs throughout Dunn County, except where glacial melt-water channels have been eroded to below the base of the formation. It is exposed except where overlain by outliers of the Golden Valley Formation, isolated deposits of till, and (or) glaciofluvial and alluvial deposits.

Water Wells and Water Use Permits

MHA #1-01H-149-92

There is one recorded ground water well drilled into the Sentinel Butte aquifer approximately 3.6 miles to the southwest of the MHA #1-01H-149-92. The ground water well is located in the SE1/4 SW1/4, Sec 22, T149N, R92W. Well type, status, and date drilled are unknown. There are no records from the State Water Commission indicating the well production rate or quality of water for this well or purpose of sampling at surface sites. There are no water use permits documented within five miles of this well site.

MHA #1-06H-149-91

The same, single recorded ground water well is located approximately 4.6 miles to the southwest of the MHA #1-06H-149-91. There are no water use permits documented within five miles of this well site.

MHA #1-31H-150-91

There are no recorded ground water wells drilled within 5 miles of the MHA #1-31H-150-91. The closest ground water well is the same as documented above at approximately 5.3 miles to the southwest. One surface water sampling site is recorded 1.5 miles southeast of the proposed well location. There are no water use permits documented within five miles of this well site.

MHA #1-06-31H-150-92

There are five surface sampling sites (springs) and six recorded ground water wells within five miles of the MHA #1-06-31H-150-92 (Table 3.4c). All six of the water wells were drilled into the Sentinel Butte - Tongue River aquifer and are recorded as unknown purpose. The closest of the wells is located in the NE1/4NE1/4 of Section 2, T149N, R93W; approximately 1.9 miles southwest from the proposed well site. The closest spring, the Alice Horn Spring, is approximately one mile west of the site. There are no records from the State Water

Commission indicating the status, production rate, or quality of water for these wells or purpose of sampling at surface sites. There are no water use permits documented within 5 miles of this well site.

Table 3.4e. Water wells within 5 miles of the MHA #1-06-31H-150-92 proposed well site.

LOCATION	Distance (miles) to MHA #1-06- 31H-150-92	Purpose	Aquifer/ Spring	Well Depth (feet)	Date
NE NE 2 T149N R93W	1.9	Unknown	Sentinel Butte-Tongue River	647	1/1/1962
SW SW 33 T149N R93W	4.1	Unknown	Sentinel Butte-Tongue River	338	1/1/1960
SW SW 22 T149N R92W	4.2	Unknown	Sentinel Butte- of Fort Union	40	N/A
SW SW 9 T149N R93W	4.3	Unknown	Sentinel Butte-Tongue River	65	6/1/1952
SE SE 21 T149N R93W	4.7	Unknown	Sentinel Butte-Tongue River	35	N/A
SE SE 8 T149N R93W	4.9	Unknown	Sentinel Butte-Tongue River	500	N/A
NE NE 12 T149N R93W	0.9	Surface Water Sample Site	Alice Horn Spring	0	N/A
SW SW 30 T149N R92W	3.7	Surface Water Sample Site	T Loneflight Spring	0	N/A
NW NW 27 T149N R92W	4.1	Surface Water Sample Site	S. Whitefowl Spring	0	N/A
NE NE 27 T149N R93W	4.1	Surface Water Sample Site	H Youngbird Spring	0	N/A
SE SE 21 T149N R93W	4.9	Surface Water Sample Site	R Birdbear Spring	0	N/A

3.5 Wetland/Riparian Habitat and Threatened or Endangered Species

National Wetland Inventory (NWI) maps maintained by the United States Fish and Wildlife Service (USFWS) do not identify any wetlands within the project areas that would be affected by construction and drilling of the four proposed wells. On-site visits conducted on May 28, June 16 and August 25, 2009, confirmed that no riparian or wetland habitats would be impacted by the proposed well or access road locations.

Species may be listed by the USFWS as threatened or endangered under the *Endangered Species Act (ESA)*. Dunn County species include black-footed ferret, gray wolf, interior least tern, pallid sturgeon, piping plover, and whooping crane (USFWS 2008)(Table 3.5a).

Table 3.5a: Endangered, Threatened, and Candidate Species		
Species	Status	Dunn County
Interior Least Tern	Endangered	X
Whooping Crane	Endangered	X
Black-footed Ferret	Endangered	X
Pallid Sturgeon	Endangered	X
Gray Wolf	Endangered	X
Piping Plover	Threatened	X
W Prairie Fringed Orchid	Threatened	
Dakota Skipper	Candidate	X
Designated Critical Habitat - Piping Plover		X

Although delisted in 2007, the bald eagle remains a species of special concern to the BIA and the Department of the Interior, and is effectively treated the same as a listed species. Tribes and states may recognize additional species of concern; such lists are taken under advisement by federal agencies, but are not legally binding in the manner of the ESA. The state Natural Heritage biological conservation database does not note occurrences of plant or animal species of concern within the proposed project areas (NDNH 2007). The state office considers the appearance of ESA-listed species to be unlikely to rare, based on available reports and the absence of critical, essential, or designated habitat.

¹ USFWS (updated May 15, 2009)

Bald Eagle

Status: delisted in 2007. Likelihood of occurrence: **unlikely**.

The project areas do not contain suitable roosting/perching habitat, concentrated feeding areas, or other special habitats. No impacts are expected.

Black-footed ferret

Status: endangered. Likelihood of occurrence: **unlikely**.

Presence of the black-footed ferret has not been confirmed in North Dakota for over twenty years and the species is presumed extirpated. Impacts are not expected.

Gray wolf

Gray wolves, an Endangered Species in North Dakota, were historically 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 is found around the Turtle Mountains region where documented and unconfirmed reports of gray wolves in North Dakota have occurred (Grondahl and Martin, no date). The proposed projects will have **no effect** on this species at this time.

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 from mid-May through mid-August. The proposed projects will not disrupt the Missouri River habitat. The proposed locations are set back from the Missouri River system (Table 3.5b) and will have **no effect** on this species at this time.

Table 3.5b. Well site distances from Missouri River

Well Site	Linear Distance to Missouri River System (miles) ¹	Shoreline in line-of-sight
MHA #1-01H-149-92	0.4	no
MHA #1-06H-149-91	0.7	no
MHA #1-31H-150-91	0.2	no
MHA #1-06-31H-150-92	1.4	no

¹River distance based on NAIP 2006 Dunn County Orthophoto

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 (Table 3.5b). The proposed projects will have *no effect* on this species at this time.

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 (Table 4).

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.

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.

The proposed sites are located on native mixed grass prairie and include some potential habitat. At the time of the site visits, each site had good residual cover but lacked the high native forb diversity habitat required by the Dakota skipper. The proposed well sites may affect individuals but *are not likely to adversely affect* the population or species.

Whooping crane

The primary nesting area for the whooping crane is in Canada's Wood Buffalo National Park. Aransas 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.

3.6 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 moderate to high 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.

MHA #1-01H-149-92

The NRCS has identified three Mapping Units (MU's) on this proposed well site and access road: Temvik silt loams, Zahl and Williams loams, and a small amount of Cohagen-Veabar-Rock outcrop complex soils (Tables 3.6a, 3.6b and Figure 3.6a).

The proposed well site is located on a relatively level upland of mixed grass prairie that breaks quickly to steep-sided wooded areas and breaks. Soils on the site are well drained with moderate erosion potential. At the perimeter of the site, slopes break quickly and thus have a high impact on erosion potential. These soils exhibit low infiltration with high runoff and are susceptible to erosion. On-site inspection confirms that

surface soils consist of clay and silt loams with some sand present. The soils are generally brown in color. Topsoil across the site is approximately 12" inches deep.

The proposed route follows an existing two-track established on uplands across level to rolling hills. Soils along the road are predominantly classified as Temvik silt loams on the flat plateaus with Zahl-Williams loams being the other major components along the route. Smaller inclusions of soils along the access road include Cohagen-Veabar fine sandy loams. These soils are fine sandy loam found on steeper slopes along hillsides and drainages. Visual inspection confirmed that surface soils along the access road are fine-grained, sandy and clay loams. Topsoil ranges from almost none (1-4") through the Cohagen-Veabar-Rock outcrop unit, to approximately 12-14" where Zahl and Williams soils are present.

Soils along portions of the access road have a moderate to high susceptibility to erosion. Erosion potential on the site and route will increase in the interval between construction and reclamation, as vegetation and topsoil are removed. The area should be monitored for

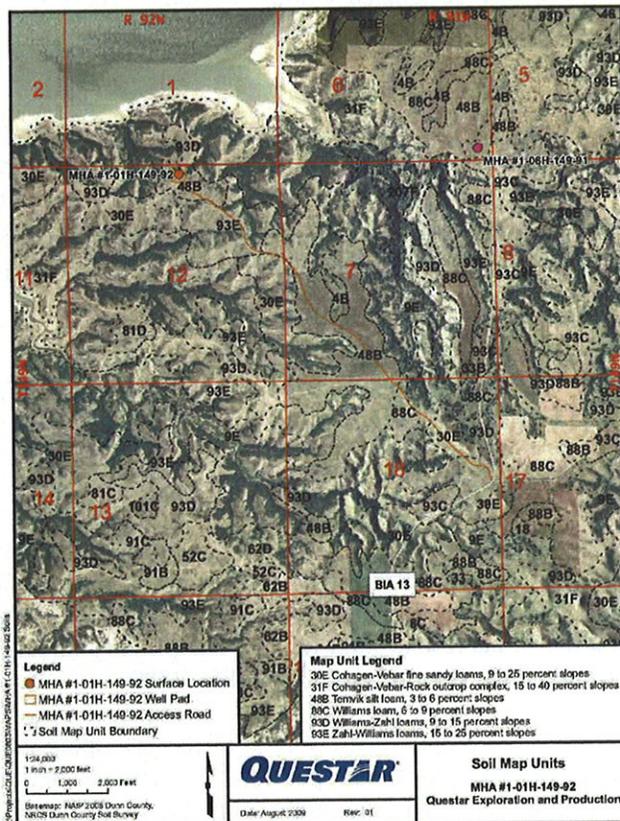


Figure 3.6a: Soil Map Units MHA # 1-01H-149-92

erosion, during and following construction, and best management practices implemented if erosion is detected. Preventative measures are recommended to prevent runoff onto the steeper slopes.

Table 3.6a. MHA #1-01H-149-92 Soils and Attributes

Soil Name ¹	Pad Acres ²	Road Acres (66ft ROW)	Landscape ³			Erosion and Runoff Factors ⁴			Soil Composition ⁵		
			Land-form	Down slope Shape	% slope	Hydrologic group	Kf	T factor	% Sand	% Silt	% Clay
Temvik	2.9	8.3	risers	convex	3-6	B	.32	5	11	67	22
Zahl - Williams loams	0.5	6.1	hills, ridges	linear	9-25	B	.28	5	41	37	22
Cohagen-Vebar-Rock outcrop complex	0.3	2.0	hills	convex	15-40	B-D	.20-.24	1-3	70	16	14

¹ NRCS Map Units, major and minor components

² Final pad layout plus 1.0 acre estimated disturbance outside final pad construction

³ Landscape

- Landform and down slope shape are indicators of erosion and deposition characteristics.
- Slope is indicated as an average or typical gradient under which soils form.

⁴ Erosion and runoff factors indicate susceptibility of soils to erosion to wind or water:

- Hydrologic Soil Group (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).
- Kf indicates erodibility of material less than 2 millimeters in size to sheet and rill erosion by water. Values of Kf 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.

⁵ Texture of surface horizon

Table 3.6b. MHA #1-01H-149-92 Soil Texture

Soil	MU	Depth (in)	Texture
Temvik	48B	0 to 12 inches	Silt loam, Topsoil
		12 to 24 inches	Silt loam
		24+ inches	Clay loam
Zahl-Williams loams	93D, 93E, 88C	0 to 12 inches	Silt loam, Topsoil
		12 to 24 inches	Silt loam
		24+ inches	Clay loam
Cohagen-Vebar-Rock outcrop	31F	0 to 3 inches	Fine sandy loam, Topsoil
		3 to 17 inches	Fine sandy loam
		17+ inches	Bedrock

The soils at the proposed well site and along the proposed access road are suitable for construction. The surface soils lend well for restoration with the exception of the Cohagen-Vebar-Rock outcrop soils along the access road. These soils are very fine with little to no topsoil present.

MHA #1-06H-149-91

The MHA #1-06H-149-91 well site is located on mixed grass prairie. The NRCS has identified three Mapping Units (MU's) on the proposed well site and access road: Williams loams, Arnegard loams, and Temvik silt loams (Tables 3.6c, 3.6d and Figure 3.6b). Field inspection verified the presence of silty loams and clay loams with trace amounts of sand. Topsoil ranges from approximately 8-14 inches thick across the proposed well site and access road.

The southern portion of the well pad and access road to the section line are classified as Arnegard loams (MU 4B). These soils are well drained and described as an alluvial fan landform. Arnegard loams comprise 90% of the mapping unit, and Amor, Belfield and Williams soils combined comprise 10%. NRCS classifies the northwest corner of the site as MU 48B, Temvik silt loam, with 3-6% slopes. These are well drained and are found on convex and linear uplands. The portion of BIA 13 that will be extended north along the section line to the access road crosses Williams loams, (MU 88C). These soils are also well drained and found on knolls and linear uplands with 6-9 percent slopes.

Soils at the proposed well site are suitable for construction and lend well to restoration. Soils in the mapping units have Kf ratings ranging from 0.24-0.32, indicative of moderate erosion potential. Erosion potential is greatest in the interval between construction and reclamation, as vegetation and topsoil is removed. Erosion potential increases with increased slope. The site is relatively level with the site draining to the north-northeast after construction.

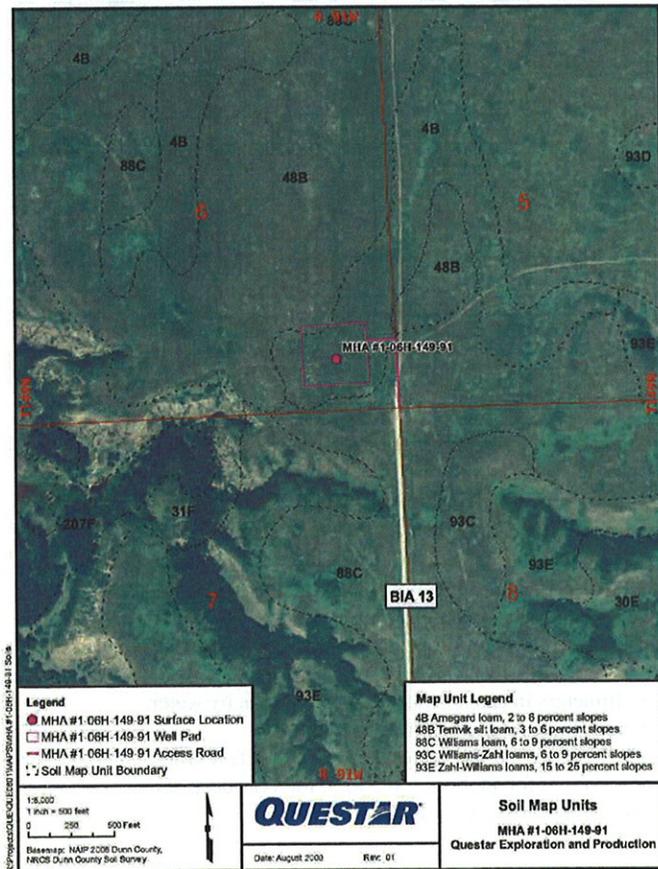


Figure 3.6b: Soil Map Units MHA #1-06H-149-91

Table 3.6c. MHA #1-06H-149-91 Soils and Attributes

Soil Name ¹	Pad Acres ²	Road Acres (66ft ROW)	Landscape ³			Erosion and Runoff Factors ⁴			Soil Composition ⁵		
			Land- form	Down slope Shape	% slope	Hydrologic group	Kf	T factor	% Sand	% Silt	% Clay
Arnegard	3.8	0.2	alluvial fan	linear	2-6	B	.24	5	41	37	22
Temvik	0.2	0.0	rises	convex	3-6	B	.32	5	11	67	22
Williams	0.0	0.6	knolls	linear	6-9	B	.28	5	41	37	22

¹ NRCS Map Units, major and minor components

² Final pad layout plus 1.0 acre estimated disturbance outside final pad construction

³ Landscape

- Landform and down slope shape are indicators of erosion and deposition characteristics.
- Slope is indicated as an average or typical gradient under which soils form.

⁴ Erosion and runoff factors indicate susceptibility of soils to erosion to wind or water:

- Hydrologic Soil Group (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).
- Kf indicates erodibility of material less than 2 millimeters in size to sheet and rill erosion by water. Values of Kf 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.

⁵ Texture of surface horizon

Table 3.6d. MHA #1-06H-149-91 Soil Texture

Soil	MU	Depth (in)	Texture
Arnegard	4B	0 to 13 inches	Loam, Topsoil
		13+ inches	Loam
Temvik	48B	0 to 14 inches	Silt loam, Topsoil
		14 to 24 inches	Silt loam
		24+ inches	Clay loam
Williams	88C	0 to 6 inches	Loam, Topsoil
		6 to 10 inches	Clay loam, Topsoil
		10+ inches	Clay loam

MHA #1-31H-150-91

The MHA #1-31H-150-91 well site is located on relatively level native prairie. The NRCS has identified the Mapping Units (MUs) on the proposed well site as Temvik silt loams (MU 48B). Field inspection verified the presence of silty loams with trace amounts of sand (Tables 3.6e, 3.6f and Figure 3.6c).

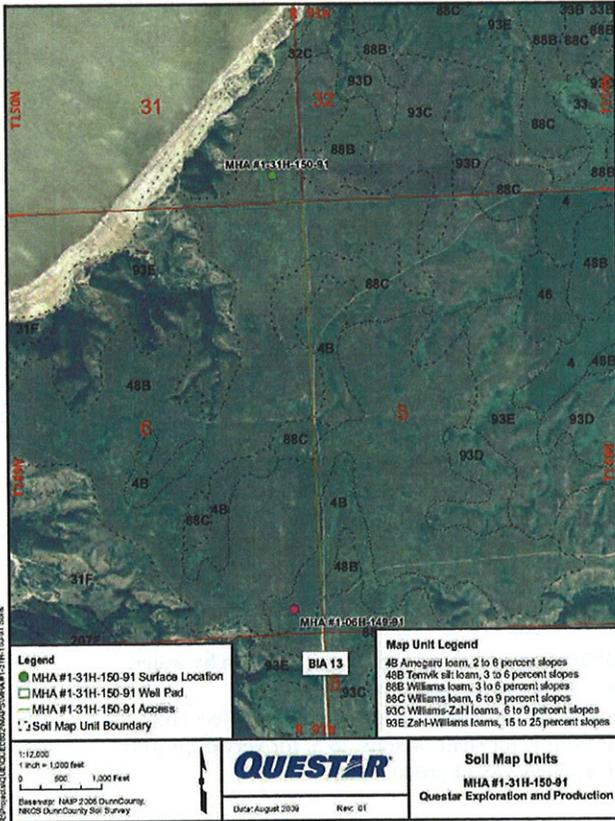


Figure 3.6c: Soil Map Units MHA #1-31H-150-91

Topsoil is generally 10-14” inches thick across the proposed well site.

Portions of the access road (BIA 13 extension) along the section line are classified as Arnegard loams (MU 4B). These soils are well drained and described as an alluvial fan landform. Arnegard loams. These are well drained and are found on convex and linear uplands. The access road also crosses some Williams loams, (MU 88C). These soils are also well drained and found on knolls and linear uplands with a 6-9 percent slopes. Topsoil along the access road ranges from 8-14” inches thick.

Soils at the proposed well site and access road are suitable for construction and lend well to restoration. Soils in the map unit have Kf ratings ranging from 0.24-0.32, indicative of moderate erosion potential. Erosion potential is greatest in the interval between construction and reclamation, as vegetation and topsoil is removed. Erosion potential increases with increased slope. The site is relatively level with a slight slope to the northeast where the constructed pad site will drain.

Table 3.6e. MHA #1-31H-150-91 Soils and Attributes

Soil Name ¹	Pad Acres ²	Road Acres (66ft ROW)	Landscape ³			Erosion and Runoff Factors ⁴			Soil Composition ⁵		
			Land- form	Down slope Shape	% slope	Hydrologic group	Kf	T factor	% Sand	% Silt	% Clay
Arnegard	0.0	1.7	alluvial fan	linear	2-6	B	.24	5	41	37	22
Temvik	3.9	4.8	rises	convex	3-6	B	.32	5	11	67	22
Williams	0.0	1.7	knolls	linear	6-9	B	.28	5	41	37	22

¹ NRCS Map Units, major and minor components

² Final pad layout plus 1.0 acre estimated disturbance outside final pad construction

³ Landscape

- Landform and down slope shape are indicators of erosion and deposition characteristics.
- Slope is indicated as an average or typical gradient under which soils form.

⁴ Erosion and runoff factors indicate susceptibility of soils to erosion to wind or water:

- Hydrologic Soil Group (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).

- Kf indicates erodibility of material less than 2 millimeters in size to sheet and rill erosion by water. Values of Kf 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.
- ⁵ Texture of surface horizon

Table 3.6f. MHA #1-06H-149-91 Soil Texture

Soil	MU	Depth (in)	Texture
Arnegard	4B	0 to 13 inches	Loam, Topsoil
		13+ inches	Loam
Temvik	48B	0 to 24 inches	Silt loam
		7 to 24 inches	Silt loam
		24+ inches	Clay loam
Williams	88C	0 to 6 inches	Loam, Topsoil
		6 to 10 inches	Clay loam, Topsoil
		10+ inches	Clay loam

MHA #1-06-31H-150-92

The MHA #1-06-31H-150-92 well site is located on mixed grass prairie. The NRCS has identified two Mapping Units (MUs) on the proposed well site and access road: Cabba loams and Cohagen-Vebar fine sandy loams (Tables 3.6g, 3.6h and Figure 3.6d).

The start of the access road at BIA 10 are classified as Cabba loams (MU 9E). These soils are well drained and described as found on a ridge landform. NRCS classifies the rest of the access and pad site as MU 30E, Cohagen-Vebar fine sandy loams, with 9-25% slopes. These are well drained and are found on convex and linear upland hills.

The field inspection verified that silty and clay loams are found along the hillsides and lower portions of the proposed access road. Some sand is present in soil samples and the topsoil is approximately 6-10" thick.

Soils on the hilltops and along the ridges, however, are sandy with numerous rocks and gravel present. The topsoil is thin (<4") and very light/fine grained.

Surface soils at the proposed well site are suitable for construction and lend well to restoration. Surface soils along the proposed access road are suitable for construction but are not easily reclaimed. Soils in the mapping units have Kf ratings ranging from 0.20-0.32, indicative of moderate erosion potential. Erosion potential is greatest in the interval between construction and reclamation, as

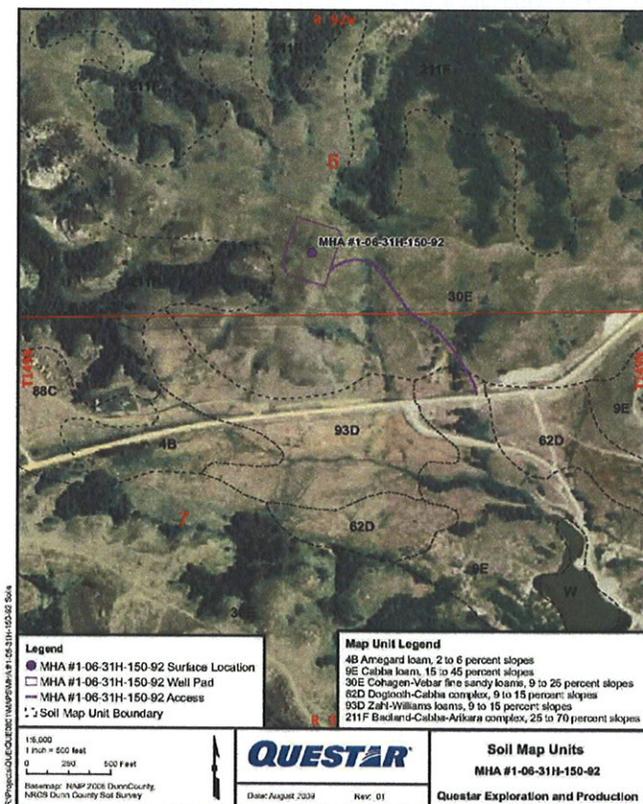


Figure 3.6d: Soil Map Units MHA #1-06-31H-150-92

vegetation and topsoil is removed. Erosion potential increases with increased slope. The site is a well-drained hillside with the site draining to the west-southwest after construction.

Table 3.6g. MHA #1-06-31H-150-92 Soils and Attributes

Soil Name ¹	Pad Acres ²	Road Acres (66ft ROW)	Landscape ³			Erosion and Runoff Factors ⁴			Soil Composition ⁵		
			Land-form	Down slope Shape	% slope	Hydrologic group	Kf	T factor	% Sand	% Silt	% Clay
Cabba	0.0	0.2	ridges	convex	3-70	D	.32	2	42	38	20
Cohagen-Vebar	3.3	1.7	hills	convex	9-25	D	.24	2	70	16	14

¹ NRCS Map Units, major and minor components

² Final pad layout plus 1.0 acre estimated disturbance outside final pad construction

³ Landscape

- Landform and down slope shape are indicators of erosion and deposition characteristics.
- Slope is indicated as an average or typical gradient under which soils form.

⁴ Erosion and runoff factors indicate susceptibility of soils to erosion to wind or water:

- Hydrologic Soil Group (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).
- Kf indicates erodibility of material less than 2 millimeters in size to sheet and rill erosion by water. Values of Kf 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.

⁵ Texture of surface horizon

Table 3.6h. MHA #1-06-31H-150-92 Soil Texture

Soil	MU	Depth (in)	Texture
Cabba	9E	0 to 3 inches	Loam, Silt loam, Topsoil
		3 to 15 inches	Clay loam, Loam
Cohagen-Vebar	30E	0 to 3 inches	Fine, sandy loam
		3 to 17 inches	Silt loam, Clay loam

3.7 Vegetation and Invasive Species

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 Dunn County 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 (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), side-oats grama (*Bouteloua curtipendula*), green needlegrass (*Nassella viridula*), and western wheatgrass (*Pascopyrum smithii*). Typical wetland plants are smartweed (*Polygonum amphibium*), sedge species (*Carex sp.*), bulrush (*Scirpus sp.*), bluejoint (*Calamagrostis Canadensis*), and cattail (*Typha sp.*). Woody draws, coulees, and drainages may host communities of chokecherry (*Prunus virginiana*), buffaloberry (*Shepherdia argentea*), western snowberry (*Symphoricarpos occidentalis*), and gooseberry (*Ribes sp.*).

Invasive species is a general term referring to plants that are not native to an area, that spread aggressively, and have negative economic and environmental impacts. Otherwise known as noxious weeds, these species can spread easily to the detriment of public health, indigenous plant communities, crops, livestock, recreational areas, and the management of natural or agricultural systems. Of twelve species declared noxious under the North Dakota Century Code (Chapter 63-01.1), five are known to occur in Dunn County, including absinth wormwood, Canada thistle, dalmation toadflax, field bindweed, and leafy spurge (NDAA 2007). Table 3.7 shows Dunn County acreage for these species. No additional species have been designated by the county within its jurisdiction. Additional information is available from the NRCS Plants Database for North Dakota at <http://plants.usda.gov>.

Table 3.7: Invasive species

Common Name	Scientific Name	Dunn County Acres
Absinth wormwood	<i>Artemisia abinthium</i> L.	24,500
Canada thistle	<i>Cirsium arvense</i> (L.) Scop	22,705
Dalmation toadflax	<i>Linaria genistifolia</i> ssp. <i>dalmatica</i>	2
Diffuse knapweed	<i>Centaurea diffusa</i> Lam	--
Field bindweed	<i>Convolvulus arvensis</i> L.	19,800
Leafy spurge	<i>Euphorbia esula</i> L.	8,302
Musk thistle	<i>Carduus nutans</i> L.	--
Purple loosestrife	<i>Lythrum salicaria</i>	--
Russian knapweed	<i>Acroptilon repens</i> (L.) DC.	--
Saltcedar (tamarisk)	<i>Tamarix ramosissima</i>	0
Spotted knapweed	<i>Centaurea maculosa</i> Lam.	--
Yellow starthistle	<i>Centaurea solstitialis</i> L.	--

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

An evaluation of the existing vegetation during the on-site assessments did not indicate the presence of any listed noxious weed species within the proposed project areas. Potential disturbance of almost 40 acres and removal of existing vegetation present opportunities for invasive species and threaten to reduce the quality or quantity of forage or crop production. 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 the project area. **Surface disturbance and vehicular traffic must not take place outside approved rights-of-way or the well pad.** 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 Kadmas, Lee & Jackson, Inc., using a pedestrian methodology. For the MHA #1-06H-149-91 project approximately 10 acres were intensively inventoried on May 4, 2009 (Ó Donnchadha 2009a). For the MHA #1-31H-150-91 project approximately 48 acres were inventoried (Ó Donnchadha 2009b); and for the MHA #1-06H-149-92 [MHA 31-06-31H-150-92] project approximately 14.3 acres were inventoried (Ó Donnchadha 2009c). These three surveys were done on May 4, 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 a determination of **no historic properties affected** for these undertakings. This determination was communicated to the THPO on June 3, 2009, and the THPO concurred on June 18, 2009. For the MHA #1-01H-149-92 project approximately 22.9 acres were inventoried on June 15, 2009 (Ó Donnchadha 2009d). BIA reached a determination of **no historic properties affected** for this undertaking on September 23, 2009, and the THPO concurred on October 6, 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 everywhere else 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 projects are 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 projects 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. Fair treatment means such groups should not bear a disproportionately high share of negative environmental consequences from federal programs, policies, decisions or operations. Meaningful involvement means federal officials actively promote opportunities for public participation and federal decisions can be materially affected by participating groups and individuals.

The 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 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 well locations and access road routes 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 will 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 projects have 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 projects offer many positive consequences for tribal members, while recognizing Environmental Justice concerns. Procedures summarized in this document and in the APDs 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 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.

3.12 Irreversible and Irrecoverable 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 areas. The small areas dedicated to the access roads and well pads would be unavailable for livestock grazing, wildlife habitat and other uses. Allottees with surface rights would be compensated for loss of productive acreage and project footprints would shrink considerably once wells 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

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.

There are no floodplains or major drainage facilities adjacent to the proposed well sites. Current land uses are expected to continue. Increased truck traffic on adjacent roadways can be expected and has a documented negative, but manageable, impact on road conditions.

The primary industrial developments in the area are oil and gas exploration. Further oil and gas development is proposed in the area. The discovery of the Bakken Formation has resulted in a dramatic increase in exploration. Currently, there is only one active well site within five miles of the proposed well sites; however, Questar’s long-range planning includes the development of additional well sites in the area.

Oil and gas developments surrounding the proposed well sites were tabulated by well status and established distances from these proposed disturbances. There are approximately 189 oil and gas wells actively operating with 20 miles of the proposed well sites. Also within 20 miles, there are another 132 proposed well sites (not yet permitted) and 22 sites that have been issued permits to drill and 8 sites where active drilling is taking place, or has recently finished. Overall, there are approximately 354 oil and gas wells that are active, proposed, or being drilled within a 20-mile radius of the proposed well sites (Table 3.14 and Figure 3.14). Several of these occur outside of the Fort Berthold Reservation. Several wells are located just north of Fort Berthold in Mountrail County. On Fort Berthold, 198 wells are active, proposed, permitted or being drilled according to the NDIC dated August 24, 2009.

Table 3.14. 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	0	0	0	0
1-5 miles	1	7	0	0	8
5-10 miles	14	25	5	1	45
10-20 miles	174	100	17	7	301
Cumulative Total (20-mile radius)	189	132	22	8	354
Fort Berthold Reservation	85	89	17	7	198

¹NDIC OG well status - August 24, 2009

Questar’s long-range planning goals include the development of four more wells in the general vicinity of the wells included in this assessment. The future wells are tentatively located in Section 4, T149N, R92W; Section 32, T150N, R91W; and Section 4, T149N, R91W. Existing access roads and those being proposed in this assessment will be utilized to the extent possible; however, additional roads will be constructed to service these locations.

Alone, the proposed project will have negligible impacts on the overall landscape; however, minor disturbances over a period of time may accumulate and detrimentally affect the local environment. Careful planning and the use of best management practices (e.g. erosion control, spill containment, etc.) should be implemented during construction and operation to help decrease impacts and reduce cumulative effects.

Reclamation of the sites should take place as soon as possible when oil activities have been completed. Sites should be restored to a land use similar to that, which existed prior to disturbance.

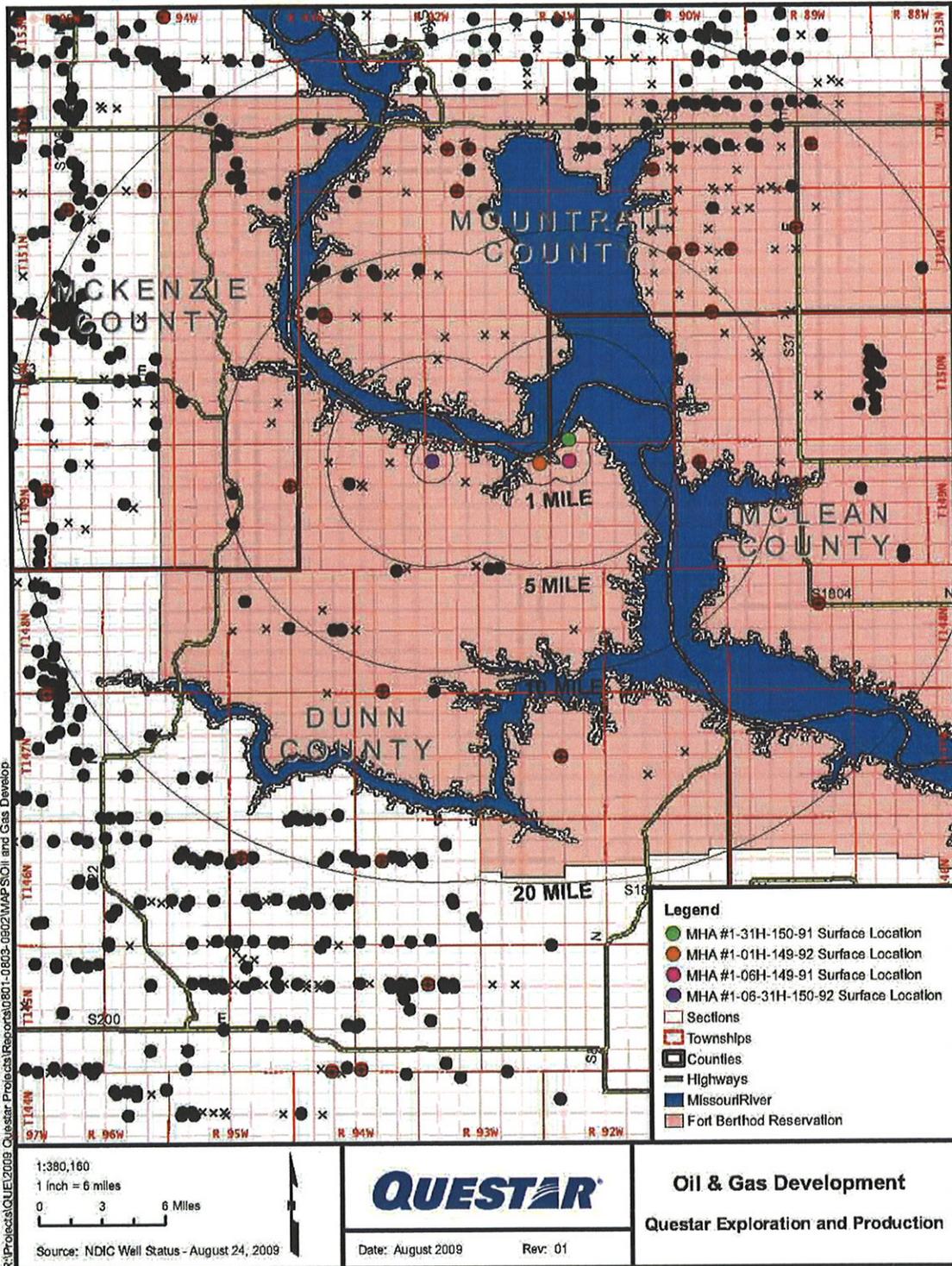


Figure 3.14: Approved or proposed oil and gas projects

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 this 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 Natural Historic Preservation. 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

JUN 03 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 and access roads in Dunn and McLean Counties, North Dakota. Approximately 82.3 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-1626/FB/09**, the proposed undertakings, locations, and project dimensions are described in the following reports:

- Ó Donnchadha, Brian
(2009) MHA 1-06H-149-91 Well Pad and Access Road: A Class III Cultural Resource Inventory, Dunn County, North Dakota. KLJ Cultural Resources for Questar Exploration and Production Company, Denver.
- (2009) MHA 1-06H-149-92 Well Pad and Access Road: A Class III Cultural Resource Inventory, Dunn County, North Dakota. KLJ Cultural Resources for Questar Exploration and Production Company, Denver.
- (2009) MHA 1-31H-150-91 Well Pad and Access Road: A Class III Cultural Resource Inventory, Dunn County, North Dakota. KLJ Cultural Resources for Questar Exploration and Production Company, Denver.
- (2009) MHA 1-10H-149-90 & MHA 1-04H-149-90 Well Pad and Access Road: A Class III Cultural Resource Inventory, McLean County, North Dakota. KLJ Cultural Resources for Questar Exploration and Production Company, Denver.

Page 2

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



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

June 18, 2009

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

RE: Project # AAO-1626/FB/09

MHA 1-06H-149-91 well pad and access road
MHA 1-06H-149-92 well pad and access road
MHA 1-31H-150-91 well pad and access road
MHA 1-10H-149-90 well pad and access road
MHA 1-04H-149-90 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

SEP 23 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 Dunn County, North Dakota. Approximately 22.9 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-1626/FB/09**, the proposed undertaking, location, and project dimensions are described in the following report:

Ó Donnchadha, Brian
(2009) MHA #1-01H-149-92 Well Pad and Access Road: A Class III Cultural Resource Investigation in Dunn County, North Dakota. KLJ Cultural Resources for Questar Exploration and Production Company, Denver.

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

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

Sincerely,

Regional Director

Enclosure

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



TRIBAL HISTORIC PRESERVATION

Mandan Hidatsa Arikara

Perry 'No Tears' Brady, Director.

404 Frontage Road,

New Town, North Dakota 58763

Ph/701-862-2474 fax/701-862-2490

pbrady@mhanation.com

October 6, 2009

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

RE: Project # AAO-1626/FB/09
MHA 1-01H-149-92 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 culturally-related issue or others arise as the Project progresses.

Sincerely,

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

5. List of Preparers

An interdisciplinary team contributed to this document, following guidance in Part 1502.6 of CEQ regulations. Preparers, reviewers, consultants and federal officials include the following:

- Questar Exploration & Production:
 - Debbie Stanberry, Regional Supervisor-Regulatory Affairs
 - Tracy Opp, Regulatory Affairs
 - Dan Stone, Drilling Manager
 - Scott Goodwin, Production Engineer
 - Questar HS&E

- McCain and Associates-Environmental Consultant

- Kadrmass, Lee, & Jackson-Survey & Archeology

- Division of Environmental, Safety and Cultural Resource Management

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Acronyms

AAQM	Ambient Air Quality Monitoring (site)	NAGPRA	Native American Graves Protection and Repatriation Act
AIRFA	American Indian Religious Freedom Act	NDCC	North Dakota Century Code
APD	Application for Permit to Drill	NDDH	North Dakota Department of Health
APE	Area of Potential Affect	NDIC	North Dakota Industrial Commission
BIA	Bureau of Indian Affairs	NDNH	North Dakota Natural Heritage
BLM	Bureau of Land Management	ND SWC	North Dakota State Water Commission
CFR	Code of Federal Regulations	NEPA	National Environmental Policy Act
EA	Environmental Assessment	NHPA	National Historic Preservation Act
EIS	Environmental Impact Statement	NPAL	Northern Plains Agroecosystems Laboratory
EPA	Environmental Protection Agency	NRCS	Natural Resources Conservation Service
FONSI	Finding of No Significant Impact	NRHP	National Register of Historic Places
GPRO	Great Plains Regional Office	NTL	Notice to Lessees
MHA Nation	Three Affiliated Tribes of the Mandan, Hidatsa and Arikira Nation		

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 U.S. Forest Service
USFWS U.S. Fish and Wildlife Service
USGS U.S. Geological Survey

Notice of Availability and Appeal Rights

Questar: MHA #1-06H-149-91
MHA #1-01H-149-92
MHA #1-31H-150-91
MHA #1-06-31H-150-92

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 Questar is expected to begin in 2009.

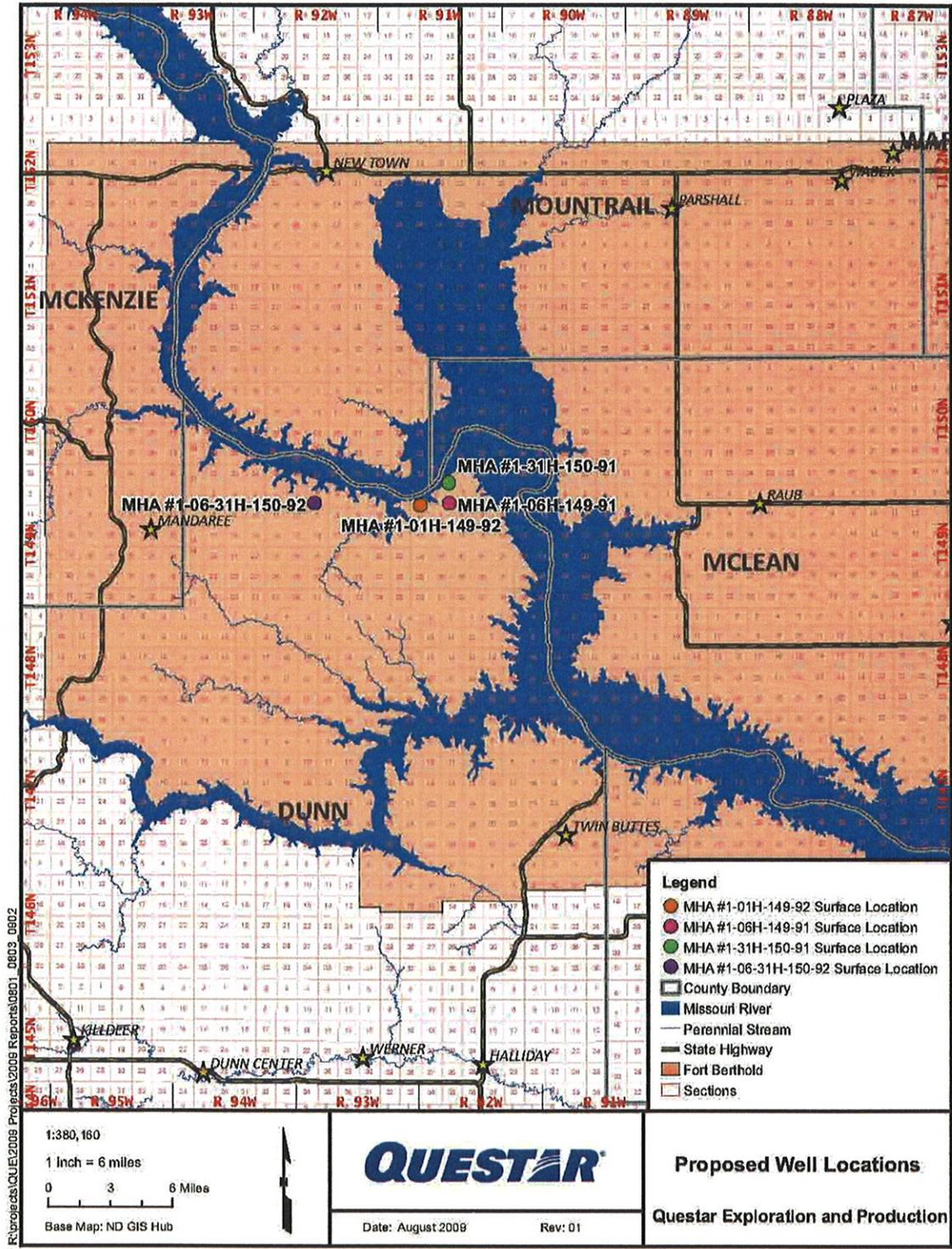
An environmental assessment (EA) determined that proposed activities will not cause significant impacts to the human environment. An environmental impact statement is not required. Contact Howard Bemer, Superintendent at 701-627-4707 for more information and/or copies of the EA and the Finding of No 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 November 9, by contacting:

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

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

Project locations.



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